TASMAN DISTRICT COUNCIL EXP 10-10-2020.

DISCHARGE PERMIT APPLICATION FOR THE DISPOSAL OF BIOSOLIDS FROM THE BELLS ISLAND OXIDATION PONDS TO BELLS ISLAND BY SPRAY IRRIGATION.

NN980122D: NELSON REGIONAL SEWERAGE AUTHORITY

1. APPLICATION DETAILS – DISCHARGE TO LAND CONSENT

Applicant:	Nelson Regional Sewerage Authority, c/- Nelson City Council, P O Box 645, Nelson. Attn: M. Schruer
Address for Service:	Opus International Consultants Limited, Level 4, Civic House, 106 Trafalgar Street, Private Bag 36, Nelson
Purpose of permit:	To discharge biosolids processed through the ATAD (aerobic) sludge digesters at the Bells Island Sewage Treatment Plant to approximately 18 hectares of forested land on Bells Island **and** to approximately 4 ha of 2 metre thick waste bark infill on the eastern and southern sides of Bells Island.
Discharge Rates:	(a) To forestry at a maximum nitrogen loading rate of 300 kg/ha over any three year period at an average depth of no greater than 40 mm per application. (b) To bark areas at a maximum nitrogen loading rate of 600 kg/ha over any three year period at an average depth of no greater than 40 mm per application.
Application Method:	Application to forest stands is to be by spray gun irrigation from a mobile tanker. Application to the bark area will be by pumping biosolids directly into prepared furrows in the bark. Once dried, the surface will be rotovated then grassed for grazing or the production of hay or silage.
Term Sought:	10 October 2020, coincident with the expiry date for the Rabbit Island discharge consent NN940379.
Status:	Non-notified consent.
Investigating Officer:	H A Crutchley, Consultant.

The management target of the NRSA for the sludge treatment plant on Bells Island is to produce a Class A sludge as set out in the USEPA guidelines, part 503.32. These guidelines require a minimum temperature/retention time relationship to be met and one of two microbiological standards to be complied with. Class A sludge is the highest achievable 'grade' of biosolids set down in the USEPA guidelines and is virtually free of pathogens. The USEPA consider it microbiologically safe enough for immediate human contact.

Monitoring of the Bells Island sludge treatment plant temperatures and the microbial quality of the biosolids has confirmed that it reaches the USEPA class A standard. Potential for microbial contamination of soil, water and air as a result of biosolids application is therefore very low. Monitoring to check class A standards continue to be met is recommended. Should biosolids not meet the Class A requirements for any reason, biosolids shall not be applied to Bells Island. An area on Rabbit Island has been specifically set aside for this purpose if needed.

Overseas research concludes that potentially toxic inorganic and organic compounds in biosolids will accumulate in surface soils. These compounds are found in relatively low concentrations in the Bells Island biosolids according to monitoring results gathered by the NRSA. Potentially toxic inorganic contaminants fall well within the Department of Health's 1992 recommended annual loading rates at both proposed biosolids application rates. Maximum limits set down in the DOH guidelines for arable land will eventually be reached if biosolids continue to be applied to these areas. Bark areas will reach these limits first as they receive twice the volume of biosolids applied to forestry soils.

A recent literature review by the NZ Land Treatment Collective (NZWTC No 15) concludes that soil microbes and macro-fauna are unlikely to be affected by potentially toxic inorganic compounds at concentrations within the DOH 1992 guidelines. They also conclude that the risk to soil quality from potentially toxic organic pollutants in biosolids is low. Sludge from the ponds was screened for organochlorine and organophosphate compounds in September 1992 and found to be below 0.25 mg/kg dry weight. A repeat screening is recommended before disposal of biosolids to Rough Island commences to confirm this continues to be the case.

Measurable contamination of coastal water is not expected as a result of this proposal. Continued monitoring of two existing coastal transects, one adjacent to the forest and one adjacent to a bark area, is recommended to verify this.

7 RECOMMENDATIONS

That discharge permit NN980122D be granted, expiring 10 October 2020, for the discharge of biosolids to Bells Island as outlined in the application at the locations shown in the attached plan, subject to the following conditions:

7.1 Records to be kept

The permit holder shall keep such records as may be reasonably required by Council and shall, if so requested, supply this information to the Council. If it is necessary to install measuring devices to enable satisfactory records to be kept, the permit holder shall, at his or her own expense, install, operate and maintain suitable devices.

7.2 Access for Council Staff and Agents

Access by Council staff or its officers or agents to the land subject to this discharge permit are reserved pursuant to section 332 of the Resource Management Act.

7.3 Review of Conditions

7.3.1 The Tasman District Council may each year, within two months of the anniversary of the granting of this consent, serve notice of its intention to review the conditions of this consent pursuant to section 128 and 129 of the Resource Management Act 1991 for the purposes of:

(a) Dealing with any adverse effects which may arise from the exercise of this consent and which it is appropriate to deal with later; or,
(b) Requiring the adoption of the best practicable option to remove or reduce any adverse effects on the environment; or,
(c) Complying with the requirements of a relevant rule in an operative regional plan; or,
(d) Ensuring compliance with the most recent New Zealand guideline for land application of biosolids (sewage sludge); or,
(e) Amending the frequency and location of monitoring and parameters monitored; or
(f) Changing the width of buffer zones; or
(g) Changing the application regime if the nitrate nitrogen concentrations measured in the groundwater exceeds 11.3 mg/l.

7.3.2 Within one year of completion of the first application of biosolids, the permit holder shall provide the Council with a written assessment of all monitoring, identifying any trends and problems so that the need for a review of conditions can be determined by Council.

7.4 Application of Biosolids

7.4.1 Biosolids shall be applied at an average depth of no greater than 40mm per application.

7.4.2 Biosolids shall not be applied within 24 hrs of a 10 mm rainfall event occurring in a 24 hr period.

7.4.3 Biosolids shall not be applied if a rainfall of more than 50 mm is forecast within the following 24 hrs by a recognised meteorological forecasting service.

7.4.4 If even application of biosolids is not possible due to wind, then application shall cease in the area affected.

7.4.5 Nitrogen loading per hectare to forestry shall not exceed 300 kg/ha over any three-year period.

7.4.6 Nitrogen loading per hectare to waste bark areas shall not exceed 600 kg/ha over any three-year period.

7.4.7 Biosolids shall not be applied to Bells Island if the USEPA Class A standards in the attached Schedule are not met.

7.4.8 Biosolids application shall cease immediately if any new archaeological sites are discovered and both the New Zealand Historic Places Trust and iwi shall be notified.

7.4.9 Bark areas shall be used for the production of non-legume based hay or silage only and shall not be grazed by stock.

7.5 **Exclusion Zones and Buffer Zones**

7.5.1 Exclusion zones and buffer zones (no spray areas) shall be marked clearly by the use of wire or other means as approved by the Environment and Planning Manager, Tasman District Council, so that the biosolids contractor is quite clear which areas are not to be sprayed.

7.5.2 Biosolids shall not be applied to cleared areas of forest, trees less than six years of age, or to trees to be harvested within six months

7.5.3 A buffer zone of 15 metres in from the edge of the forest or 50 metres from Mean High Water Springs, whichever is the greater, is to be observed around all biosolids applications.

7.6 **Monitoring**

Biosolids

7.6.1 Continuous measurement of biosolids temperature within the ATAD digesters shall be made and recorded for the duration of the consent. Biosolids shall be held at 50°C or higher for the minimum duration required by the equation given in the attached USEPA Class A schedule. Four times a year microbial monitoring shall be carried out to check for compliance with the USEPA faecal coliform or salmonella standards as set out in the attached schedule.

Continuous monitoring of biosolids temperature in the ATAD digesters is required by the Rabbit Island consent. Such monitoring should continue during disposal to Bells Island. The frequency of monitoring is taken from recommendations made in the USEPA design manual for the land application of sewage sludge, 1995. I understand an area on Rabbit Island is available for the disposal of biosolids which do not meet class A temperature or microbial standards where the public can be excluded for a period of one year after application.

7.6.2 At a minimum of three monthly intervals a representative sample of biosolids shall be taken and the content of dry solids, organic matter, pH, total and ammoniacal nitrogen, phosphorous, potassium, arsenic, cadmium, chromium, copper, lead, mercury, nickel, zinc, and aluminium measured.

A similar condition exists on the Rabbit Consent based on the DOH 1992 standards.

7.6.3 Screening of a representative sample of biosolids for semi-volatile organic compounds (SVO) shall be carried out prior to biosolids disposal commencing. If the District Resource Analyst or his agent considers results high, a second SVO test and a dioxin test shall be carried out.

This test will detect the presence of PCB, PAH and organochlorine compounds in the biosolids. This is recommended as only one such screening of sludge has been carried out to date in 1992 before the sludge treatment plant was constructed, and the Rabbit Island consent monitoring does not require one until 2000, well after the intended first application of biosolids to Bells Island.

Groundwater

7.6.4 Two monitoring piezometers shall be installed to a depth of 2 metres below the groundwater table to the satisfaction of the Council's District Resource Analyst at locations shown on the attached map.

7.6.5 Before application of biosolids commences, the following shall be carried out at both piezometers on two separate occasions:

(a) Representative samples shall be taken and analysed for pH, conductivity, nitrate-nitrogen ammonium-nitrogen and chloride.
(b) Representative samples shall be taken and analysed for **soluble** arsenic, cadmium, chromium, copper, lead, mercury, nickel, zinc and aluminium.

7.6.6 Before application of biosolids commences, groundwater levels shall be monitored across a tidal cycle in the two piezometers installed as set out in 7.6.4 above and at the ten existing piezometers installed for monitoring consent NN930270D shown in the attached plan. Hydraulic gradients and direction of groundwater flow shall be determined by measuring groundwater levels simultaneously at high tide, low tide and an intermediate point of tide to be selected in discussion with the Council's District Resource Analyst or his/her agent.

Such monitoring has been recommended in Appendix A of the AEE provided by Opus with the application.

7.6.7 After application has commenced, the following groundwater monitoring shall be carried out at the two piezometers installed under condition 7.6.4 above:

(a) At three month intervals representative samples shall be taken and analysed for pH, conductivity, total phosphate, nitrate-nitrogen, ammonium-nitrogen and chloride.
(b) Once a year representative samples shall be taken, and analysed for **soluble** arsenic, cadmium, chromium, copper, lead, mercury, nickel, zinc and aluminium.

Soils

7.6.8 Soil samples will be taken from the topsoil (0 to 20 cm) and subsoil (20 to 40 cm) from four sites on Bells Island, two located within the forestry area and two within the bark areas, and analysed as follows:

(a) Within three years of the first biosolids application Soil pH, organic matter, total nitrogen, available phosphorous, potassium, calcium, magnesium, sodium and a minimum of the following heavy metals; arsenic, cadmium, chromium, copper, lead, mercury, nickel, zinc and aluminium shall be measured. After this subsequent soil monitoring shall be carried out six yearly.

(b) Heavy metal annual loading and cumulative loading shall be within the limits recommended in the Department Of Health 1992 Guidelines for arable land as follows:

Element	Maximum Annual Loading (kg/ha/yr)	Maximum Cumulative Loading (kg/ha)	Maximum Soil Concentrations (mg/kg dry weight)
Arsenic	0.2	2.5	10
Cadmium	0.2	2.5	3
Chromium	15	125	600
Copper	12	100	140
Lead	15	125	300
Mercury	0.1	1	1
Nickel	3	20	35
Zinc	30	250	300

(c) Once any maximum cumulative loading limit or maximum soil concentration limit in the above table is reached then the application of biosolids on Bells Island must cease in that area.

Biosolids produced on Bells Island have a very low metal content compared to sludges elsewhere in NZ and annual application rates set at 300 kgN/ha and 600 kgN/ha fall well within the annual maximum loading rates set down in the above table. Compliance with the annual and cumulative loading rates is determined knowing the concentrations present in the biosolids and the application rates used and does not rely on soil testing. The maximum soil limits are unlikely to be reached for the duration of this consent so frequent monitoring of soil concentration seems unnecessary. The DOH 1992 require five yearly monitoring of soil concentrations in their 1992 guidelines. I consider it reasonable to reduce the frequency of soil monitoring to six yearly in this case as biosolids is applied three yearly.

Coastal Monitoring

7.6.9 After application commences, transects 1 and 6 shown in Figure 1 attached to this consent shall be monitored at times concurrent with the six yearly coastal monitoring programme already established under consent NN 940379D for Rabbit Island as follows:

(a) A survey of benthic micro and macro algal cover shall be undertaken every six years.

(b) A transect survey including sediment profile descriptions and habitat classification shall be undertaken every six years.

(c) Visual checks along the Bells Island foreshore adjacent to the disposal areas shall be undertaken every three years. Photographic records shall be taken at each inspection. Should this visual check indicate any adverse effects on the foreshore, further analysis ad tests are to be undertaken at the discretion of the Council's District Resource Analyst or his agent.

8.0 Monitoring Charges

The applicant will be required to meet Council's actual and reasonable charges incurred as a result of monitoring compliance within the terms of this consent.

9.0 Notification of Problems

The Environment and Planning Department of the Tasman District Council is to be notified as soon as possible, and within 24 hours, of any problems which arise during the biosolids disposal which may result in adverse environmental effects.

10.0 Remedial Works

Council's District Resource Analyst or his/her agent may require remedial works to be implemented if monitoring shows unacceptable environmental impacts.

11.0 Contingency and Management Plan

The biosolids application operation on Bells Island shall be included in the Rabbit Island Biosolids Application Plan.

NON-NOTIFIED

APPROVED AS RECOMMENDED UNDER DELEGATED AUTHORITY

TASMAN DISTRICT COUNCIL
Issued by
Andrew Fenemor
District Resource Analyst
pursuant to delegated
authority under the
Resource Management
Act 1991
on behalf of

Andrew Fenemor
District Resource Analyst

Date 3-9-98

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