(27)

Basic CV: Eric John Wagener: As at 26/8/2020

Born 2nd May 1946

Educated in Auckland.

Stage Three New Zealand Technician Building Diploma

Became a Master Builder on 1 February 1980

Became a Registered Drainlayer in 1970 issued with a Back Blocks Limited Plumbing license

Have a New Zealand Diploma in Farm Management

Am a past member of the Museums Association of New Zealand with qualifications attained in Museums Curatorship.

Statement:

I am a Registered Certifying Drainlayer, Accredited T.P58 writer and Storm Water Attenuation Designer, Past Master Builder & Cabinetmaker, self taught Mechanical Engineer, have a Diploma in Farm Management, Have papers in Soils and Fertilisers, had a Deer and Beef farm, along with market gardening, developed a 29haTamarillo orchard, Have been an active member of the Houhora Settlers and Ratepayers Association since 1968, holding the position of Chair for many years, was an Elected Foundation Member/ District Councillor with the amalgamation of authorities into the Far North District Council in 1989, held the position of Deputy Mayor for one term, was the chairman of a number of committees over the 12yr period of commitment to politics, and have been a foundation member of both the local volunteer fire brigade, and volunteer ambulance.

I have a commitment to the wellbeing and care of the community I live in.

I am Currently an invited community member on the Te Hiku Water Project studying all aspects of water resources and potential use in Northland.

I have prepared statements and submissions on behalf of the community and myself in the past and the current submission before you is a reflection of that.

As stated on many occasions I am not, and the community is not anti development or anti water resource use so long as that is shown to be sustainable.

Points:

1. The concept put forward by Williamson Water is that the Aquifer is and will be recharged by rain fall, mostly via the coastal dune structures, then by rainfall absorption over the soils from Kaitaia to Houhora.

I submit that that is a seriously flawed hypothesis. Studies in New Zealand and Southern Australia show that Radiata Pine will draw water from a depth of 8 to 10m, will transporate up to 2.5cum per ha, and use on average 1384mm of rainfall per annum. Roughly the total annual rain fall for this area. I have not seen figures for orchard canopy use but suspect that that also needs to be factored in. The Lincoln Report (page 25) gave calculations for the annual Aquifer recharge, and while these have subsequently recently been modified they state that rainfall varies from 580 > 1670mm/annum. The land area for recharge is given at 75322ha, with the forest at 27,451ha, which is approximately 40% of the total. As before the

pine trees will utilise all the rainfall on the 27,451ha, and so that area needs to be removed from the recharge calculation.

The above concern previously stated has not been addressed, recent Hydro Geo reports, which have just been received (page 10) agrees with my concern.

I have previously stated that the majority of the soils which make up the Kaitaia/Aupouri area have very low ksat figures, which are the rates at which soils will absorb moisture.

I now include a copy of the area soil map which clearly shows that huge areas have exceptionally poor drainage and therefore poor absorption capability.

The FNDC stormwater spread sheet also shows low ksat figures which are to be used when calculating ground pit absorption of stormwater.

As previously stated most of the peninsular from Kaitaia North is reclaimed swamp. These areas are all on impervious or semi impervious base structures, and are serviced by farm drainage schemes designed to minimise the retention of storm water. The same applies to the Kaikino, and Motutangi drainage schemes, without which the area would be swamp.

Further: All of Kaitaia township is equal to impervious layers, as is Awanui, Ahipara, Houhora, and pretty much all of the paved highways. All of these areas have storm water drains to remove the majority of the rainfall. Nowhere can I find any reference to allowances made for this in recharge estimates.

So given the above where will the recharge come from?

2. My understanding from the various reports presented is that all the current "Bores" go through layers of impermeable sandstone, and other impervious soil structures. There are none I am aware of which do not have to penetrate these layers. In fact it is stated in a number of reports that the reason that the deep aquifer under hydraulic pressure does not come to the surface is due to the restriction of these impermeable layers. If the deep water can not bypass these layers to come up then the same applies to potential recharge down.
3. The "Williamson Reports" allude to the fact that while under concentrated pumping the ground water pressure drops in the deep aquifer but the shallow aquifer remains largely unaffected, (above the impervious layer), stating that this shows that subsurface water migration is maintaining the status quo. On the contrary I believe that the reason the shallow aquifer remains largely static is that the shallow aquifer has no connection through the impervious layer and therefore is unaffected.
4. Further Hydro Geo Solutions have stated that "Over all bore hydrographs indicate a general decline in ground water levels since 1975 although annual rainfall (while varying from year to year) is only slightly below average for the period overall. If this is the trend then if replenishment is via rainfall why is there a recorded decline.
5. If it is assumed (A dangerous word) as it has been that surface water/Rain water is the source of replenishment then why has the aquifer been able to be dated at 70,000 years old surely rain water moving down would constantly force a flow seawards. This dating factor should raise alarm bells.
6. An opinion was received from an Auckland Hydrologist which said that quite possibly the aquifer could be the result of a gradually thawed sediment covered ice age

frozen mass, which could account for the water being aged at 70,000 years old. This then would mean that this is a totally confined aquifer and a finite resource. I am not in a position to comment further on that view. Other than to state that if abstraction lowers the deep aquifer hydraulic pressure to a critical point, whatever the nature of the Aquifer then major subsidence will occur, which will be irreversible. As we are told that the whole aquifer is contiguous then the whole of the peninsular is in effect floating on this resource.

7. If the cliff face/beach intersection along the Houhora Harbour is examined it becomes evident that surface water is hitting the impermeable sandstone layers and flowing into the sea.
8. Reports state that Hydrological pressure within the aquifer is balancing seawater intrusion, it is also in recent reports stated that some intrusion has already occurred. If what was being taken was being rapidly replenished from the shallow aquifer then that intrusion would not have occurred.
9. The NRC in its Information pack, "Requirements For Resource Consent Take or Use Groundwater Advice to Potential Applicants" shows that the effects of abstractions have a radial component. The table shows jumps of 100m radial effect for increases in water abstraction. This table shows that the abstraction of 100m3 per day has a 500m radius of effect. If this is extrapolated to cover current takes it would mean that a daily use of 1000m3 would have a 5000m radius of effect. A large number of the existing and proposed bores are overlapping or well within the 500m radius of each other and so the cumulative environmental effect is one bore take added to another in cubic meter effect. This multiplication factor can place the radial effect well off shore, certainly anything but that referred to by the Northland Regional Council as "Having Minor Effects". Where bores are relatively adjacent then the daily take in Cubic meters should be taken into account and the effects rationalised and combined.
10. There are a number of areas in New Zealand where saltwater intrusion has occurred. The municipal bore for Wellington had to be relocated for that reason, presumably that bore was the subject of hydrological studies which undoubtably concluded that there was no chance of intrusion, but those studies have subsequently been proved to be wrong.
11. The latest Williamson Water Report draws a correlation with the Aupouri Aquifer and Lake Taupo. The Aupouri Aquifer is not free water it is water in a sand/shell slurry, so the comparison is not a true representation. Further reports of water storage in the aquifer could be overstated by possibly 25> 40% due to the fact that it is water held in sand. How much is water and how much is sand.
12. It is distressing to note that Brookfield Lawyers have used/applied articles from the Resource Management act to remove material from public submissions, but have not applied the same process to Hydrology reports. While I have not had the time to examine the legalities of this I believe that The New Zealand Bill of Rights will have clauses to ensure that every one is treated equally. In this respect I am also of the opinion that the Northland Regional Council is remiss in limiting submissions to those with Bores, everyone in the community is and will be affected, with a right to express their view.
13. The Environment Court in it's deliberations were sufficiently concerned at unknowns, and conjecture in reports, that it imposed restrictive conditions on

previous applicants. It is hard to see how these new applications can proceed while this judgement is still in effect, with some of the "unknowns" still remaining. This opinion appears to be supported by a recently obtained environmental lawyer's view.

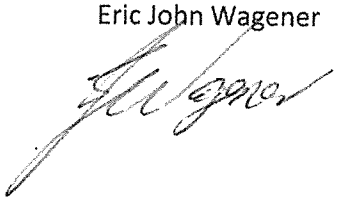
As stated on many occasions I believe that the community is not against abstraction, or development so long as that is proven to be sustainable. I do not believe given all the anomalies in current reports, that it is sustainable.

The huge amount of material put forward at the last moment for comment/information, some 1000 pages in all, delivered in a few days before a complex hearing, is impossible to form an opinion upon in the time given, is outside statuary legislative requirements, and is just not just.

I am acutely aware that these observations will not be pleasing to all, however it is in every ones best interest to ensure the sustainability of a critical resource which ultimately we collectively do, and will all rely upon.

For the above reasons I do not believe that under the present studies that the abstraction proposed is proven justifiable or sustainable.

Eric John Wagener



SOILS

AHIPARA - HEREKINO

N04 /05

Re-Order Filemaster "D"

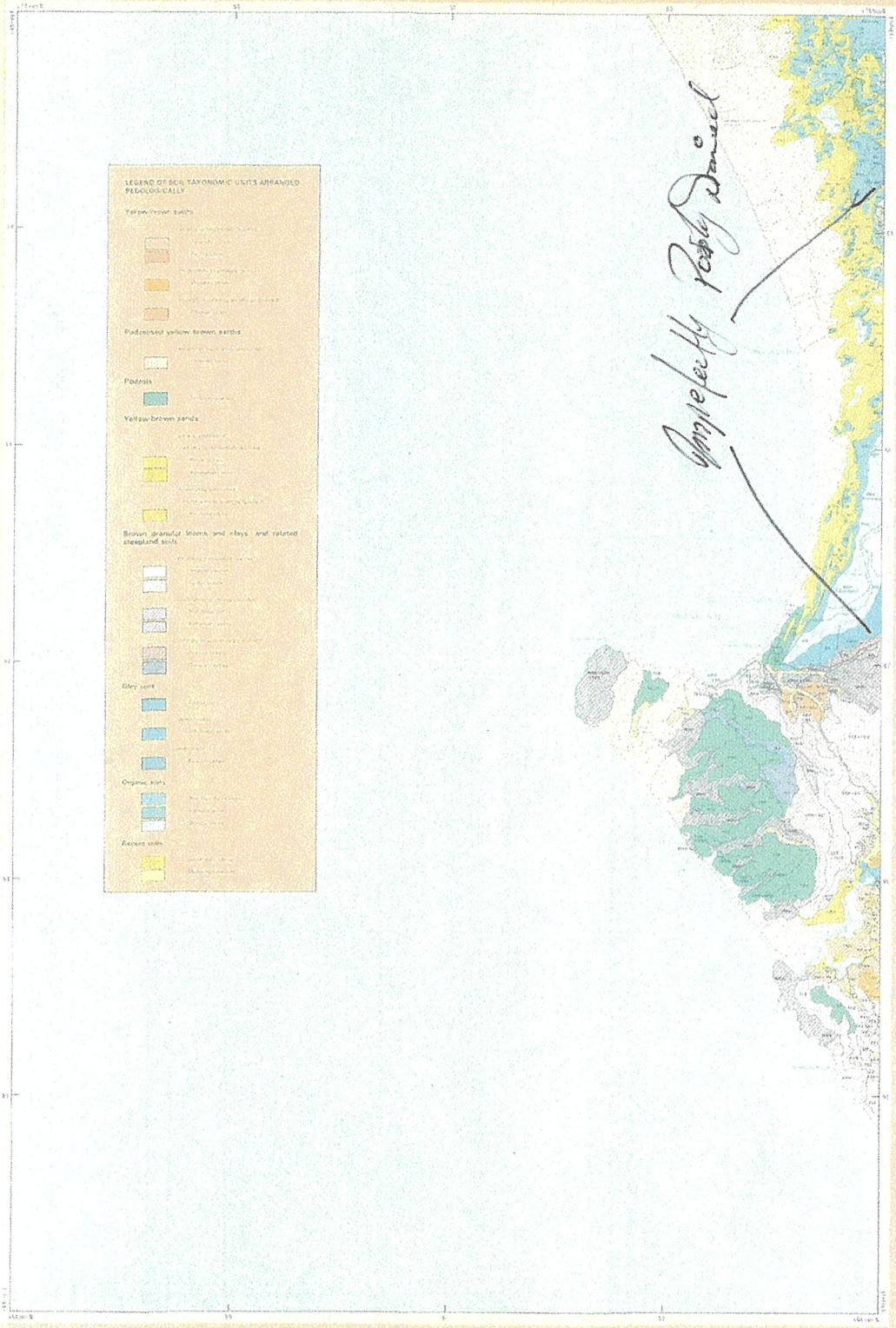
SELF-ADHESIVE PLAN HANGER

SOILS

AHIPARA–HEREKINO

SOIL CON

NZMS 290 SHEET N04/05



SHEET INDEX

NEW ZEALAND LAND INVENTORY

SCALE 1 : 100 000

REFERENCE

SOILS

SOILS

NORTH CAPE- HOUHORA

Re-Order Filemaster "D"

SELF ADHESIVE PLAN HANGER

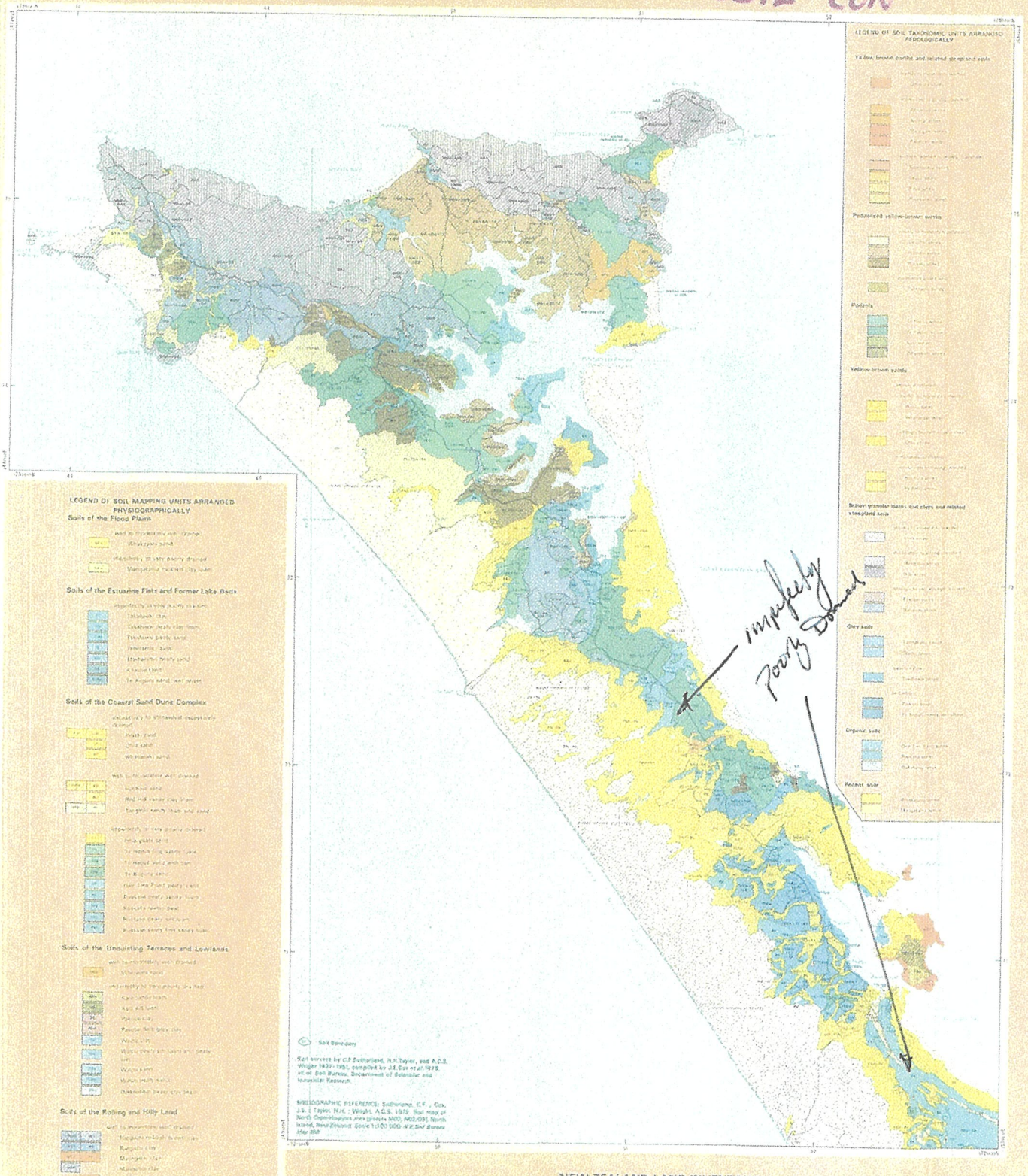
N02/03

SOILS

NORTH CAPE–HOUHORA

Soil Con

NZMS 290 SHEET N02/03
Part Sheet M02

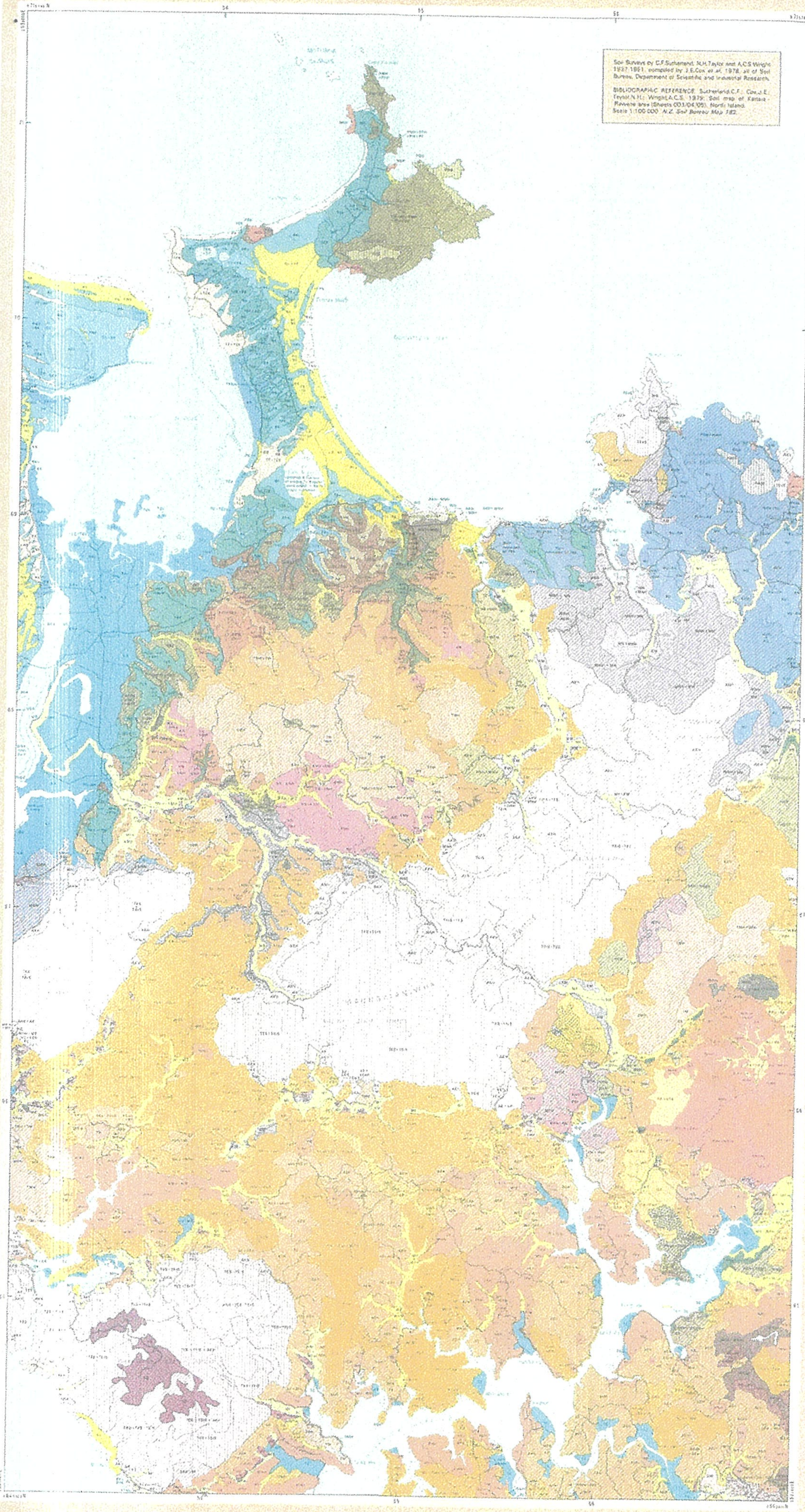


impurely poorly drained

NZMS 290 SHEET N02/03
Part Sheet M02

SOILS

KAITAIA–RAWENE



Soil Surveys by C.F. Sutherland, N.H. Taylor and A.C.S. Wright 1937-1951, compiled by J.E. Cox et al. 1978, all of Soil Bureau, Department of Scientific and Industrial Research.

BIBLIOGRAPHIC REFERENCE: Sutherland, C.F.; Cox, J.E.; Taylor, N.H.; Wright, A.C.S. 1979: Soil map of Kaitaia-Rawene area (Sheets O03/04/05), North Island. Scale 1:100 000. *N.Z. Soil Bureau Map 182.*

LEGEND OF SOIL MAPPING UNITS ARRANGED PHYSIOGRAPHICALLY

Soils of the Flood Plains

well to moderately well drained
- Whakapara sand
- Whakapara silt loam and clay loam
- Mangakahia silt loam and clay loam

imperfectly to very poorly drained
- Whakapara mottled clay loam
- Mangakahia mottled clay loam

Soils of the Estuarine Flats and Former Lake Beds

imperfectly to very poorly drained
- Takahiwai sand
- Takahiwai clay
- Takahiwai peaty clay loam
- Takahiwai peaty sand
- Kaipara clay and clay loam
- Kaitaia clay loam
- Kaitaia peaty clay loam
- Kaikino sand
- Te Kopuru sand, wet phase

Soils of the Coastal Sand Dune Complex

excessively to somewhat excessively drained
- Pinaki sand
- Ohia sand
- Whananaki sand

well to moderately well drained
- Houhora sand
- Taeoreia sandy loam and sand

imperfectly to very poorly drained
- One Tree Point peaty sand
- Te Kopuru sand
- Te Kopuru peaty sand
- Ruakaka peaty sandy loam
- Ruakaka fine sandy peat
- Ruakaka loamy peat
- Ruakaka peaty silt loam
- Ruakaka peaty fine sandy loam

Soils of the Undulating Terraces and Lowlands

well to moderately well drained
- Kohumaru clay
- Whareora clay loam

imperfectly to very poorly drained
- Kohumaru mottled clay
- Pakotai clay
- Waipuna clay
- Kara sandy loam
- Kara silt loam
- Kara silt loam with pan
- Kara peaty silt loam
- Kara clay
- Otonga peaty clay loam
- Otonga loamy peat
- Waipu sand
- Waipu clay
- Waipu peaty silt loam and peaty clay

Soils of the Rolling and Hilly Land

well to moderately well drained
- Ohaeawai silt loam
- Ohaeawai shallow bouldery silt loam
- Waiotu friable clay
- Pukeatua friable clay
- Bream clay loam
- Taumata clay loam
- Mangonui clay
- Hauoha complex (stones to boulders)
- Marua brown clay loam
- Marua clay loam
- Marua light brown clay loam
- Aotea clay loam and silty clay loam
- Huruhe stony clay loam
- Rangiora clay
- Awarere clay loam
- Tutamoe friable clay
- Pukepo gravelly silt loam
- Whatitiri clay loam
- Maungaroa clay
- Omanaia clay loam
- Waiotira clay loam
- Omatara clay

Soils of the Rolling and Hilly Land (ctd.)

well to moderately well drained (ctd.)
- Omu clay loam
- Omaiko gravelly silt loam

imperfectly to very poorly drained
- Otangarei clay and sandy clay loam
- Waiotea clay
- Aurea clay
- Konoti clay loam
- Konoti clay
- Aponga clay
- Rangiora clay, clay loam and silty clay loam
- Ruparo clay and sandy clay
- Ruparo sandy clay loam and sandy loam
- Awarere clay and sandy clay
- Awarere fine sandy loam and sandy clay
- Wairau clay loam and silt loam
- Pukemiro sandy loam
- Otoru fine sandy loam
- Whaka clay loam
- Omanaia clay loam with coarse-structured subsoil
- Te Ore clay loam
- Okaka clay and silty clay
- Purua clay
- Waikare silt loam
- Omaika gravelly silt loam with pan
- Hukerenui gravelly silt loam
- Hukerenui sandy loam
- Hukerenui fine sandy loam
- Hukerenui silt loam
- Hukerenui silt loam with pan
- Pukenamu silt loam
- Motatau clay
- Rockvale clay
- Wharekohe sandy loam
- Wharekohe sandy loam with pan
- Wharekohe fine sandy loam
- Wharekohe fine sandy loam with pan
- Wharekohe silt loam
- Wharekohe silt loam with pan
- Parahaki fine sandy loam and silt loam
- Parahaki fine sandy loam and silt loam with pan
- Areoclue clay

Soils of the Steeplands

excessively to somewhat excessively drained
- Huia steepland soils, stony silt loam

well to moderately well drained
- Hare steepland soils, stony clay and stony silt loam
- Te Kie steepland soils, stony clay loam
- Te Kie steepland soils, light brown stony clay loam
- Te Kie steepland soils, reddish clay loam
- White Cone steepland soils, sandy clay loam
- Te Rango steepland soils, clay loam and stony clay loam
- Te Rango steepland soils, light brown clay loam and stony clay loam

imperfectly to very poorly drained
- Pukekaroro steepland soils, clay loam

- Drifting and/or recently stabilised sands
- Wet swamps (not investigated)
- Hill soils
- Steepland soils
- Mottled soils
- Gravelly soils
- Bouldery soils
- Soil boundary

NEW ZEALAND LAND INVENTORY

SCALE 1 : 100 000

Metres 1000 0 1 2 3 4 5 6 7 8 Kilometres

REFERENCE

- Cities
- Towns
- Settlements
- State Highways
- Other roads
- Tracks
- Railways
- Rivers and streams
- Trig stations
- Villages – (sep. rate places) under same ownership
- Land holding boundaries
- Sand and mud

The map is drawn on the New Zealand Map Grid Projection, a conformal-minor orbitonal projection. The grid is the New Zealand Map Grid, showing coordinates in metres in terms of the Geodetic Datum 1949, based on the International (Hayford) Spheroid.

HEIGHTS ARE IN METRES ABOVE MEAN SEA LEVEL

The smallest area mapped is generally not less than 10 hectares. Calculation of areas from this map should be within the limitations of scale. For example, individual areas should be rounded to the nearest 5 hectares. Accumulated areas should be rounded to the nearest 50 hectares.

AREAL SCALE

500 hectares divided into units of 25 hectares

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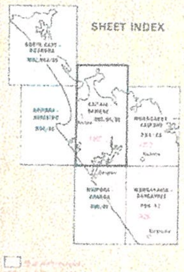


Published by the Department of Lands and Survey, New Zealand under the authority of I.F. Stirling, Surveyor-General.

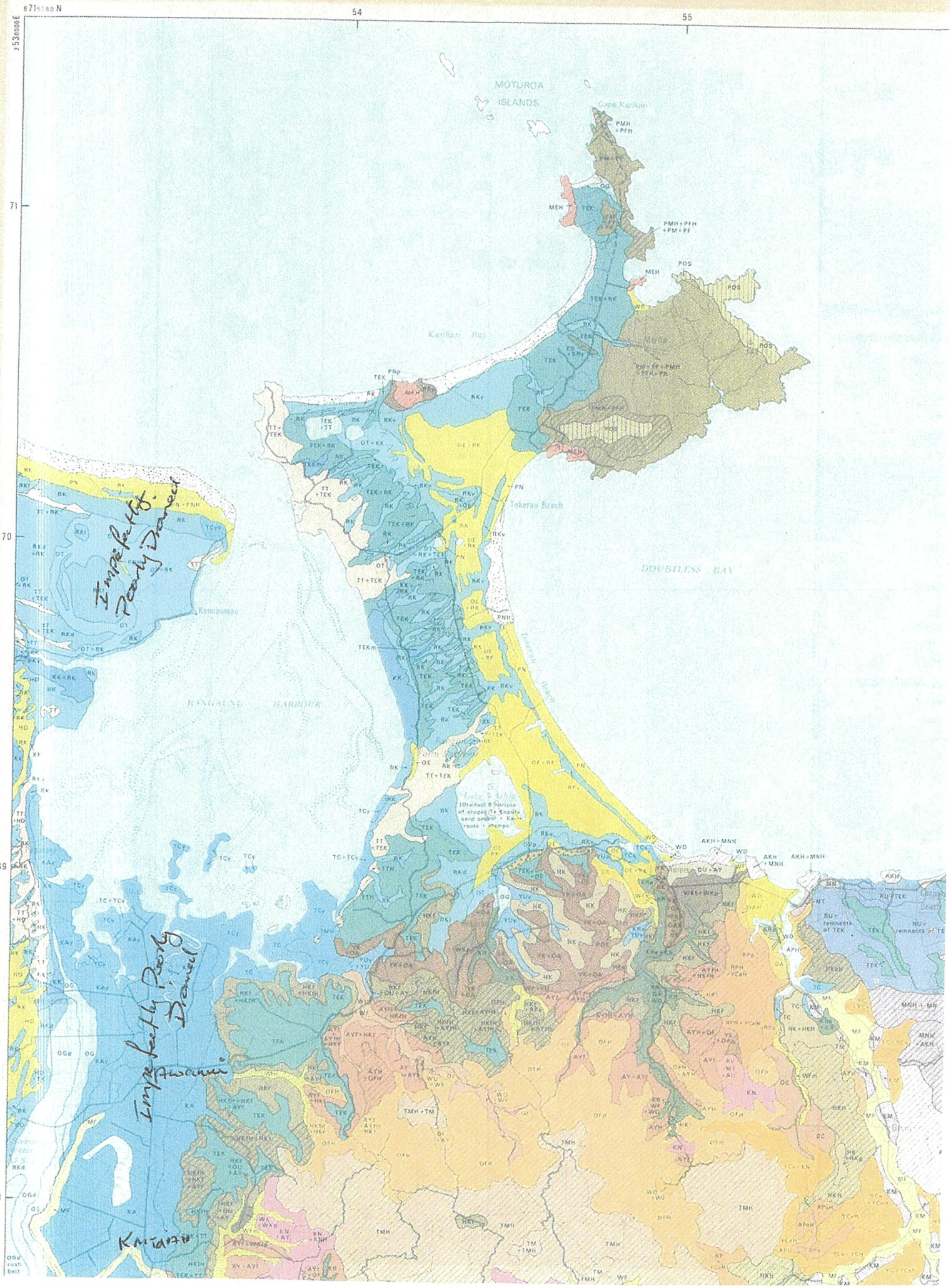
P.D. Hasselberg, Government Printer, Wellington, New Zealand.

COMPILATION NOTE – The base map is compiled from the NZMS 1 series (1:63360) dated 1971, 72, 75, 77.

EDITION 1 1980

This map is one of 5 series. Themes mapped in this study are: Land Tenure and Holding; Rock Types and Surface Deposits; Soils; Existing Land Use; Wildlife.

KAITAIA–RAWENE



Soakage pit design (example 1)

Total pit space

using Ksat m/day	Width	Length	Depth Overall	Depth Cover	Internal depth to overflow outlet pipe invert
0.06	4	2	2	0.3	0.1

Total height to base (inside)	Depth storage below outlet invert	Plan area	Depth below ring	Height of ring below outlet	Height of ring below orifice
1.70	1.60	8.00	0.2	1.40	0.95

Empty space inside pipe ring (below overflow outlet)

Dia. Inside m	Number	Plan area	Ring volume below outlet above orifice inv.	Ring volume below orifice
1.2	2	2.26	1.02	2.15

Empty space outside pipe ring (below overflow outlet pipe)

Rock (60/40, 0.38) void %	Dia. outside m	Outside ring area below outlet above orifice inv.	Outside ring vol. below outlet above orifice inv.	Void volume Outside ring below outlet above orifice inv.
0.38	1.34	5.18	2.33	0.89

Clean Scoria 0.5

Outside ring area below outlet above orifice inv.	Outside ring vol. below orifice	Void volume Outside ring below orifice	Volume below Ring	Void volume below ring	Total Void volume outside ring
5.18	4.92	1.87	1.60	0.61	3.36

Total volume available for storage

Volume m^3	Volume above orifice m^3	24hr flow from my Spreadsheet Qp (m^3/sec)	24hr flow from my Short tube Orifice dia. mm	Pipeline 1:100 Pipe dia. mm	Pipeline 1:200 Pipe dia. mm

6.53	1.90	0.00035	14	22.55	23.05

Input from below (round up)

Soakage

Area wall below outlet above orifice inv.	Reduction due to orifice flow	Reduction due 6hr orifice outflow	Area wall below outlet above orifice inv.	Soakage /24hrs below outlet above orifice inv. (m^3)/day
5.40	0.5	0.25	0.68	0.04

Area wall below orifice inv.	Total Area below orifice inv.	Soakage /24hrs below orifice inv. (m^3)/day	Total soakage Per 24hrs (m^3)/day
9.20	17.20	1.03	1.07

Total volume available over 24hrs combining soakage & storage (including FOS)

Soakage area FOS	below orifice inv. FOS adjust(m^3)/day	above orifice inv. FOS adjust(m^3)/day	Storage (m^3)/day	Volume m^3
1.2	0.86	0.03	6.53	7.42

Total volume required (from my 24hr attenuation spreadsheet) over 24hrs

Volume m^3
18

Additional storage required over 24hrs

Volume m^3
10.58

Total volume available over 24hrs combining soakage & storage (including soakage FOS)
For varying Ksat

Ksat (m)/day	below orifice inv. FOS adjust(m^3)/day	above orifice inv. FOS adjust(m^3)/day	Storage (m^3)/day	Total Volume m^3	Shortfall Volume m^3
0.06	0.86	0.03	6.53	7.42	10.58
0.12	1.72	0.07	6.53	8.32	9.68