

# **Greater Taree City Council**

## **DRAIN MAINTENANCE GUIDELINES FOR ACID SULFATE SOILS AS DEFINED BY THE ASS RISK MAPS**

**Council Resolution 23 September 2005**

**These Drain maintenance guidelines have been prepared and endorsed by the Acid Sulfate Soils Extension Project Working Group. This group is representative of the Manning Delta Landholders Protection Committee, the Hunter/Central Rivers Catchment Management Authority and Greater Taree City Council.**

**The aim of these guidelines is to:**

1. Improve drain maintenance practices to reduce inappropriate discharges into waterways during and after drain cleaning operations.
2. Increase awareness of options for weed control in drains other than by mechanical works.

**Drain Maintenance Options**

Landholders should thoroughly investigate the feasibility of implementing non-mechanical maintenance strategies for open drains in preference to mechanical weed removal. These options include:

1. Filling in the drain so that the shallow drain can be slashed or mulched
2. Spraying weeds in the drain
3. Promote tree growth along the northern edge of drains to shade out weeds
4. Modify floodgates to allow salt water exchange
5. Moving floodgates to better positions.

**ALTERNATIVE METHODS FOR DRAIN AND FLOODGATE MAINTENANCE**

	<b>RECOMMENDED PROCEDURES</b>	<b>EXPLANATION</b>
<i>Saltwater Flushing</i>	<p>Repair leaking floodgates only if they are causing damage to agricultural production or are in danger of structural failure.</p> <p>Assess whether floodgate redesign is required (automated tidal exchange device or sluice gate).</p>	<p>Leaking floodgates can have environmental benefits by flushing drains thus improving water quality, controlling some freshwater weeds and maintaining elevated ground water levels.</p> <p>Controlled opening allows the extent of salt water intrusion to be measured and/or controlled.</p>
<i>Spraying Drains to Control Aquatic Weeds</i>	<p>Apply herbicides only in dry periods to avoid adverse impacts from the export of herbicide and decaying plant material from the works area.</p> <p>Floodgates should be closed during and after spraying for the period specified by the chemical manufacturer to allow any surplus chemical to breakdown before entering the river.</p> <p>Ensure any spray contractors are appropriately licensed. Ensure that the proposed herbicide is fully compliant with an EPA licence for use on aquatic weeds and comply with label directions.</p> <p>Roundup bioactive is currently the only chemical permitted for use around water spraying into water.</p>	<p>Herbicide use in aquatic situations is strictly controlled because the containment of the herbicide during and after spraying can be affected by dispersion of the chemical in water and any water movement through the work area. Also decaying vegetation matter can pollute waterways.</p> <p>EPA contact: 4908 6818</p>
<i>Use of Tree Cover for Weed Control</i>	<p>Allow full tree cover on the northern, north-west or north-east side of the drain to inhibit weed growth through shading.</p> <p>Design drains to be cleaned out from the southern side of the drain.</p> <p>Monitor and manage tree growth.</p>	<p>Weeds will not grow well in shade. Maximum shade is achieved when trees are growing on the northern and north-west side of the drain. An added benefit is that tree root systems stabilise drain banks.</p> <p>This allows unobstructed access for cleaning while allowing trees on the northern side to grow without the need for removal.</p> <p>Composting leaves can add to the monosulphide black ooze and fallen limbs can block drains.</p>

In the event that mechanical drain maintenance is the only viable option, operators should use a reed bucket and adhere to the following procedures.

### DRAIN AND FLOODGATE MAINTENANCE PROCEDURE

	Recommended Procedure	Explanation
<b>1</b> <i>Notification</i>	The landholder and operator need to ensure any proposed works comply with all relevant legislation. Lack of knowledge is not an option for appeal if a breach occurs.	<p>A Controlled Activity Approval will be required from NSW DPI Office of Water if works are to be carried out within 40m of a natural waterway. Contact: DPI 1800 353 104.</p> <p>A permit may be required for damage or removal of mangroves, and for dredging or reclamation works near waterways. Contact: DPI (NSW Fisheries) 4916 3931.</p> <p>Approval under the NSW Native Vegetation Act may be required for the removal of any native vegetation that was growing prior to 1990. Contact: Hunter Local Land Services 6551 8994.</p>
<b>2</b> <i>Timing of works</i>	<p>Drain cleaning works should be scheduled for drier climatic conditions to minimise the potential for any runoff (late winter - early summer).</p> <p>If sufficient rain occurs during work so as to increase the potential of uncontrolled discharge, work should stop immediately and any potential discharge minimised and any actual discharge monitored and treated as required. Works are not to recommence until runoff ceases.</p>	<p>There is a high risk of severe environmental impacts on receiving waters when water flows over drain spoils or through recently worked drains and discharges into waterways.</p> <p>Work should not be carried out, where possible, if the drain is running.</p>
<b>3</b> <i>Machinery Access</i>	Before entering other private property or Crown Land with excavating equipment, at least verbal notification should be provided to private property owners and written notification to managers of Crown land.	It is important to ensure that all affected landholders are aware of the proposed works to be undertaken on or adjacent to their property.
<b>4</b> <i>Excavator Operators</i>	<p>If a contractor is doing the work, preference should be given to contractors who have attended relevant training.</p> <p>The contractor should be provided with a Works Procedure Plan by the landholder.</p> <p>The contractor should work in such a way as to minimise sediment disturbance when removing aquatic weeds.</p>	<p>Contractors must have received accreditation and approved training in recognising and handling ASS material to ensure work is properly carried out.</p> <p>Written instructions are an important means of risk management as well as assisting the operator in understanding his task.</p> <p>Many aquatic plants have rooted systems within the drain sediments that make it impossible to avoid sediment disturbance when removing drain weeds. However all care should be taken to minimise sediment disturbance or removal.</p>
<b>5</b> <i>Pre-works management</i>	<p>Lime must be immediately available for delivery, prior to any works.</p> <p>Ensure floodgates are shut or install a temporary weir or silt curtain in drains to contain water/sediment prior to work commencing. Do not lift floodgate, remove temporary weir or silt curtain for two weeks after works are completed to</p>	<p>The landholder needs to ensure they can access lime when and if necessary during the planned works.</p> <p>Sediment curtains can be obtained from most hardware shops. This will assist in containing any disturbed sediment and preventing discharge of turbid water to waterways.</p>

	Recommended Procedure	Explanation
	<p>allow sediment to settle and water pH to return to normal. Lime may be added to assist pH to return to acceptable levels.</p> <p>All works should commence in the upper reaches of the drain and progressively work towards the outlet.</p> <p>Mature riparian vegetation should not be disturbed and/or removed unless absolutely necessary to facilitate access for the excavating machinery.</p>	<p>Existing vegetation can help 'filter' sediment laden water and allows time for sediment to settle out prior to reaching the outlet.</p> <p>Riparian vegetation helps shade drains to minimise weed growth and should be encouraged to reduce maintenance frequency and costs.</p>
<b>6</b> <i>Determination of Liming Rate</i>	<p>Drain sediment and spoil should be tested to confirm the presence of ASS and determine an appropriate liming rate.</p> <p>An alternative to testing drain sediment in smaller scale projects involving maintenance activities less than 500 metres is to apply a conservative generic liming rate of <b>75kg/m<sup>3</sup></b>.</p> <p>For any drain maintenance activities greater than 500 metres it would be advisable to sample and laboratory test to reduce liming costs and avoid over liming.</p>	<p>More appropriate management strategies can be developed with detailed laboratory information on soil/drain sediment properties.</p> <p>This conservative generic rate has been set to allow landholders to minimise testing costs while also minimising adverse environmental risk from disturbance.</p> <p>Amount of lime required can be calculated by: Length of drain x Width of drain x Depth of disturbance x Liming rate/m<sup>3</sup> spoil (75kg/m<sup>3</sup>) e.g. 400m x 2m x 0.2m x 75 = 12,000 kg lime</p> <p>It may be more economical to carry out tests for drain cleaning work over 500m in length rather than applying generic liming rate.</p>
<b>7</b> <i>Sediment and spoil management</i>	<p>Lime should be added to the drain prior to excavation of weeds to facilitate mixing within the drain.</p> <p>A layer of lime (¼-½ of lime) should be spread on the ground where the spoil is to be placed.</p> <p>Any sediment, spoil or vegetation material excavated must be positioned to avoid runoff and/or leachate entering into watercourses.</p> <p>Excavated spoil is then spread in a thin layer over the lime, with the rest of the lime spread over the spoil.</p> <p>Mix the top lime into spoil as soon as the material is dry enough to be cultivated.</p>	<p>Lime will assist in the neutralisation process.</p> <p>Spreading spoil in a thin layer will assist the mixing of lime by cultivation.</p>
<b>8</b> <i>Mangrove Removal</i>	<p>A permit [Part 7 Harm Marine Vegetation Permit] is required from NSW DPI Fisheries to cut, damage or destroy marine vegetation and this applies for any mangrove removal in front (outside) of floodgates.</p> <p>Under permit, to maintain the function of the drain and floodgates, limit mangrove removal in front of floodgate to the base of the drain and remove young mangroves</p>	<p>Mangroves are protected under the NSW Fisheries Management Act because of their importance as fish habitat. The permit process minimises the removal of important habitat for aquatic species and ensures that any works minimise disturbance to the site.</p> <p>Removal of young plants (only with approval from NSW Fisheries) by hand outside the floodgate minimises disturbance of drain sediment and reduces long-term maintenance</p>

	<b>Recommended Procedure</b>	<b>Explanation</b>
	<p>by hand.</p> <p>NSW Fisheries have advised that no permit is required to remove problematic mangroves from the base of drains <u>behind</u> operational floodgates.</p> <p>Where possible, leave mature mangroves. If mangroves must be removed, replace with other tree species planted on the levee to shade the water, improve fish habitat and prevent the germination and growth of reeds.</p>	<p>costs for landholders.</p> <p>Mangrove removal <u>behind</u> floodgates without permits should only be undertaken along the centre of the drain and by hand tools only.</p> <p>Drain bank stabilisation is critical for both the landholder and the environment.</p>
<b>9</b> <i>Deepening or Widening Drains</i>	<b>The original profile of the drain must not be enlarged.</b>	<b>Any widening or deepening of drains will require development consent from Council.</b>

Clearing of drains can enhance their flood mitigation capacity but can also increase their capacity to drain the soil water table. If drain clearing lowers the water level in the drain, pen stocks or a weir should be fitted to the drain to maintain water table levels.

Any new drain construction work will require development consent from Council.

If you wish to seek any further information on these guidelines contact Greater Taree City Council on 6592 5399.