DREDGE MANAGEMENT PLAN

Prepared by

Heron Construction Company Limited

Client:

Hawkes Bay Regional Council

20.013 Dredge Management Plan_Rev A
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ARRIVE SAFE
HOME SAFE
HERON SAFE

Revision History

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Section of Document	Change Made

All changes to this document must be recorded in the above table and approved by Management

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1 Introduction and Scope

This Dredge Management Plan (DMP) has been developed to detail the requirements for the Clive River 2021 Dredging Campaign to be conducted by the Heron Construction Company Ltd. The CSD Beaver and associated dredge spread and Workboat Buka will be utilised for the dredging works.

1.1 Project Description

The Clive Rive river is scheduled to be dredged every ten years depending on the silt build up to remove sediment in the lower reaches of the river, increase water depth and maintain channel capacity, while enhancing the recreational use of the Clive River.

Clive River was first dredged in 1997, during which time the volume of silt extracted was 66,000m3. The second dredging was undertaken in 2009 whereby 55,000m3 was removed. HBRC proposes to dredge the river once again in February 2021 with an expected volume of 60,000m3.

The dredging length is the lower reach of the Clive River, as marked in blue (Figure 1).

On both previous occasions the dredging methodology was to discharge silt to the coastline, as marked in yellow (Figure 1).

Discharge to land was considered during the planning stages of the 2009 and 2021 dredge campaigns, however it was not possible to secure suitable land close enough to the dredging location. Therefore, the same coastal discharge methodology as per 1997 and 2009 was adopted.

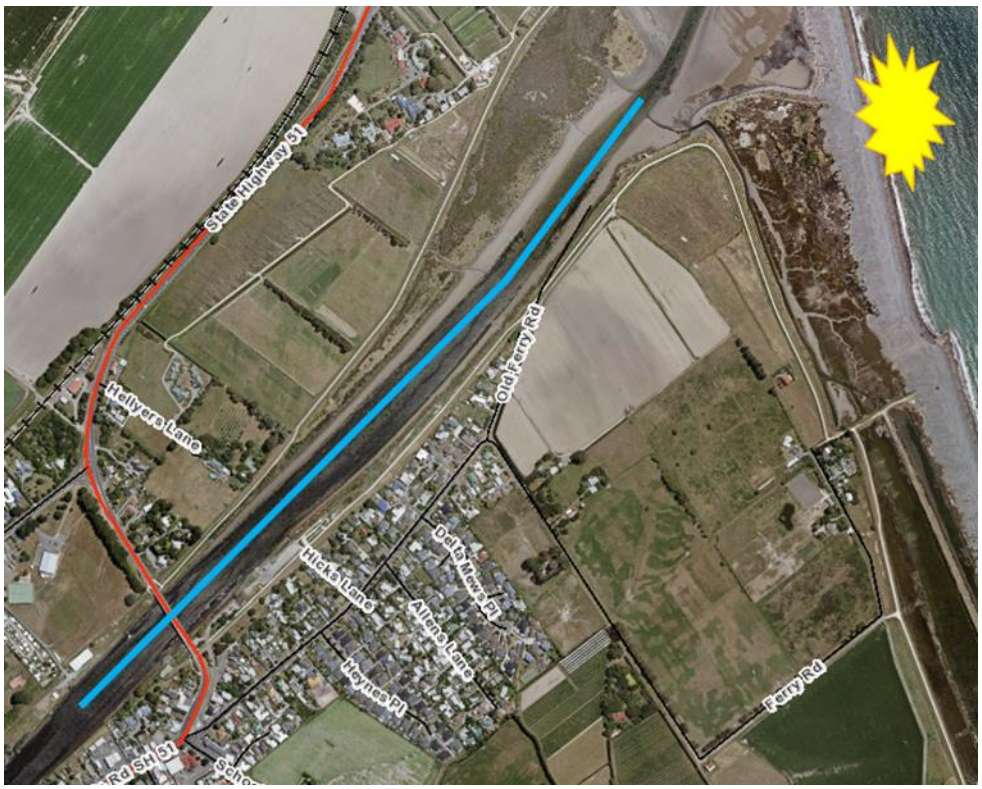


Figure 1 Dredging Extents and Historical Coastal Discharge

1.2 Purpose and Scope of this Plan

Heron recognises that dredging activities may introduce environmental challenges. Within our scope Heron commits itself to effective management of these impacts; aiming to reduce any negative effects that could possibly arise. This is achieved through a system of planning and communication; involving client parties, sub-contractors (if applicable) and project personnel.

This management plan for Dredging Works covers the strategies, systems and methodologies to be utilised for the Clive River 2021 Dredging Campaign.

1.3 Interface with other Plans

This DMP has been developed in conjunction with the:

- Health & Safety Manual (HSM) and Environmental Management Manual (EMM)
- Survey Management Plan (SMP) included in section 10
- Environmental Management Plan (EMP) included in section 12

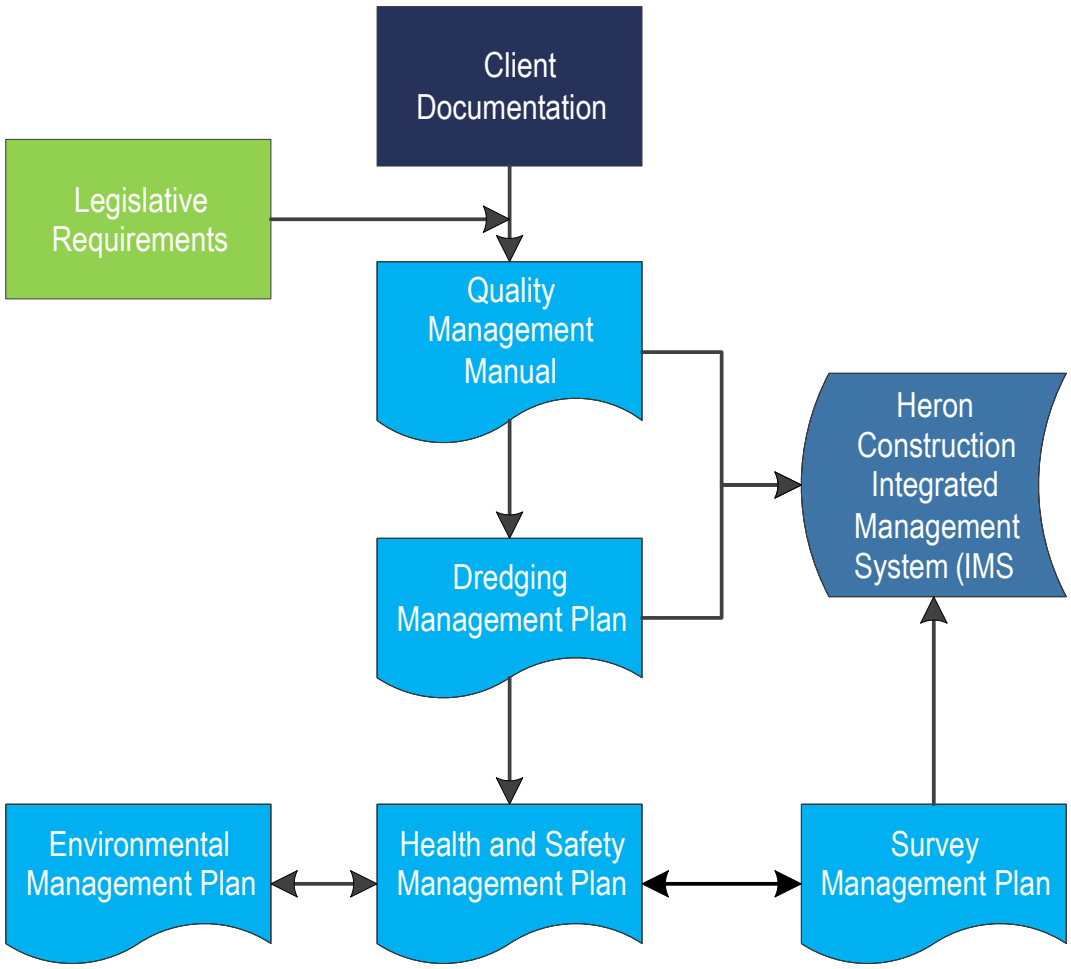


Figure 2 Project Documentation Interface

1.4 Abbreviations/Interpretations

Abbreviation / Interpretation	Complete Wording
CAD	Computer Aided Design
DMP	Dredge Management Plan
EMP	Environmental Management Plan
ERP	Emergency Response Plan

Abbreviation / Interpretation	Complete Wording
GPS	Global Positioning System
Heron	Heron Construction Company Limited
HSMP	Health & Safety Management Plan
IMS	Integrated Management System
JSEA	Job Safety and Environmental Analysis
M3	Cubic Metres
QC	Quality Control
QMM	Quality Management Manual
SWMS	Safe Work Method Statement
The Client	Downer HEB JV (Memorial Alliance)

1.5 Plan Distribution and Review

The Heron HSEQ Manager or delegate is responsible for the distribution of the Plan. The Plan will be introduced to Dredging staff and the workforce through general introductions to the management systems throughout project inductions.

A controlled copy of the Plan will be maintained in via the IMS, the web based document control system used by Heron. Once copies are downloaded, these copies will be deemed as uncontrolled.

A controlled copy of the Plan, as well as future updates, will be provided to the Client.

The Plan may be updated and revised when necessary as a result of any change in equipment, systems or procedures in performing the works, or when directed by the client.

Update and revision of the Plan may be required in the event that the Plan:

- Does not adequately address the matters it is intended to address;
- Causes non-conformity or does not comply with documentation;
- Has to be changed because of an audit;
- No longer represents current or best practice;
- Requires change due to feedback received through the designated monitoring mechanisms;
- Following the release of relevant environmental alerts, bulletins or guidelines from Regulatory Authorities and industry;
- Is otherwise required to be updated by client

1.6 Continual Improvement

During the term of the contract, relevant changes in technology and work methods will be examined for opportunities to improve Heron's processes and systems for the benefit of Project stakeholders.

The Operations Manager or delegate will be reportable to Clients representative to ensure continual improvement in all aspects of the Clive River 2021 Dredging Campaign, commissioning and completion of the contract, including the ongoing development of all project management documentation associated with Clive River 2021 Dredging Campaign Project.

2 Legislation, Policy and Other Requirements

2.1 Key Environmental Legislation

Heron will ensure compliance with all relevant legislation and aim to employ best practice environmental management procedures for the period of the Program. Key environmental legislation for the management of the Program can be found in Table 1.

Table 1: Applicable Environmental Legislation

Legislation	Application to Project	Administering Authority
MARPOL	International Standard for Marine Pollution Prevention	IMO
The Maritime Transport Act 1994	Prevention, Response, Dumping, Insurances	MNZ
Marine Protection (offences) Regulations 1998	Prevention, Response, Dumping, Insurances	MNZ
Resource Management (Marine Pollution) Regulations 1998	Prevention, Response, Dumping, Insurances	MNZ

2.2 Key Maritime Legislation

Heron will ensure compliance with all relevant legislation and aim to employ best practice management procedures for the period of the Program. Key Maritime legislation for the management of the Program is outlined in Table 2.

Table 2: Applicable Maritime Legislation

Legislation	Application to the project	Administering Authority
International Ship and Port Facility Security Code	Marine Works Security of Port Facilities	IMO
International Safety Management Code 2010 (ISM)	Vessel Safety Management System	IMO
Health and Safety at Work Act 2015	Vessel Related Safety	Ministry of Business, Innovation, and Employment
Maritime Transport Act 1994	Vessel Related Safety	MNZ
SOLAS	General Maritime Safety	IMO

2.3 Guidelines/Codes of Practice

Heron will ensure compliance with all relevant Guidelines/Codes and aim to employ best practice management procedures during the Dredging and Disposal phase of the Program. Key Guidelines/Codes for the management of the Program are outlined in Table 3.

Table 3: Applicable Maritime Guidelines/Codes

Document	Application to the project	Administering Authority
Code of Safe Working Practice for Merchant Seafarers 2007	Safety on New Zealand registered SOLAS ships	MNZ
Code of Practice for Health & Safety in Port Operations	Health & Safety in Port	MNZ / WorkSafe New Zealand
MOSS	Safe Ship Management	MNZ
New Zealand Port & Harbour Marine Safety Code 2004	Marine Safety – Ports and Harbours	MNZ
Craft Risk Management Standard for Biofouling on Vessels Arriving to New Zealand' 2014	Invasive Marine Species Management	MNZ

2.4 Project Specific Documents

Heron will ensure compliance with all relevant project specific documents and aim to employ best practice management procedures during each phase of the Program. Key project documentation for the management of the Program is outlined in Table 4.

Table 4: Applicable Project Specific Documents

Document	Application to the project	Owner
Health & Safety Manual(HSM)	Health & Safety Management	Heron Construction
Quality Management Manual (QMM)	Quality Management	Heron Construction
Environmental Management Manual (EMM)	Environmental Management	Heron Construction
Survey Management Plan (SMP)	Survey Management	Heron Construction
Environmental Management Plan (EMP)	Environmental Management	Heron Construction
Dredge Management Plan	Dredge Management (overarching)	Heron Construction

3 Roles and Responsibilities

Heron Construction responsibilities of providing a safe working environment lay with all personnel within the organisation and involves all personnel detailed below in ensuring risks are managed to ALARP.

3.1 Managing Directors

The Managing Directors have the overall responsibility to ensure all OHS Resources are nominated and allocated for operations, resources to consider include: human resources, financial resources and technical resources. Heron will ensure regular communication and support between the Managing Directors & General Manager and

other managers within the management team. The Managing Directors will lead by example with regard to safety practices by promoting and supporting all facets of promoting Health & Safety within the workplace.

- Provide the necessary resources to ensure H&S is a leading factor in everyday operations
- Manage Health & Safety issues throughout all levels of the organisation

3.2 General Manager

The General Manager in conjunction with senior management take overall responsibility for the safe operations of Heron Construction project works, however it is essential that all personnel within the structure of the organisation understand their general duties and responsibilities and resource availability. The General Manager is directly responsible to the Managing Directors.

- Provide resources for selection and supply of safety equipment (PPE)
- Authorise or delegate HSE documentation
- Develop and implement procedures
- Provide a Return to Work program
- Provide an injury and incident reporting system
- Overall responsibility for contracts
- Provide for health & safety essentials in the contract
- Communicate Health & Safety provisions included in the contract
- Authorise and control document review / alteration
- Quality Assurance Management
- Discipline and Grievance Management Act on injury and incident reports

3.3 Contracts Manager

The Contracts Manager is responsible for the safe execution, planning, organising and coordination for Heron Construction dredging and marine construction projects. The Contracts Manager reports to the General Manager.

- Safe execution of the works
- Develop and implement procedures
- Overall responsibility for contracts
- Provide for Health & Safety essentials in the contract
- Communicate Health & Safety provisions included in the contract
- Quality Control and Compliance.
- Health and Safety Compliance.

3.4 Marine Superintendent

The Marine Superintendent's role is to ensure that vessels associated with Maintenance dredging are managed in accordance with survey and class requirements. In addition the Marine Superintendent is responsible for:

- Liaising with marine surveyors for class/survey management
- Ensuring vessel certificates are maintained as per class/survey requirements
- Reviewing and managing preventative maintenance
- Ensure Company owned and managed vessels are operated in a safe, efficient and economical manner and in full compliance with Class and Statutory regulations
- Liaising with Master and Chief Engineer with reference to Certification and safety equipment
- Monitor crew compliance with STCW and other training
- Ensure that the vessels Planned Maintenance System is being operated and reported in the manner prescribed in the company's Quality Systems Manual and Flag State.

- Preparing vessel repair specifications in association with the General Manager, Dredging Superintendent, Master and Chief Engineer
- Ensure the vessels carry the required publications, procedures, operation manuals and other documentation required by Flag State and other regulatory bodies and that these are kept up to date.
- Ensure all vessels are kept to a high standard.

3.5 Dredging Superintendents/Supervisors/Masters

The Dredging Superintendent/Supervisor/Master is responsible for the dredge spread. He is responsible for safety, pollution prevention and the efficient operation of the dredge spread. He may deviate from documented Dredging Procedures, if human life, property and/or the environment is at risk. The Dredging Superintendent/Supervisor/Master is directly responsible to the General Manager.

The Dredging Superintendent/Supervisor will:

- Oversee and enforce the correct utilisation of PPE and safety equipment
- Ensure procedures are followed
- Ensure adequate training resources are available
- Ensure machinery and equipment is safe and properly maintained
- Report all near misses and incidents to Management
- Act on safety problems in an appropriate and hastily manner
- Ensure work areas are maintained in a safe condition
- Lead and manage emergency procedures
- Ensure all employees are inducted onto dredge
- Report any safety concerns to the Safety Manager
- Lead by Example

3.6 HSE Manager

The Health, Safety and Environment Manager's main responsibility is to provide advice and assistance to all management staff for the development, implementation, review and revision of health, safety, environmental & quality programs. The HSEQ Manager ensures all the construction activities are appropriately evaluated to establish the correct level of risk associated to each of them and in consultation, General Manager and Dredge Superintendent recommends the appropriate controls to be implemented to ensure legal compliance with health and safety regulations. Responsibilities also include:

- Develop and implement HSE Procedures
- Manage reported near misses and incidents
- Act on safety issues in the appropriate manner
- Help manage emergency procedures
- Ensure documentation is reviewed and up to date
- Assist in the induction process
- Ensure relevant safety information is communicated
- Ensure consultation with work groups is established and maintained
- Review and monitor safety system as required
- Manage the Return to work program
- Provide adequate training resources

3.7 All personnel

All personnel are expected to:

- Wear provided and applicable safety equipment (PPE)
- Attend work fit for duty
- Follow and adhere to H&S procedures
- Communicate all H&S issues to supervisor or HSEQ Manager
- Use equipment as per SWMS and SOP's
- Report all injuries and near misses to supervisor or HSEQ Manager
- Report unsafe acts to supervisor or HSEQ Manager
- Adhere to return to work requirements
- Evacuate as per emergency requirements

3.8 Visitors

All visitors are expected to

- Be escorted by an Heron Construction representative at all times
- Report all incidents and hazards identified to Heron Construction Representative
- Must sign on and off the visitors log
- Wear applicable PPE

4 Induction

An Induction prior to commencement of dredging works shall be completed. The induction will include details of this Dredge Management Plan. The following inductions shall be completed by all personnel prior to the commencement of the Clive River 2021 Dredging Campaig, these will include:

- Heron Company Induction
- Vessel Familiarisation Induction

4.1 Training and Awareness

All personnel shall be suitably qualified and experienced to undertake their work in an environmentally responsible manner. Personnel who have formal responsibilities under this plan will be trained in the requirements of this Dredge Management Plan.

Training may include formal courses, tool box meetings. Records of training and inductions will be maintained.

Training requirements will include relevant personnel to be trained in spotting and identification of cetaceans (whales, dolphins) and marine pollution and response.

All personnel will be required to complete an assessment to demonstrate an understanding of key issues, requirements and responsibilities.

Induction topics will include, but are not limited to, the following:

- Environmental Policy
- Health & safety Requirements
- Key environmental issues and controls
- Environmental monitoring programs
- Emergency response
- Incident reporting
- Waste management
- Responsibilities
- Communication requirements
- Vessel specific requirements

4.2 Job Specific Training

Different roles require specialised training and certification. Examples may include:

- Confined Space
- Fire Fighting
- Working at height
- Dogging/Rigging
- First Aid

Training of this nature may be conducted by an independent registered training organisation (RTO) to ensure the appropriate education and regulatory requirements are complied with.

4.3 Marine Competency

All crews shall be trained and deemed competent in accordance with regulatory bodies being Maritime New Zealand. The applicable employees may comply with the training requirements as stipulated under STCW or recognised Flag state.

Masters will be expected to hold a Certificate of Local Knowledge (if applicable) or complete the requirements and examination for the issue of these certificates.

All training evidence shall be documented and be made available to interested parties upon request.

Heron shall ensure that all personnel (including contractors and visitors) have undertaken training appropriate to the identified needs.
Training shall be carried out by persons with appropriate knowledge, skills, and experience in OHS and training, preferably an accredited training provider, where possible.

Each vessel's MOSS details the induction, briefing, and training requirements for that vessel, including vessel operation, radio procedures and emergency drills.

All personnel on the vessel should make themselves familiar with the vessel MOSS.

4.4 Dredge Operational Training

Heron shall ensure personnel are trained to a high standard throughout all levels of the organisation. All Heron personnel and sub-contractor personnel engaged in carrying out work shall have the necessary skills, knowledge and competence to perform the tasks for which they have been employed.

5 Communication

5.1 Internal Communication

Within the management team it is important to ensure that management techniques are being adhered to and that employees have the opportunity to address concerns. HSE communication will primarily be through Pre-Start Meetings, weekly team meetings and Tool Box Talks; however communications can also occur during site inspections or through members of the environmental or management teams.

Regular meetings will also be scheduled with Stakeholder representatives, Contractors and crew members where applicable. HSE matters will be included as a standard agenda item at these meetings.

5.2 Environmental Enquiries and Complaints Management

All complaints received by Heron shall be handled as follows:

Stakeholders to be notified as soon as practicable. The timeframe for further detailed response is dependent on the nature of the complaint and the scale of investigation required. It is expected that there will be management action within 24 hours of the initial assessment of the complaint. The following options for action may be taken:

- If the complaint is regarding a single event then no monitoring may be required if a cause cannot be determined.
- If there are a number of complaints relating to the same issue then monitoring will be considered as part of the investigation.

6 Incident/Accident Management

6.1 What is an Accident?

The Health & Safety at Work Act 2015 defines accident broadly, as any event that:

'causes any person to be harmed, or in different circumstances may have caused any person to be harmed.'

Maritime New Zealand interprets this in a maritime context as meaning:

Accidents include events such as any damage to a vessel, which may affect its strength or seaworthiness, groundings, collisions, machinery failures and steering loss.
Incidents include a near collision or a near grounding. If there is any doubt as to whether an incident should be reported, the best thing to do is to report it to Maritime New Zealand.

Serious harm injuries include, but are not limited to:

- Death
- Amputation of a body part
- Burns
- Loss of consciousness, and
- Any harm that causes a person to be hospitalised for a period of 48 hours or more.

6.2 What is a Notifiable Incident?

Under the Health & Safety at Work Act 2015, a **notifiable incident** means an unplanned or uncontrolled incident in relation to a workplace that exposes a worker or any other person to a serious risk to that person's health or safety arising from an immediate or imminent exposure to—

a) an escape, a spillage, or a leakage of a substance; or
b) an implosion, explosion, or fire; or
c) an escape of gas or steam; or
d) an escape of a pressurised substance; or
e) an electric shock; or
f) the fall or release from a height of any plant, substance, or thing; or
g) the collapse, overturning, failure, or malfunction of, or damage to, any plant that is required to be authorised for use in accordance with regulations; or
h) the collapse or partial collapse of a structure; or
i) the collapse or failure of an excavation or any shoring supporting an excavation; or
j) the inrush of water, mud, or gas in workings in an underground excavation or tunnel; or
k) the interruption of the main system of ventilation in an underground excavation or tunnel; or
l) a collision between 2 vessels, a vessel capsize, or the inrush of water into a vessel; or
m) any other incident declared by regulations to be a notifiable incident for the purposes of this section.

6.3 Reporting and Recording

The skipper of a vessel must notify all accidents resulting in the death of, or serious harm to, a person, or any other accident or incident, to Maritime NZ as soon as practicable. The notification must be followed up by a written report within seven days.

The words as soon as practicable mean as soon as possible in the circumstances. After ensuring that the vessel, crew and passengers are not in immediate danger, reporting an accident, incident or mishap to Maritime NZ should be the skipper's first priority.

The MT Act (Section 30) requires employers of seafarers on a new vessel to maintain a register of accidents, incidents and mishaps, and to record particulars relating to those events. The Act requires employers, the self-

employed and principals to maintain a register of accidents and serious harm. The same register can meet both requirements.

Minor injuries, such as a small cut or sprain, do not have to be reported to Maritime NZ but should still be recorded on the accident register.

6.4 Incident Investigation

Significant incidents shall be investigated and the causes determined and reported. The HSE Manager will liaise with the Management to ensure that resources are available to conduct any investigation required. The detail of a report can vary dependent of the severity of the incident but fundamentally the following areas should be addressed:

- **Who?** Record the names of everyone involved.
- **What?** Look at the work area and equipment involved, check for defects, get an exact description of chemicals involved, etc. Gather documented information, Risk Assessments; JSEA s and work instructions or procedures.
- **Where?** Describe the exact location, note all relevant facts, i.e. lighting, weather, sea conditions. Take photographs where possible.
- **When?** Note exact time, date and other factors, i.e. shift change, work cycle, break period, etc.
- **How?** Describe usual sequence of events and actual sequence of events before, during and after the incident.
- **Why?** Find all possible immediate and root causes AND how to keep it from happening again.

All incidents shall be recorded on Incident Record Form and investigated via the online investigation system which is based on root cause analysis.
All incident information shall be maintained for a period of 5 years.

6.5 Corrective Actions

Corrective actions may be generated from a number of sources, including but not limited to incidents, audits, inspections and management reviews. Corrective actions will be systematically managed to ensure issues raised are recorded and closed.

A Corrective Actions Register for recording all corrective actions raised and closeout details, will be maintained on site. The close out details will include the date closed and the name of the person verifying completion of the required action.

7 Plant & Equipment Functionality

The dredging spread proposed for the Clive River 2021 Dredging Campaign is as follows:

- Cutter Suction Dredge 'Beaver'
- Booster station
- Workboat / Dredge tender 'Buka' or 'Rua'
- Palfinger anchor handling crane barge
- 20 t Excavator
- 1704m steel 14" pipeline
- 144m 14" floating pipeline

7.1 Cutter Suction Dredge 'Beaver'

The Beaver (see Appendix A for Specification Sheet) will undertake all dredging operations on the Clive River 2021 Dredging Campaign. Beaver is a cuttersuction dredger what is non propelled barge/vessel that uses a rotating cutter head to loosen the material in the seabed and sucks up the loosened material and pump it through pipelines to a discharge location. The cutter suction dredger 'swings' from left to right and back by using 'side' anchors and is fixed to the seabed by a 'spud' and the back of the dredge. By using the side anchors the 'working foot print' will be full width of the river 50m in front and 50m behind the dredge.

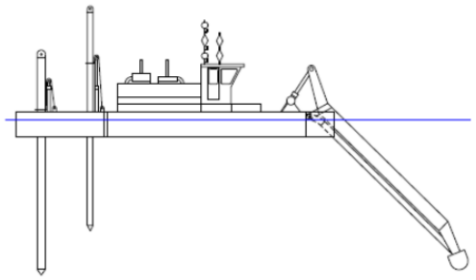


Figure 3 Pipeline route working area

Beaver will be assisted by a booster station to deal with the distance the material needs to be pumped. The booster station will be installed on a small barge direct behind the dredger.

A workboat will assist the dredger with moving around the work area and during the dredging operations by shifting the anchors. The shifting of the anchors will be carried out by a 'palfinger' crane installed on a small pontoon. The workboat will manoeuvre the crane pontoon.

7.1.1 Dredging Control

A basic positioning system will be installed to monitor the location where the dredger has been. The positioning system will allow the operator to dredge accurately the required profile to dredge. Hydrographic survey data in the form of 'DXF' files can be downloaded into the dredging monitor. These files can show details as beacons, foreshore, wharves, and the extent of dredge areas, pre-dredge seabed contours and most importantly the position of the Beaver relative to the features.

7.1.2 Dredge Profile

A dredge profile is the design model for the dredge to target. Dredge profiles can be designed using a CAD package, then imported into Dredge computer as a DXF (Drawing Exchange Format) file. Due to the ability to utilise CAD, these profiles can be made to be as complex as the design surface requires.

7.2 Buka / Rua - Workboat

The Buka is a 7.3m long and 3 m wide workboat (See Appendix 2 for Specifications). Rua is her slightly bigger sister vessel.

7.3 Transfer of Personnel

A Safe Work Method Statement is in place to ensure the transfer of crew is conducted in a manner that minimises risk to As Low as Reasonably Practicable (ALARP).

8 Dredge Management Systems

8.1 Method and Precision for Matrix Establishment and Maintenance

Before dredging commences, Heron will conduct, if required, a pre-dredge (multibeam survey) of the dredge area, this may be witnessed by the Client if required. This will establish the matrix which will be presented in real time on the dredge screens on board the dredger

8.2 Data Availability

The advantage of supporting the dredging operation with a survey system is that this data can be processed on board the survey vessel and within a few hours a fresh survey can be emailed and uploaded to the matrix on board the dredger. The dredge system allows the update of the matrix to be uploaded while the dredger is still working, so there is no need to stop the operation for survey updates.

8.3 Real Time Logging

The Dredge Monitoring Program enables data to be logged at high rates and high volumes. Useful data that is typically logged and stored on a dredging project are the x,y coordinates of the cutting head during dredging, and the position tracks of the vessel during dredging. Track plots can then be presented to the client as either Ascii files, or as track plots.

9 Dredging Sequence

9.1 Mobilisation

All equipment needed for the project (ref section7) will be mobilised by road. It is the intention to lift all the waterbased equipment (Beaver, Buka/Rua, crane pontoon and floating pipeline) onto the water at the Evers Swindell Reserve carpark. A locally hired mobile crane will be used for this.

The 1704m of steel pipeline comes in lengths of 12m i.e. 142 pipes will be installed along the southern riverbank. The flanged pipes will be bolted together. The 20t excavator will be used to handle pipes during the installation. At its maximum length the pipeline will stretch from the SH51 bridge to the discharge point on the beach.

The map below indicates the pipe route working area required.

Figure 4 Pipeline route working area

9.2 Dredging Area

The dredge area extends form the rowing club house to where the Clive river joins the Ngaruroro and Tutaekuri rivers as per the figure below.

Figure 5 Dredge area

It is the intension to start dredging to the south of the SH51 bridge. The dredger's anchors will be installed using the workboat and crane pontoon to position the anchors as close to the river bank either side. It should be noted that the anchor wires and the dredge will take up thr full width of the river. It is possible to pass the dredge but

permission must be given by the dredge master so he can drop the anchor wire for safe passage. The restriction to how much we can dredge, discharging to the same shore connection is defined by the length of floating pipeline behind the dredge. Every time we move the shore connection the pipeline length shortens towards the sea. This will be done in approx. 300m increments. The figure below shows the red dots of approximate location of shore connections. There will be 5 or 6 shore connections. Once a new shore connection is establish by 'breaking' into the pipeline the pipes not in use anymore will be either kept in place or collected and stored at a safe to place (to be confirmed).

Figure 6 Shore connection points

10 Weather and Sea Conditions

10.1 Weather Predictions

Unless reliable local weather forecast is available, Heron shall commission Met Ocean Solutions in New Zealand to provide daily weather reports and 7 day forecasting, these forecasts will predict wind speed and direction, wave eight, period and direction, sea height, tide time for a seven day period (Figure 16).

This information assists greatly in the planning of which areas to dredge, times that dredging cannot occur due to sea conditions and when the required maintenance can be carried out. This information has also been invaluable to help predict extreme weather situations. Heron will commission Met Ocean Solutions to provide meteorological and oceanographic forecasting for the duration of the contract works.

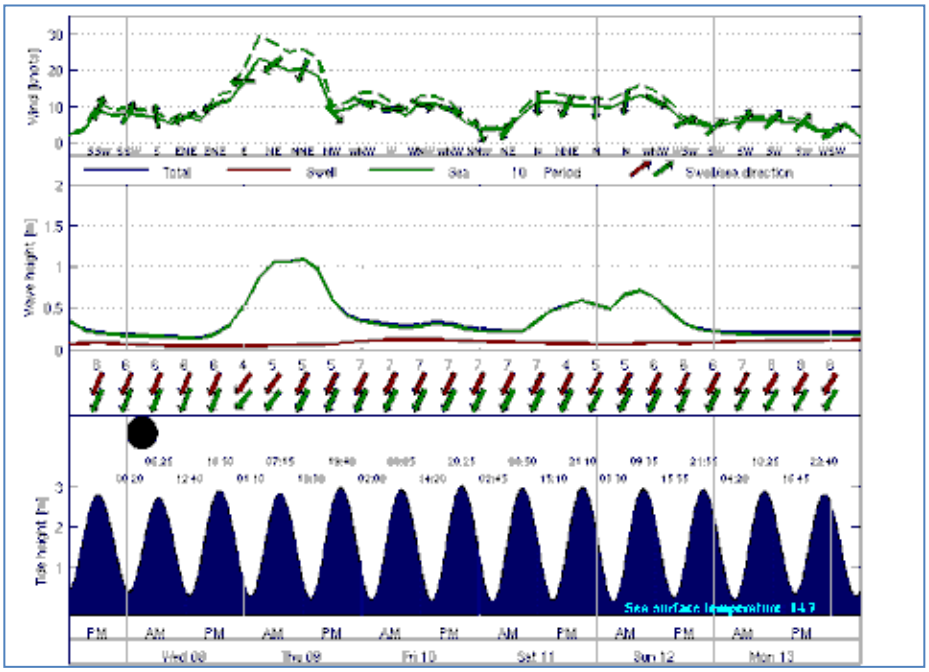


Figure 7 Format for Weather forecasting as supplied by MetOcean Solutions

10.2 Weather Contingencies

If the weather conditions or forecast become too dangerous or fall outside the safe operating capabilities of the marine vessels and/or plant & equipment, these will be relocated to an area that will provide temporary cover from the weather. Consultation with the Harbour Master and other stakeholders will occur in the event that work has stopped due to inclement and unworkable weather conditions.

11 Health Safety and Environment Control Provisions

11.1 Water and Sediment Control

Although dredging works are not expected to generate high levels of turbidity which pose a risk to the marine environment, the controls detailed below have been incorporated to minimise impact on water quality.

Element	Water and Sediment Quality	
Performance Objective	• To prevent the pollution of water and minimise turbidity extent. • To minimise the environmental impact of any spills.	Responsible Person(s)
Management Actions	▪ Dredging activities will be restricted to locations and depths shown as per dredging specifications	Dredging Superintendent
	▪ An accurate positioning system (e.g. DGPS) will be used on the dredger to ensure direct impacts are restricted to the approved dredging, reuse and disposal areas and to minimise over-dredging.	Dredging Superintendent
	▪ Preventative Maintenance Schedule in place which includes periodic checks	Dredge Superintendent
	▪ All dredging activities will be conducted using equipment in good working order that has a stringent preventative maintenance program in place.	Dredge Superintendent
	▪ Heron will ensure its activities conform to the requirements of the MARPOL Convention, with regard to the statutory controls placed on ships to prevent marine pollution.	Dredging Superintendent
	▪ Heron will be familiar with and adhere to the applicable Port of Emergency Spill Response requirements	HSEQ Manager / Dredge Superintendent
	▪ Heron shall ensure vessel pollution drills are carried out as per the vessel MOSS and legislative requirements.	HSEQ Manager / Dredge Superintendent
	▪ Appropriate spill kits will be available on-board the vessels as per class/survey requirements	HSEQ Manager / Dredge Superintendent
	▪ Spill kits will be tailored to the type and volume of potential spills and will include, as a minimum: • Absorbent pads. • Spill containment booms. • Personal protective equipment. • Contaminated waste bags and ties. • Instruction sheets	HSEQ Manager / Dredge Superintendent
	▪ In the event of a spill, Heron will undertake all relevant actions to stop the spill at its source, minimise and contain the spill as soon as possible.	Dredge Superintendent
	▪ Spilt material will be recovered, where possible, and contaminated spill recovery materials will be collected and disposed of at an appropriate licensed facility.	Dredge Superintendent
	▪ In the event of a spill, incident or emergency, dredging activities in the immediate area will cease immediately	Dredge Superintendent
	▪ In the event of a spill, incident or emergency, emergency services (111) or Harbour Control will be contacted immediately.	Dredge Superintendent
	▪ No ballast water or sediments from ballast tanks will be discharged in to waterways as required by legislation	Dredge superintendent / Vessel Master
	▪ In the event of a spill, accident or emergency situation, Heron will undertake any relevant required repairs and modify their working methods as appropriate.	Dredge Superintendent

Element	Water and Sediment Quality	
	▪ All personnel shall be inducted and trained in the controls related to water and sediment quality	HSEQ Manager
Monitoring	▪ Heron will carry out regular inspections of its work areas.	HSEQ Manager
	▪ Heron shall document fuel and water usage and be available to stakeholders upon request.	Administration Manager
Reporting	▪ Heron will prepare an incident investigation report for significant incidents as per the MNZ Reporting requirements.	HSEQ Manager
	▪ Heron will report all relevant complaints, spills and incidents to the MNZ as soon as practicable	HSEQ Manager

11.2 Marine Traffic

Element	Marine Traffic	
Performance Objective	• To minimise traffic interactions and appropriately manage traffic interfaces and remain within the dredging zones	Responsible Person(s)
Management Actions	▪ Any off-water incidents will be managed as per current established operating procedures	HSEQ Manager
	▪ Movement of vessels shall be in accordance with Harbour Masters directions and Harbour Control communications	Dredging Superintendent / Vessel Master
	▪ All shipping required for the dredging program will comply with the safety and management policies of the port, including implementation of general navigational safety controls to ensure no risks to any other users of the area.	Dredge Superintendent / Vessel Master
	▪ Masters shall be made aware of the Traffic Management Plan, if applicable, and minimising the utilisation of the shipping channel areas	Dredge Superintendent / Vessel Master
	▪ Masters shall be aware of the logging requirements with Harbour Controls	Vessel Master
	▪ Communication with the Harbour Master/Port throughout the dredging works to communicate its intended shipping schedules, movements, timings and pilotage requirement	Dredge superintendent / Vessel Master
	▪ All Masters shall hold the applicable competencies and local knowledge as required by the Harbour Master/Harbour Control	Dredging Superintendent
	▪ All ships used for the dredging works will hold current survey certificates in accordance with their class and function.	Dredging Superintendent
	▪ All ship crew will be fully qualified and trained for their respective roles.	Vessel Master
	▪ All ships will be operated in full accordance with international, New Zealand and local navigational safety and environmental protection standards and regulations.	Dredging Superintendent
	▪ This Dredge Management Plan has been developed to manage dredging operations	Dredging Superintendent
	▪ All applicable vessels will have an on-board Ship-Oil Pollution Emergency Plan (SOPEP) or equivalent applicable to their class.	Dredging Superintendent
	▪ Ships will be lit at night in accordance with safety navigation requirements.	Dredge superintendent / Vessel Master

Element	Marine Traffic	
Performance Indicators	▪ No collisions caused by Project dredging vessels.	Dredging Superintendent
	▪ Harbour Master provided with advance copies of all dredging related shipping schedules.	Dredge superintendent / Vessel Master
	▪ No breaches of the Dredge Management Plan	Dredging Superintendent
Monitoring	▪ Compliance monitoring with the management and interfacing requirements with shipping and the port operations.	Dredging Superintendent
Reporting	▪ Collisions or near misses will be reported in accordance with incident reporting procedures	HSEQ Manager
Corrective Action	▪ Collisions will be managed in accordance with incident management procedures	HSEQ Manager

11.3 Waste

Element	Waste	
Performance Objective	• To minimise the wastes generated and resources used throughout the life of the dredging works, and maximise opportunities for reduction, reuse and recycling. • To store, handle, transport, and employ resources/dispose of waste in a manner that does not lead to environmental harm, pollution or contamination.	Responsible Person(s)
Management Actions	▪ Adherence to the Garbage Management Plan. All waste management and disposal will be carried out in accordance with legislative requirements and relevant guidelines, with consideration for the waste management hierarchy.	Dredge superintendent / Vessel Master
	▪ Resource use and waste generation will be minimised and all waste will be reused, recycled or disposed of in accordance with best practice and relevant legislation	Dredge superintendent / Vessel Master
	▪ The following waste hierarchy will be implemented: • Avoid waste by identifying appropriate materials and effective procurement • Reduction of waste by optimising dredging and operation methods • Reuse waste by identifying sources that can utilise the waste • Recycle waste by identifying facilities that are able to recycle waste • Recover energy from waste • Dispose of waste at an appropriate licensed facility	Dredge superintendent / Vessel Master
	▪ The discharge of any solid waste overboard is prohibited.	Dredge superintendent / Vessel Master
	▪ Metal off cuts that can't be re-used shall be taken away as scrap for recycling.	Dredge Superintendent
	▪ Recycling bin available on board.	Dredge Superintendent
	▪ Hazardous waste bin available on board to ensure segregation of other recyclable waste.	Dredge Superintendent
	▪ The burning of waste is prohibited.	Dredge superintendent / Vessel Master

Element	Waste	
	▪ Heron will ensure appropriate waste containers are available on its vessels for the segregation and storage of wastes, including for ship-generated waste, in accordance with applicable legislation.	Dredge superintendent / Vessel Master
	▪ All waste containers will have secure lids in place to prevent water ingress and access to animals.	Dredge superintendent / Vessel Master
	Masters are responsible for all handling of waste on board and shall manage the use and disposal of all garbage/waste generated on board correctly, which includes but is not limited to: • food/galley waste • paper/cardboard/recyclable products • paints / oil products / oily rags • glass / bottles • metal products • plastics	Dredging Superintendent
	▪ No bilge water or sediments from tanks will be discharged to the environment unless legislation allows.	Dredge Superintendent / Vessel Master
	▪ Waste oil, solvents and toxic material will be collected in appropriate, labelled containers for reuse, recycling, treatment or disposal at approved licensed locations.	Dredge Superintendent / Vessel Master
	▪ Environmental issues and impacts, including resource use and waste management, will be considered when procuring subcontractors and suppliers.	Dredging Superintendent
	▪ Environmental requirements will be included in procurement and subcontract documentation through the contract and scope of works.	HSEQ Manager
	▪ All grey water and sewage from the dredge shall be managed as per legislative requirements	Dredge Superintendent Vessel Master
Performance Indicators	▪ No litter present on deck areas or in the water.	Dredge Superintendent / Vessel Master
	▪ Appropriate segregation of recyclable material from general waste.	Dredge Superintendent / Vessel Master
	▪ No discharge of bilge water, ballast water, sediments or sewage from tanks.	Dredge Superintendent / Vessel Master
	▪ Heron will carry out weekly inspections of its works areas to ensure wastes, chemicals and hazardous materials are appropriately stored and required procedures are being implemented.	HSEQ Manager
Corrective Action	▪ Any spills will be managed in accordance with the requirements set out in Section 12.1	Dredge Superintendent / Vessel Master

11.4 Hazardous Substances

Element	Hazardous Substances	
Performance Objective	• To prevent the release of hazardous substances to the environment	Responsible Person(s)
Management Actions	▪ All fuel, hydraulic oils and other hazardous materials and wastes will be stored in secure, bunded areas.	Dredge Superintendent / Vessel Master
	▪ All storage and handling equipment for fuels, lubricants and chemicals will be maintained in good working condition.	Dredge Superintendent / Vessel Master
	▪ Bunded areas will be capable of containing 110% of the stored or handled volume.	Dredge Superintendent / Vessel Master
	▪ Precautions will be taken during any refuelling or oil transfer operations to avoid fuel or oil entering the marine environment.	Dredge Superintendent / Vessel Master
	▪ Safety Data Sheets (SDSs) will be maintained on site for all hazardous and potentially hazardous substances, including fuels and chemicals, in a readily accessible location.	HSEQ Manager
	▪ All ships and hydraulic equipment will be maintained in good condition with regular servicing and maintenance scheduled as part of the works.	Dredge Superintendent / Vessel Master
	▪ Heron have developed and maintains a Hazardous Materials Register to record the type and volume of hazardous materials stored on its vessels.	HSEQ Manager
	Storage and handling of chemicals in accordance with: ▪ International Ship Management (ISM) Code (applicable vessels)	HSEQ Manager
	▪ In the event of an emergency, hazardous materials will be contained and removed to bunded areas as far as practicable	Dredge Superintendent / Vessel Master
Performance Indicators	▪ No environmental incidents relating to hazardous substances.	HSEQ Manager
Monitoring	▪ A Hazardous Materials Register will be maintained to monitor volumes and types of hazardous substances on site.	HSEQ Manager
	▪ Visual inspections will be undertaken at least weekly for evidence of spills where hydrocarbons are stored or used.	HSEQ Manager
	▪ Visual inspections of hazardous substances storage areas on a monthly basis	HSEQ Manager
Reporting	▪ Inappropriate storage or handling of fuels, lubricants and chemicals will be reported	HSEQ Manager
	▪ All hazardous substances stored on site will be recorded on a Hazardous Materials Register, including their type and volume.	HSEQ Manager
Corrective Action	▪ Any spills will be managed in accordance with the requirements set out in Section 11.1 and Section 12.	Dredge Superintendent / Vessel Master

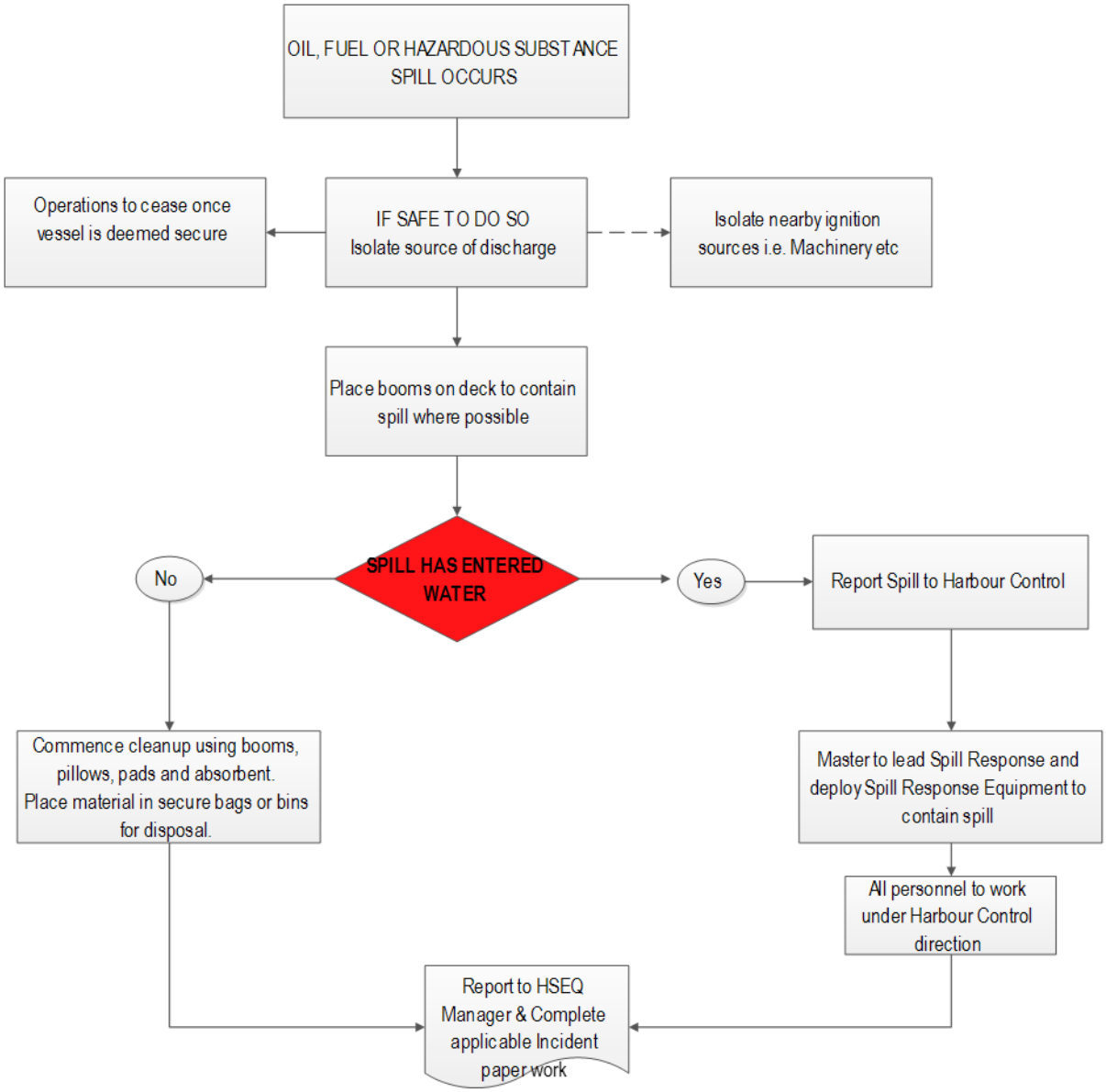
12 Emergency Response

Emergency situations that may occur on the Dredger and Workboat during dredging operations may include:

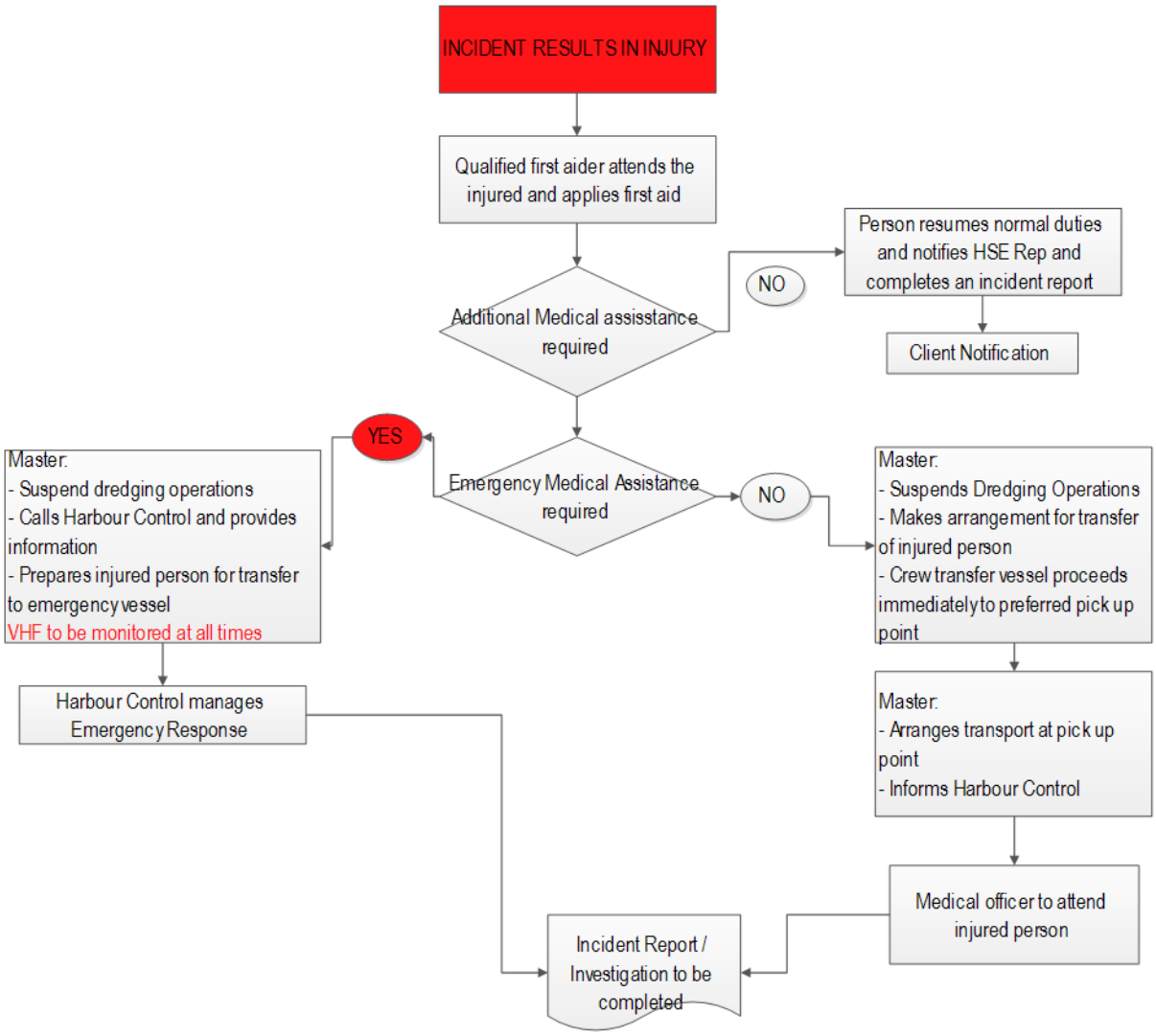
1) Environmental Release
2) Medical Emergency
3) Vessel Grounding
4) Fire Emergency Response
5) Person Over Board

The following flow charts detail the process to be followed in the case of the above emergencies prevailing.

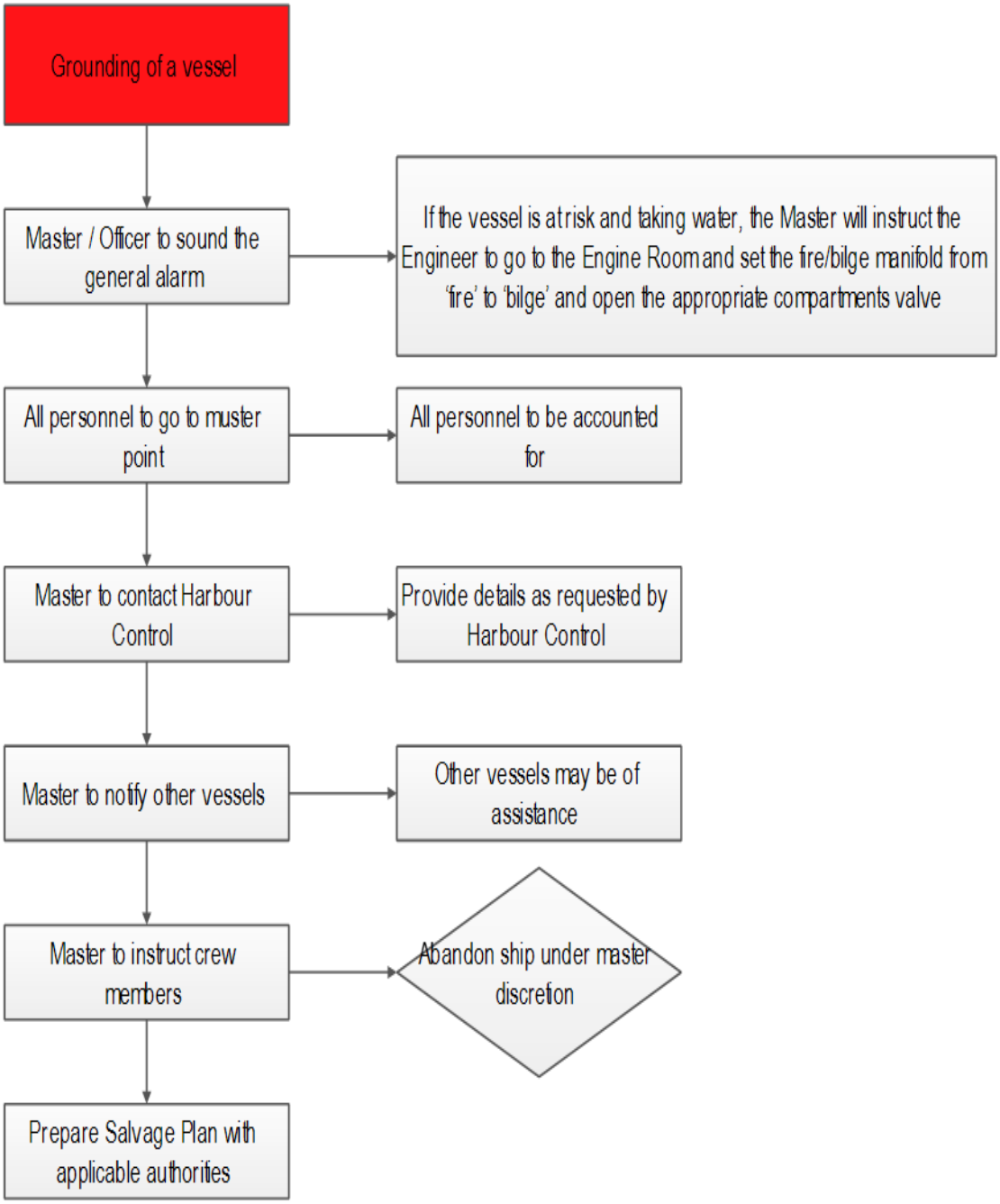
12.1 Environmental Release Flow Chart – On water



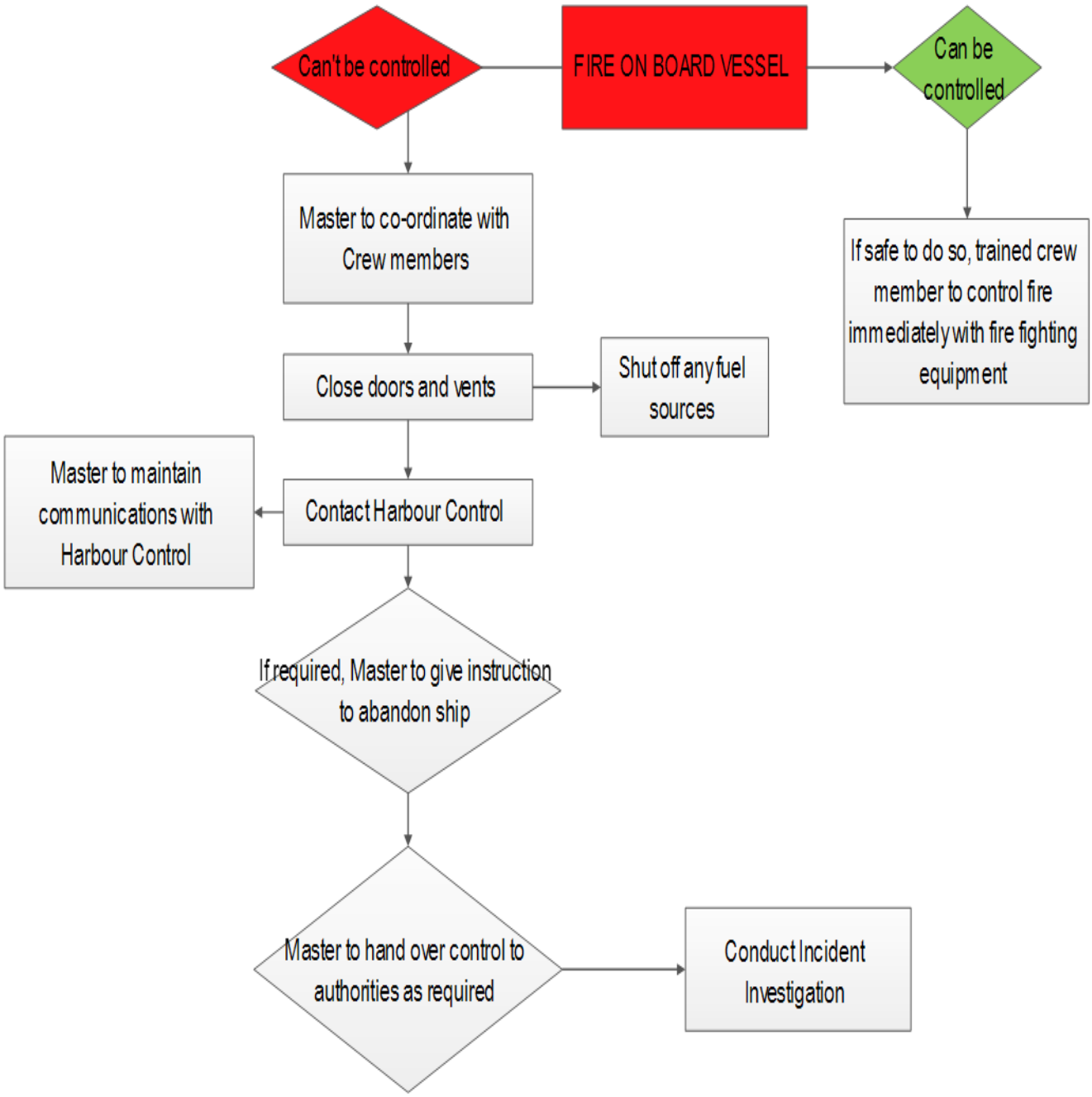
12.2 Medical Emergency Flow Chart



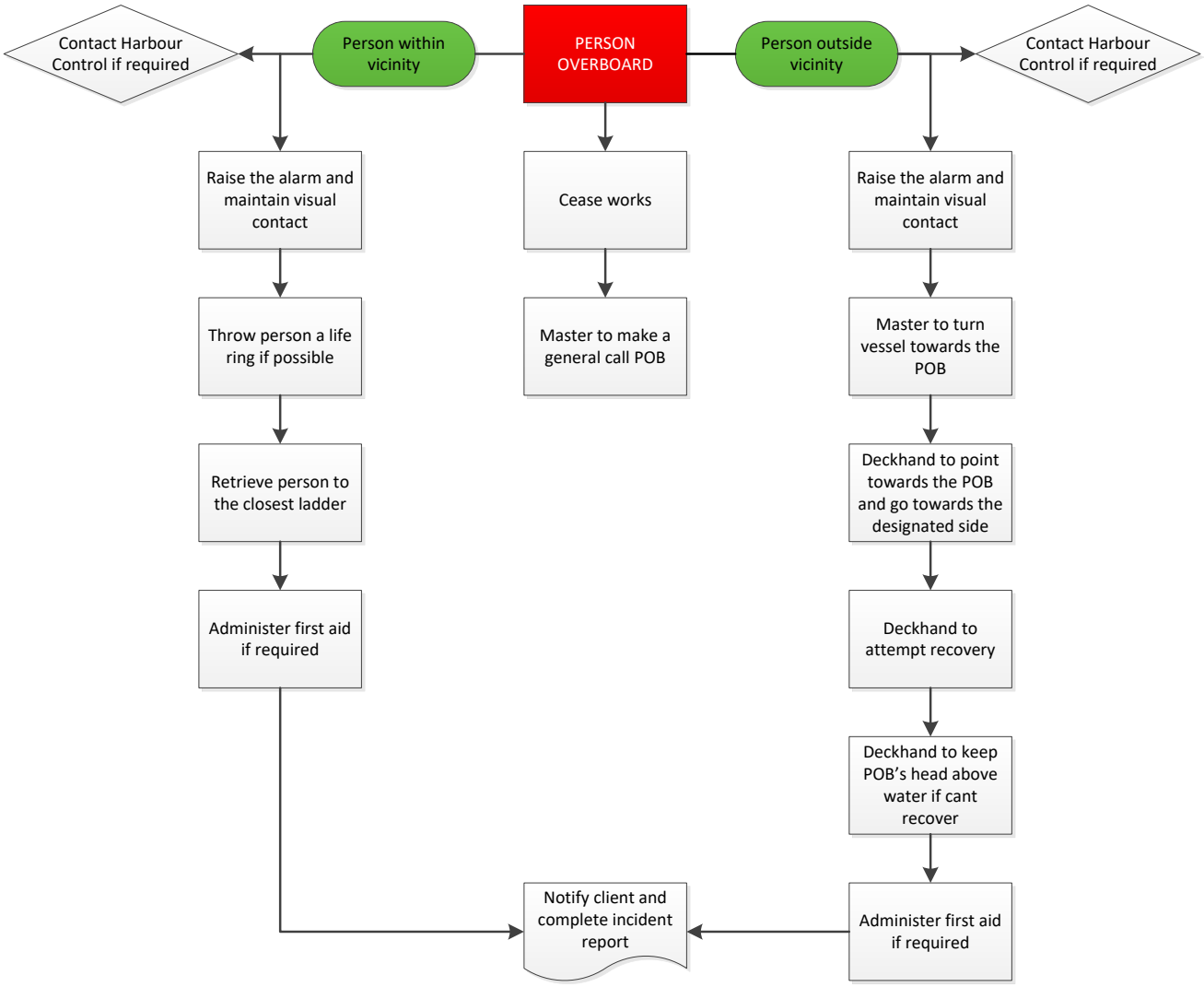
12.3 Vessel Grounding Flow Chart



12.4 Fire Emergency Response



12.5 Person Overboard (POB)

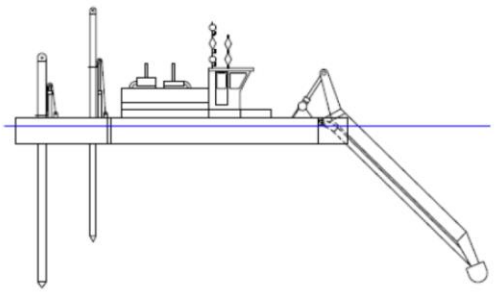


Appendix 1: CSD Beaver

BEAVER

Cutter Suction Dredge

Name:	Beaver
Type:	Cutter Suction Dredge
Operators:	Heron Construction Company Ltd
Length overall:	18 m
Breadth:	6 m
Draft:	0.9 m
Displacement:	45 tonne
Dredge Pump:	12/10 Warman Sand and Gravel
Suction Size:	300mm
Discharge Size:	350mm
Max Dredge Depth:	8m
Main Engine:	Cummins KTA19 M1 (525hp)
Auxiliary Engine:	Ford 2713E (120hp)
Cutter:	IHC 5 Blade RH
Spud Carrier:	2.5m stroke
Fuel capacity:	6000 litres
Hydraulic capacity:	1000 litres – Panolin hlp synth 46 bio-degradable hydraulic oil



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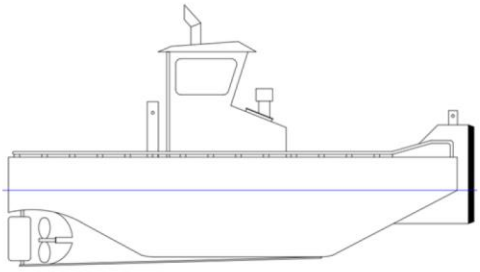
Appendix 2: Buka

BUKA

Workboat / Dredge Tender

Name:	Buka
Type:	Workboat / Dredge Tender
Official Number:	MNZ 123947
Class:	MOSS / Specified Limits
Operators:	Heron Construction Company Ltd
Displacement:	16 tonne
Length overall:	7.3m
Breadth:	3.0m
Draft:	1.0m
Fuel capacity:	6000 litres Fuel Transfer Capability
Main engine:	Cummins 6CTA.
Power:	255hp
Propulsion:	700mm dia 4 blade propeller
Bollard pull:	Approx 2.0 tonne
VHF radio:	ICOM IC M45



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