

Document Owner: Manager Customer Planning

## Reservoir ROV Cleaning

### Health & Safety and Operational Information

#### Hazard Indicators



#### Personal Protection



#### Health and Safety Information

- Generic Traffic Management Plans or site-specific Traffic Management plan.
- Shutdown Plan
- Risk Control Plan (RCP)
- Clarifier Outflow Plan
- Working at Heights
- Confined space

#### Operation's & Maintenance Documentation

- Corridor Access Requests (CAR) and WIP Permits (site specific or generic/global)
- Design drawings
- Site plans
- Reservoir design drawings indicating internal hazards (P&ID, internal layout & structure).

#### Customer Information (Confidential)

- Blow Back at risk customers (WWL)
- Vulnerable customers (DHB supplied list)
- Priority customers (WWL)

#### Priority Customer Categories

- Schools and Childcare
- Commercial premises
- Hospitals
- Retirement Homes/Villages
- Correction Facilities
- Military Installations
- Oil and Gas Refinery

#### Emergency Procedure / Escalation

##### Emergency

- Make "Site Safe" and isolate risks to people or property with resources at hand.
- Dial 111 etc.

##### Escalate if extra resources required or problems occur!

- Escalate to Team Leader and inform of the issues faced and/or expected resources required if necessary.
- Call planning engineer for assistance.

#### Additional Documentation

- Reservoir internal structure diagrams and report.

### Required Skills, Competencies (Qualifications and/or Certifications)

- At least 1 Working at Heights trained person.
- Operators trained in operating the ROV.
- Operators trained in clarifier operation and setup.

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### Standard Operating Procedure

#### Required Equipment

Equipment and Information	Details
Fully Equipped Vehicle	Ensure vehicle, plant, equipment, and materials appropriate to the day's work schedule is available
Specialist Equipment	<p><b>Remotely Operated Vehicles (ROVs):</b></p> <ul style="list-style-type: none"> <li>- Deep Trekker CCTV ROV</li> <li>- CCTV ROV tether</li> <li>- ROV remote control</li> <li>- Deep Trekker Utility Crawler ROV</li> <li>- Utility Crawler tether</li> <li>- Utility Crawler remote control</li> <li>- ROV assembly tools</li> <li>- Remote Controller with micro-SD card</li> <li>- Ballast adjustment kit</li> <li>- User manual</li> <li>- 1,000 mg/L (0.1%) chlorine solution in spray bottle</li> </ul> <p><b>Suction equipment:</b></p> <ul style="list-style-type: none"> <li>- Suction hose of adequate length</li> <li>- Pumps for specific site head</li> <li>- Extension cord/fuel</li> </ul> <p><b>Comfort/Safety:</b></p> <ul style="list-style-type: none"> <li>- Sunshade</li> <li>- Seats</li> </ul> <p><b>Clarifier:</b></p> <ul style="list-style-type: none"> <li>- Clarifier</li> <li>- Clarifier generators</li> <li>- Clarifier outflow pipe</li> <li>- Coagulant</li> <li>- Buckets for coagulant mixing</li> <li>- Drill and mixing rod for coagulant</li> </ul>

#### Prepare to do the work

Action	Action Details
Prior to arriving at site	<ul style="list-style-type: none"> <li>- Confirm Deep Trekker battery is charged.</li> <li>- Confirm micro-SD card is cleared of prior files.</li> <li>- Where required, relevant H&amp;S compliance documentation to be in place.</li> <li>- RCP, TMP, working at heights plan, Reservoir Internal hazards and plans.</li> </ul>
On site before starting work	<ul style="list-style-type: none"> <li>- Complete Tailgate Meeting discuss relevant H&amp;S documentation (RCP, TMP, working at heights plan, etc).</li> <li>- Ensure scaffolding is setup if required.</li> <li>- Setup clarifier, associated componentry, and generators.</li> <li>- Notify operations that reservoir hatch alarm will be activated as part of inspection activity.</li> <li>- Setup Deep Trekker Utility Crawler and CCTV ROVs.</li> <li>- Setup generators and hoses.</li> <li>- Disinfect Deep Trekker, tether cable and cable container by spraying 1000mg/L (0.1%) chlorine solution to ensure ROV is disinfected prior to entering reservoir. Place disinfected tether cable in container of drinking water, ensuring cable can</li> </ul>

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	<p>freely uncoil from container during inspection.</p> <ul style="list-style-type: none"> <li>- Check Deep Trekker tethers are secure.</li> <li>- Ensure clarifier is ready to begin pumping.</li> </ul>
<b>Compliance</b>	Traffic Management Plan - Where required, TMP to be in place prior to work starting. TMP to be accessible on site.
<b>Notifications</b>	Notify all COG when this work is to be undertaken.
<b>Organise</b>	Organise all resources involved in completion of work. This includes, Internal staff, external contractors, service providers or IQPs.

### Perform Reservoir Cleaning

Action	Trade	Action Details
<b>Lowering ROVs into reservoir</b>	Trained Operator	<ul style="list-style-type: none"> <li>- Lower ROV slowly into reservoir being careful to avoid internal obstacles and dropping it on the bottom.</li> <li>- Use crane or hose and follow RCP ensuring operator is secured to railing.</li> <li>-</li> <li>-</li> </ul>
<b>Priming hoses</b>	Trained Operator	<ul style="list-style-type: none"> <li>- Prime hoses by lowering hose into reservoir, shortening the length of hose, or decreasing the head on the pumps if necessary.</li> </ul>
<b>Removal of silt</b>	Trained Operator	<ul style="list-style-type: none"> <li>- Work slowly using the ROV to cause minimal silt disturbance.</li> <li>- Assess silt depth to determine if it is feasible to continue.</li> <li>- Create a bare patch below drop zone to enable direction changes without silt disturbance. Silt is to be disposed of at approved disposal site.</li> </ul>
<b>Driving around</b>	Trained Operator	<ul style="list-style-type: none"> <li>- Maintain location awareness using CCTV ROV to avoid obstacles.</li> <li>- If lost, stop, and regain awareness.</li> <li>- If stuck, stop, follow procedures in RCP.</li> </ul>

### Post Reservoir Cleaning

Action	Trade	Action Details
<b>Removal of ROVs from reservoir</b>	Trained Operator	<ul style="list-style-type: none"> <li>- Drive ROVs close to hatch.</li> <li>- Lift gently to avoid swinging into obstacles.</li> <li>- Follow safety procedures</li> </ul>