Greenhouse Nutrient Discharge Decision Process

Do you discharge nutrient solution?

No → No problem

Yes

Calculate the volume and nitrogen content of the discharge.

Reference values.
Your measured values should be used.

Water and nitrogen 1 ha greenhouse - per year	Run-to-waste	Recirculate
Discharged solution (m^3/ha/yr)	4,000	1,000
Nitrogen concentration (ppm)	400	400
Nitrogen (kgN/ha/year)	1,600	400

Next

Is irrigating to your land an option?

No →

Other options include:
- Collect and supply to a neighbouring landowner with land for irrigation.
- Truck it away as waste.
- Connect to a sewer – consents may be required.
- Investigate denitrification / filter beds.
- Obtain a consent to discharge.

Yes

Calculate the area needed.

Disposal area 1 ha of greenhouse - per year	Run-to-waste	Recirculate
Area (ha) @ 150 kgN/ha/year	10.7	2.7
Area (ha) @ 200 kgN/ha/year	8.0	2.0

Next

Calculate the storage area needed.

Sufficient storage is crucial. You may need 3 months or more storage, at winter discharge rates. See the next page for examples.

Next

Storage – 3 months 1 ha of greenhouse	Run-to-waste	Recirculate
Covered storage (m^3/ha)	1,000	250
Uncovered storage (m^3/ha)	1,600	400

How will you manage the land application?

Refer to the Code of Practice

Next

Do you meet the permitted activity conditions in the Regional Plan?

No → Apply for a resource consent.

Yes

Less than 1 hectare plus comply with performance conditions – see checklist

Apply discharged nutrient solution to land using best management practices, including keeping records to show how conditions are being met.

Storage – Auckland

Sufficient storage is essential for successfully managing your nutrient discharges.

Calculating the required storage needs to take into account the period when the soil cannot be irrigated, the discharge rates over this time, the soil type, and for uncovered storage ponds rainfall (rain falling directly on the pond increases the storage requirements).

Dairy NZ has some excellent guidance on effluent storage requirements, soil risk, and application systems. The storage calculations below were determined using their Dairy Effluent Storage Calculator http://www.dairynz.co.nz/environment/effluent/effluent-storage/

The tables below give the storage requirements for a 1.0 hectare greenhouse discharging an average of 2.7 m^3/day (1,000 m^3/year) into both covered and uncovered storage, and where the operation is irrigating onto high or low risk soils. These soil risk categories are described in the Dairy NZ booklet *Pocket guide to determine soil risk for farm dairy effluent application*.

High risk soil – average discharge of 2.7m^3/day when the soil is saturated (cannot irrigate)

	Covered storage			Uncovered storage (includes direct rainfall)				
	vol. (m^3)	days of storage		Vol. (m^3)	length (m)	Width (m)	Depth (m)	Batter (slope)
Waiuku	429	159		727	22	20	4.0	1.5 : 1
Pukekohe	387	143		623	20	20	4.0	1.5 : 1
Warkworth	290	107		493	20	17	4.0	1.5 : 1
Albany	257	95		373	19	15	4.0	1.5 : 1
Ardmore	273	101		400	20	15	4.0	1.5 : 1
Auck. average	327	121		523	20	17	4.0	1.5 : 1

Low risk soil – average discharge of 2.7m^3/day

	Covered storage			Uncovered storage (includes direct rainfall)				
	vol. (m^3)	days of storage		Vol. (m^3)	Length (m)	width (m)	depth (m)	batter (slope)
Waiuku	78	29		98	10	10	2.5	1 : 1
Pukekohe	51	19		57	10	7	2.5	1 : 1
Warkworth	43	16		50	9	7	2.5	1 : 1
Albany	44	16		50	9	7	2.5	1 : 1
Ardmore	44	16		50	9	7	2.5	1 : 1
Auck. average	52	19		61	9	8	2.5	1 : 1