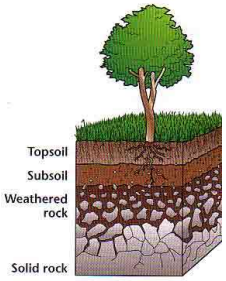

Mansfield Land Capability & Soil Assessments

P.O. Box 623
Mansfield 3722
Phone:
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LAND CAPABILITY ASSESSMENT

Report No L36322

Amended 2023

Client:

Site Address: 399 Maintongoon Road, Maintongoon, 3714.

Figure 1: Proposed effluent disposal area viewed from north west to south east as on the 21st of July 2022.

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1. INTRODUCTION

Mansfield Land Capability & Soil Assessments has been engaged to undertake a Land Capability Assessment (LCA) by Hylke Kijlstra from Helico Australia for a site at 399 Maintongoon Road, Maintongoon, 3714.

The field visit and report have been undertaken and entirely carried out by Adam Layfield and Emma Layfield, we have the required professional indemnity insurance. The field testing included soil profile logging and sampling, laboratory testing, water and nutrient balance modelling and risk assessment has revealed that on-site effluent disposal is appropriate and sustainable.

Our submission will provide information about the site and soil conditions. It will also provide a detailed LCA and include a conceptual design for suitable onsite wastewater management, including recommendations for monitoring and management requirements.

The subject allotment is a 24.91ha property located approx. 5.5km from the township of Alexandra, the property is currently used for farming and lifestyle purposes. The allotment has an existing dwelling and shed, Hylke is the director of a company known as Helico Australia, this company specialises in helicopter repairs and servicing. Hylke proposes to construct two workshops and a maintenance office & parts shed located in a large paddock approx. 330m north-east of the existing dwelling. The proposed development will require a septic system to service the staff amenities in the workshops. The company employees a maximum of 20 staff however with the development of the company they may have up to 40 staff employed in the future. The septic system will be a primary treatment system and the wastewater loading has been calculated based on the maximum of 40 staff.

2. DESCRIPTION OF DEVELOPMENT

Site address:	399 Maintongoon Road, Maintongoon, 3714.
Parcel Details:	Allot. 60A1 PP2009 (Refer to Appendix C.)
Owners:	
Email address:	
Phone:	
Vic Roads directory reference:	62 D4
Local Government Authority:	Murrindindi
Council property number:	2174
Allotment area:	24.91ha
Planning Zone:	Farming Zone (FZ) Schedule to the Farming Zone (FZ)
Planning Overlay:	None affecting this land. **Refer to Appendix F**
Catchment Area:	The site is not in a Special Water Supply Catchment area.

3. INVESTIGATION METHOD

Our report is in accordance with the current Code of Practice - *Onsite Wastewater Management, E.P.A.* Publication 891.4, *Land Capability Assessment for Onsite Domestic Wastewater Management*, E.P.A. Publication 746.1, *AS/NZS 1547:2012 and the Murrindindi Domestic Wastewater Management Plan 24-8-2020.*

Our capability assessment involved investigating and reporting on climate, slope, aspect, vegetation, soil profile characteristics, proximity to surface waters and escarpments, transient soil moisture characteristics and hydraulic conductivity.

Exploratory excavating was undertaken and a test pit was dug to a depth of 1m as shown in Appendix E.

Soil permeability tests within the proposed effluent disposal area (LAA) were conducted using the constant head permeameter testing method in accordance with AS/NZS 1547:2012 as shown in Appendix D.

Water and nutrient balance analyses were based on the mean rainfall (redistribution of rainfall 9th Decile) recorded by the Alexandra weather station No 88007 and mean evaporation data for Lake Eildon. The rainfall and evaporation data were obtained from the National Climate Centre, Bureau of Meteorology. The data was subsequently analysed and applied to our water and nutrient balance analyses.

4. CAPABILITY ASSESSMENT

Slope and Aspect
The allotment varies from flat to undulating, there is a large decline in the land towards the north west corner which then levels out to flat land towards Johnson Creek. Johnson creek runs along the north west boundary approx. 200m away from the proposed effluent disposal area (LAA). The proposed LAA is located on flat land approx. 5-10m north west of the proposed workshops and approx. 88m of the south east boundary. The land slopes <2.5% in varying directions and is exposed to winds and full sunshine throughout the year. Refer to figure 1 & Appendix D.

Slope Stability
The ground slopes stability within the proposed LAA is unlikely to be compromised by hydraulic loadings or slope degree due to the soil structure.

Climate
The general area receives a mean annual rainfall of 710.5mm and the redistribution of rainfall (90th percentile) of 878.3mm and a mean annual evaporation of 1156mm.

Vegetation
The proposed LAA is vegetated with a mixture of dense pasture grasses including rye grass, as shown in Figure 1 and Appendix D.

Subsurface Profile
The general subsurface profile consists of;
- A-horizon; layer of dark brown, sandy silt (loam), with a soil reaction trend of 5.53 pH and electrical conductivity of 0.12 dS/m, to a depth of 120mm

- B_1-horizon; layer of brown, sandy silty clay (Clay loam), with a soil reaction trend of 5.52 pH and electrical conductivity of 0.15 dS/m, between the depths of 120-430mm

- B_2-horizon; layer of yellow-orange-brown, sandy silty clay (Light clay), with a soil reaction trend of 5.50 pH and electrical conductivity of 0.17 dS/m, between the depths of 430-1000mm.

The soil horizon profile can be seen in Appendix E.

Soil Permeability
The soil profiling tests were conducted on the 21st of July 2022.
Constant head permeameter tests were undertaken and prepared in accordance with AS/NZS 1547:2012 as shown in Appendix D.

Profile analysis in accordance with Table 5.1 in AS/NZS 1547:2012, EPA Code of Practice, Table 9- Appendix A and our laboratory determined swell potential shows the B-horizon clay soils to be moderately structured Clay Loam with an indicative permeability (Ksat) in the range of 0.5 to 1.5m/day.

The constant head permeameter testing on the 21st of July 2022 resulted in a (Ksat) of .55m/day.

For the moderately structured B-horizon clay loam soils, we have adopted the design loading rate of 10mm/day.

Soil Classification
In accordance with *AS/NZS1547:2012* the soil can be classified as Category 4 soil (clay loam).

Surface Waters
The proposed effluent disposal area slopes <2.5% in varying directions and the nearest drainage line is located at least 100m away to the north west, nearest watercourse (Johnson Creek) is located at least 200m away to the north west and the closest dam is located at least 100m of the proposed effluent disposal area.

Groundwater Bores
There are no groundwater bores within 20m of the proposed effluent disposal area and no visible evidence of groundwater use for domestic purposes within 100m of the proposed effluent disposal area.

Watertable
A test pit was dug to a depth of 1m and there was no sign of shallow groundwater tables visible.

5. LAND CAPABILITY AND CAPABILITY ASSESSMENT TABLE

Land features	Land Capability Risk Rating				Mitigation
	LOW	MEDIUM	HIGH	LIMITING	
Site Drainage: Run off/run on	No actual or potential	Low potential	High Potential	Cut-off drain not possible	N/A
Flooding	Never	<1 in100	>1 in 100 and <1 in 20	<1 in 20	N/A
Proximity to waterway	>100m	70-100	40-70m	<40m	N/A
Proximity to drainage depression	>60m	40-60	<40		N/A
Slope % - Trenches & beds	<5%	5%-10%	10%-15%	>15%	Install trenches along contours.
Slope% - Subsurface Irrigation	~~<10%~~	~~10%-30%~~	~~30%-40%~~	~~>40%~~	N/A
Landslip	No actual or potential	Low potential	Potential	Present	N/A
Groundwater (m)	>2.0	2-1.5	<1.5	Surface	N/A
Compaction	No potential	Moderate	High	Severe potential	Vehicle & livestock barriers required.
Exposure	High sun and wind	Moderate	Low sun and wind		N/A
Landform - AS1547:2000 figure 4.1b2	Convex side slope and plains	Flat ground	Concave side slopes	Floodplains	N/A
Vegetation	Pasture/turf	Sparse grasses	Dense forest		Gypsum required.
Rainfall (mm/yr)	<500	500-750	750-1000	>1000	Refer to water Balance table
Pan evaporation (mm/yr) BOM site 083023	>1250	1000-1250	750-1000	<750	Refer to water Balance table
Fill	No fill			Fill present	N/A
Permeability (m/day)	<0.3	0.3-3	3-5	>5.0	Gypsum required in excavated trenches
Presence of mottling	None	Slight		Extensive	N/A
Coarse fragments %	<10	10-20	>20		N/A
pH	6-8	4.5-6	<4.5, >8		N/A
Emerson aggregate class	4,5,6,8	7	2,3	1	N/A
Free Swell (%)	<30	30-80	80-120	>120	N/A

Note: Site assessments and soil test results are within the colored range.

The above results indicate disposal of effluent is achievable by primary treated effluent and on-site effluent disposal via absorption trench system.

The overall above assessment can be reduced to **medium** due to mitigation measures.

6. RISK ASSESSMENT

Land Feature	Land Capability Risk Rating				Remarks
	LOW	MEDIUM	HIGH	RISK RATING	
Distance to reservoir (km)	>15	2-15	<2	2	Approx. 10.4km to Lake Eildon FSL.
Soil type rating (from LCA assessment table above)	1	2	3	2	Shallow Profile with low hydraulic conductivity of moderately structured soil.
Distance to river (m)	>80	40-80	<40	1	No river within 100m+
Distance to stream (m)	>80	40-80	<40	1	>80m to nearest watercourse.
Distance to drain (m)	>40	10-40	<10	1	>40m to nearest drain/drainage depression.
Lot size (ha)	>10	2-10	0.2-2	1	24.91ha
Density (houses/km^2)	<20	20-40	>40	1	<20 dwellings in the km^2 area.
LCA rating (from LCA assessment table above)	1 (LOW)	2 (MEDIUM)	3 (HIGH)	2	Refer to LCA table above.
System fail rate (%)	<5	5-10	>10	2	Assumed conservative rating due to allotment size.

We have assessed the proposed site using the Edis Risk Assessment, Dr Robert Edis identified major factors which influence the level of risk posed by an on-site system. These factors have a differing level of importance, or weighting, when considered relative to other factors and that the interaction between factors must also be considered.

The individual factors can be rated as;

1. **Low risk** (Rn<2.5) which reflects the range in which there is no expected consequential impact on water quality,
2. **Medium risk** (Rn2.5-5) which reflects the range in which the factor may influence the risk to water quality, though as a minor component of the overall risk, and
3. **High risk** (Rn>5) which represents a significant influence on the risk to water quality.

The Edis risk algorithm weights the major factors appropriately in the context of protecting the integrity of the potable water supply, as shown below:

Formula $R_n = ((R_{Res} + R_{Soil}) \times (R_{Riv} + R_{Str} + R_{Drain} + R_{Lot}) + (2 \times R_{LCA}) + (3 \times (R_{Fail} + R_{Den}))/10$
Where
R_n = Combined Risk Number,
R_{Res} = Distance to reservoir risk rating
R_{Soil} = Soil risk rating
R_{Driv} = Distance to river risk rating
R_{Dstr} = Distance to stream risk rating
R_{Drain} = Distance to drain risk rating
R_{Lot} = Lot size risk rating
R_{LCA} = Land capability assessment risk rating
R_{Fail} = System fail rate risk rating
R_{Dens} = Density of development risk rating

The combined risk number for this site is **2.7 (Medium Risk)**

7. WATER LOADING and NUTRIENT BALANCES

Nominated Area Water Balance & Storage Calculations

Site Address: 399 Maintongoon Road, Maintongoon

Notes: This water and nutrient balance is carried out in accordance with the MAV Model LCA

INPUT DATA				NOTES
Design Wastewater Flow	Q	800	L/day	Based on 40 staff @20L/p/day, with full water-reduction fixtures (from EPA Code of Practice 891.4 Table 4)
Design DLR	DLR	0.55	m/day	Assumes Clay Loam soil structure, DLR taken from AS/NZS 1547:2012, Table 5.2.
Daily DLR		10.0	mm/day	Assumes Clay Loam soil structure, DLR taken from AS/NZS 1547:2012, Table 5.2.
Nominated Land Application Area	L	349	m^2	Used for iterative purposes (if desired) to determine storage requirements for nominated areas.
Crop Factor	C	0.45-0.7	unitless	Estimates evaporatranspiration as a fraction of pan evaporation; varies with season and crop type
Retained Rainfall	Rf	0.8	unitless	Proportion of rainfall that remain onsite and infiltrates, allowing for any runoff
Rainfall Data	Station 088001			Alexandra site
Evaporation Data	Station 088023			Eildon site.

Parameter	Symbol	Formula	Units	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Days in month	D	\	days	31	28	31	30	31	30	31	31	30	31	30	31	365
Rainfall 9th decile	R	\	mm/month	48	38	58	68	88	102	106	112	98	94	82	62	**956.0**
Evaporation	E	\	mm/month	173	159	121	76	44	31	33	53	68	105	130	163	**1156**
Crop Factor	C			0.70	0.70	0.70	0.60	0.50	0.45	0.40	0.45	0.55	0.65	0.70	0.70	
OUTPUTS																
Evapotranspiration	ET	ExC	mm/month	121	111	85	46	22	14	13	24	37	68	91	114	**746.45**
Percolation	B	(DPR/7)xD	mm/month	310.0	280	310.0	300.0	310.0	300.0	310.0	310.0	300.0	310.0	300.0	310.0	**3650.0**
Outputs		ET+B	mm/month	431.1	391.3	394.7	345.6	332.0	314.0	323.2	333.9	337.4	378.3	391.0	424.1	**4396.5**
INPUTS																
Retained Rainfall	RR	RxRf	mm/month	38.4	30.4	46.4	54.4	70.4	81.6	84.8	89.6	78.4	75.2	65.6	49.6	**764.8**
Effluent Irrigation	W	(QxD)/L	mm/month	71.1	64.2	71.1	68.8	71.1	68.8	71.1	71.1	68.8	71.1	68.8	71.1	**836.7**
Inputs		RR+W	mm/month	109.5	94.6	117.5	123.2	141.5	150.4	155.9	160.7	147.2	146.3	134.4	120.7	**1601.5**
STORAGE CALCULATION																
Storage remaining from previous month			mm/month	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Storage for the month	S	(RR+W)-(ET+B	mm/month	-321.6	-296.7	-277.2	-222.4	-190.5	-163.6	-167.3	-173.2	-190.2	-232.0	-256.6	-303.4	
Cumulative Storage	M		mm	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Maximum Storage for Nominated Area	N		mm	0.00												
	V	NxL	L	0												
LAND AREA REQUIRED FOR ZERO STORAGE			m^2	63	62	71	82	95	103	104	102	93	82	74	66	

MINIMUM AREA REQUIRED FOR ZERO STORAGE: 104.0 m^2

Nutrient Balance

Site Address: 399 Maintongoon Road, Maintongoon

Please read the attached notes before using this spreadsheet.

SUMMARY - LAND APPLICATION AREA REQUIRED BASED ON THE MOST LIMITING BALANCE = 349 m^2

INPUT DATA [1]

Wastewater Loading			Nutrient Crop Uptake				
Hydraulic Load	800	L/Day	Crop N Uptake	220 kg/ha/yr	which equals	60	$mg/m^2/day$
Effluent N Concentration	30	mg/L	Crop P Uptake	50 kg/ha/yr	which equals	14	$mg/m^2/day$
% Lost to Soil Processes (Geary & Gardner 1996)	0.2	Decimal	**Phosphorus Sorption**				
Total N Loss to Soil	13.753582	$mg/m^2/day$	P-sorption result	250 mg/kg	which equals	3375	kg/ha
Annual N loss to Soil	1.75	kg/year	Bulk Density	1.5 g/cm^2			
Effluent P Concentration	10	mg/L	Depth of Soil	0.9 m			
Design Life of System	50	yrs	% of Predicted P-sorp. [2]	0.5 Decimal			

NUTRIENT BALANCE BASED ON ANNUAL CROP UPTAKE RATES

Minimum Area required with zero buffer		
Nitrogen	319	m^2
Phosphorus	349	m^2

Determination of Buffer Zone Size for a Nominated Land Application Area (LAA)		
Nominated LAA Size	349	m^2
Predicted N Export from LAA	-5.93	kg/year
Predicted P Export from LAA	0.00	kg/year
Phosphorus Longevity for LAA	50	Years
Minimum Buffer Required for excess nutrient	0	m^2

PHOSPHORUS BALANCE

STEP 1: Using the nominated LAA Size

Nominated LAA Size	349	m^2			
Daily P Load	0.008	kg/day	→ Phosphorus generated over life of system	146	kg
Daily Uptake	0.004781	kg/day	→ Phosphorus vegetative uptake for life of system	0.250	kg/m^2
Measured p-sorption capacity	0.3375	kg/m^2			
Assumed p-sorption capacity	0.169	kg/m^2	→ Phosphorus adsorbed in 50 years	0.169	kg/m^2
Site P-sorption capacity	58.89	kg	→ Desired Annual P Application Rate	2.923	kg/year
			which equals	0.00801	kg/day
P-load to be sorbed	1.18	kg/year			

The Nutrient balance table requires 349m^2

8. SIZING CACULATIONS

Victorian Land Capability Assessment Framework January 2014

Victorian Land Capability Assessment Framework

Trench & Bed Sizing

FORMULA FOR TRENCH AND BED SIZING				
L = Q/DLR x W			From AS/NZS 1547:2012	
Where:	Units			
L = Trench or bed length	m		Total trench or bed length required	
Q = Design Wastewater Flow	L/day		Based on maximum potential occupancy and derived from Table 4 in the EPA Code of Practice (2016)	
DLR = Design Loading Rate	mm/day		Based on soil texture class/permeability and derived from Table 9 in the EPA Code of Practice (2016)	
W = Trench or bed width	m		As selected by designer/installer	
INPUT DATA				
Design Wastewater Flow	Q	800	L/day	Based on maximum potential occupancy and derived from Table 4 in the EPA Code of Practice (2016
Design Loading Rate	DLR	10.0	mm/day	Based on soil texture class/permeability and derived from Table 9 in the EPA Code of Practice (2016)
Trench basal area required	B	80.0	m^2	
Selected trench or bed width	W	0.7	m	As selected by designer/installer
OUTPUT				
Required trench or bed length	L	114.3	m	
Adopted length		120	m	

CELLS

	Please enter data in blue cells
XX	Red cells are automatically populated by the spreadsheet
XX	Data in yellow cells is calculated by the spreadsheet, DO NOT ALTER THESE CELLS
XX	Recommended trench lenght

The above table is used to show the required trench length using the 'MAV Model Land Capability Assessment'.

The effluent absorption trench area has been determined from the results of the water and nutrient balance analyses, Victorian Land Capability Assessment Framework January 2014 and AS/NZS 1547:2012, Appendix M.

9. RECOMMENDATIONS

The following recommendations are based on the results of our assessment and are made in accordance with the *Code of Practice - Onsite Wastewater Management,* E.P.A. Publication 891.4, M.A.V. Model Land Capability Assessment Report and *AS/NZS 1547:2012*.
They are based on the limiting clay materials, wastewater load and are designed to demonstrate the viability of on-site effluent disposal of 800 litres per day.

EFFLUENT DISPOSAL

General

Based on the results of the water and nutrient balance analysis, sub-soil conditions including soil profile, constant head permeameter testing, slope and adequate site drainage, on-site sub-soil absorption trenches are appropriate for effluent disposal.

Effluent

The effluent generated from the proposed development will be black and grey water classed as 'all waste' and will be treated using a minimum sized 3200 litre dual chamber septic tank and sub-soil absorption trenches.

Domestic Water Supply

Onsite roof water collection only and no reticulated water supply are available on this allotment.

Anticipated Wastewater Load

Design wastewater load is calculated based on a factory/office for a maximum number of 40 staff therefore 40 x 20L/person/day = 800L/day. This design is sourced from the Code of Practice - Onsite Wastewater Management, E.P.A. Publication 891.4, table 4 and adopts 20L/person/day as a factory/office. Refer to Appendix B.

Sub-soil Absorption Trenches
The effluent disposal area and application rate has been determined from the results of the constant head permeameter tests, water and nutrient balance analyses and *AS/NZS 1547:2012.*

General Requirements
For primary treated effluent, it is assumed that the design, construction, operation and maintenance are carried out in accordance with *AS/NZS1547:2012,* Code of Practice - Onsite Wastewater Management, EPA Publication 891.4 and Council Permit to Install/use.

Ground Preparation and Excavations
It is recommended that gypsum be broadcasted over the bottom of the excavated effluent absorption trenches prior to the installation of the slotted pipe at the rate of 1kg/m^2. Effluent absorption trenches shall not be backfilled with clay or heavy soil, use topsoil (Loam). Effluent absorption trenches shall be installed along the contours and not exceeding 400mm in depth or 30m in length with a minimum of 2m separation between trenches.

Septic Tank Installation
Septic tank to be installed in natural soils (not fill), primary inspection opening brought up to ground-surface level with inspection shaft cover, and after installing a septic tank it must be two-thirds filled with clean water to provide ballast in the tank and prevent groundwater lifting the tank out of the ground.

Pump Well Installation
Pump well to be installed in natural soils (not fill) and opening brought up to ground-surface level and after installing the pump well, it must be two-thirds filled with clean water to provide ballast in the well and prevent groundwater lifting it out of the ground. Installation of a high-water level alarm must be installed in the pump well to advise the owner of any pump failures.

Landscaping and Maintenance
On completion of trench installation, the area will require seeding of clover and rye grass seed mixture to assist in the nitrogen uptake. The area should be mowed frequently to increase grass growth rate, which again will assist in the nitrogen uptake.

Inspections and Monitoring
The ‘permit to use’ issued by the local council should state the required inspection periods.
I recommend that the septic tank is inspected every 3 years and a septic report be issued to the local council to ensure the ongoing effectiveness of the system.

Reserve Area
There is sufficient available area on the allotment for alteration of the effluent disposal area if required.

Site Drainage
A cut-off drain is not required as the slope is less than 2.5%.

Site Compaction
As the proposed effluent disposal area is in a paddock that maybe grazed by livestock, and on an undulating area which could be driven over by tractors or other vehicles, it must be fenced to prevent all vehicles and livestock from causing compaction or damage to the area.

Setback Distances
All setbacks referred to in Table 5- Code of Practice – Onsite Wastewater Management, E.P.A. Publication 891.4 are achievable using primary treatment.

Permit to Install Septic Tank
Before any work commences, a Permit to Install a septic tank system will be required from the local Shire Council for all wastewater generated on the premises.

SUMMARY OF RECOMMENDATIONS
The capability and risk assessment indicate that primary effluent and trench systems are appropriate for this development and sufficient space exists for retention of all wastewater on the allotment and is achievable by using the principle of absorption trenches after primary treatment. The precautionary principle requires water conservation, treatment and dispersal at a rate where the impact from nutrient will not adversely affect vegetation.
This assessment concludes the proposal for on-site wastewater management system to be sustainable, with minimal risk to human health as required by state environment protection policies.

10. CONCLUSION

We have assessed the development site and proposed effluent disposal area for existing and potential risks. The Edis risk algorithm has a combined risk assessment rating of **2.7 (Medium Risk).**

We recommend installing a 3200L all waste septic tank with a 740L pump well to transfer the primary treated effluent to the proposed LAA and via a total of **120m (4 x 30m)** effluent absorption trenches. The trenches to be .7m wide with a minimum of 2m separation and installed along the contours not exceeding 400mm in depth or 30m in length (refer to appendix H). The pump well will require a high water level alarm and a suitable pump to transfer the effluent maintaining adequate head pressure e.g. Davey D42 or similar.

The overall designs are conservative as they take into consideration the limiting factors of the site and potential volume of wastewater and will provide a further increase in confidence that the system will be able to contain all wastewater.

11. MANAGEMENT PROGRAMME

Wastewater treatment systems serving the proposed development must comply with the EPA conditions indicated in approval conditions or equivalent.

To ensure for the most effective use of any effluent system the following measures are recommended:

For best practice:

1. all trenches to be monitored for signs of any surcharge or seepage;
2. a sink strainer to be used to catch food particles;
3. a front-loading washing machine be used when possible;
4. surge loads be avoided (letting out large volumes of water at the same time);
5. use biodegradable soaps;
6. environmentally-friendly, low-phosphate laundry products to be used;
7. scrape all dishes to remove grease and fats before washing;
8. do not install a garbage grinder waste disposal system;
9. do not allow sanitary napkins or hygiene products to enter the system;
10. do not dispose of aggressive toxic cleaning agents in the system;
11. do not dispose of any solvents or paints in the system;
12. do not allow bleach, whiteners, nappy soakers, spot removers or disinfectants to enter the system;
13. water saving devices should be used where practicable, eg: shower head, aerator on sink outlet, pressure regulating valve;

14. if a spa or insinkerator is to be installed, additional trench length(s) shall be added to the system;

15. the plumber installing the system shall lodge a Plumbing Industry compliance certificate and as-laid drainage plan to the local Council on completion of the works.

12. ***REFERENCES***

AS/NZS 1547:2012 On-site domestic wastewater management
Environment Protection Act 1970 (Victoria)
EPA Victoria (1996), *Code of Practice – Septic Tanks (Publication 451)*
EPA Victoria (2003), *Septic Tanks Code of Practice (Publication 891)*
EPA Victoria (2003), *Land Capability Assessment for Onsite Domestic Wastewater Management (Publication 746.1)*
EPA Victoria (2016), *Code of Practice – Onsite Wastewater Management (Publication 891.4)*
Municipal Association of Victoria (2006), *Model Land Capability Assessment Report,* MAV & DSE
Land Capability Assessment for On-site Wastewater Management 2010- Joe Whitehead
Murrindindi Domestic Wastewater Management Plan 24-8-2020.

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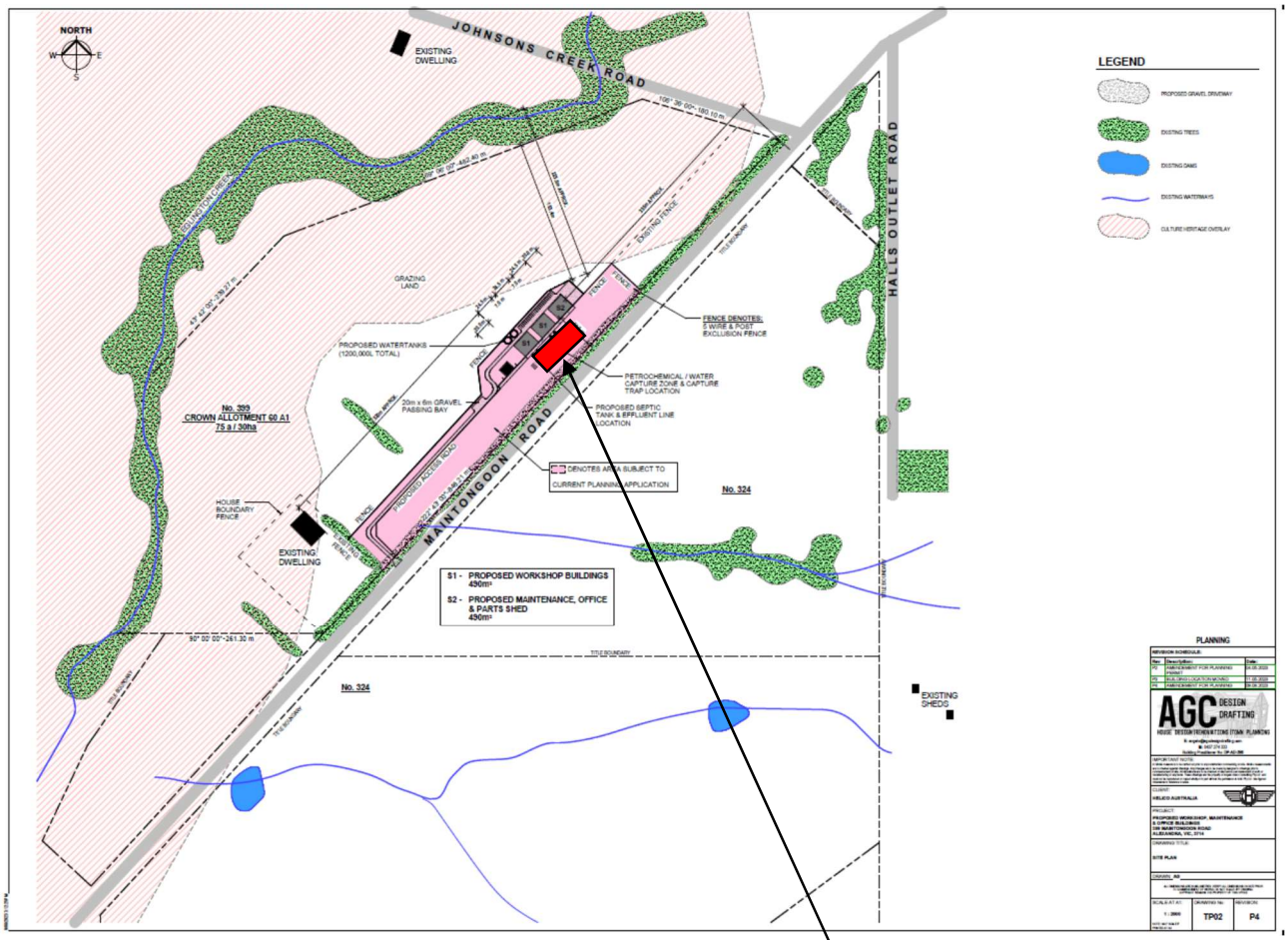
Foundation and Footings Society (Vic) Inc. (FFSV)
Victorian Building Authority Licence No 32561

Mansfield Land Capability & Soil Assessments
9th August 2023.

Appendix A

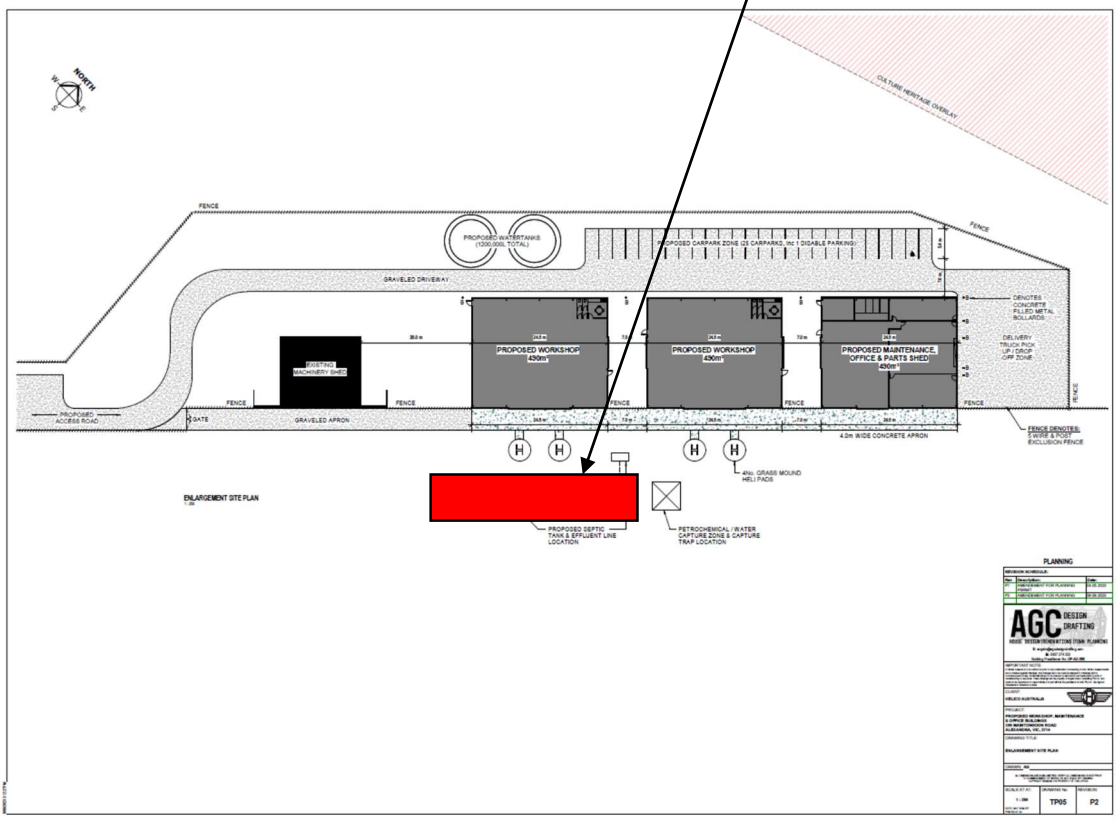
Site Plan

Not to Scale



Proposed LAA

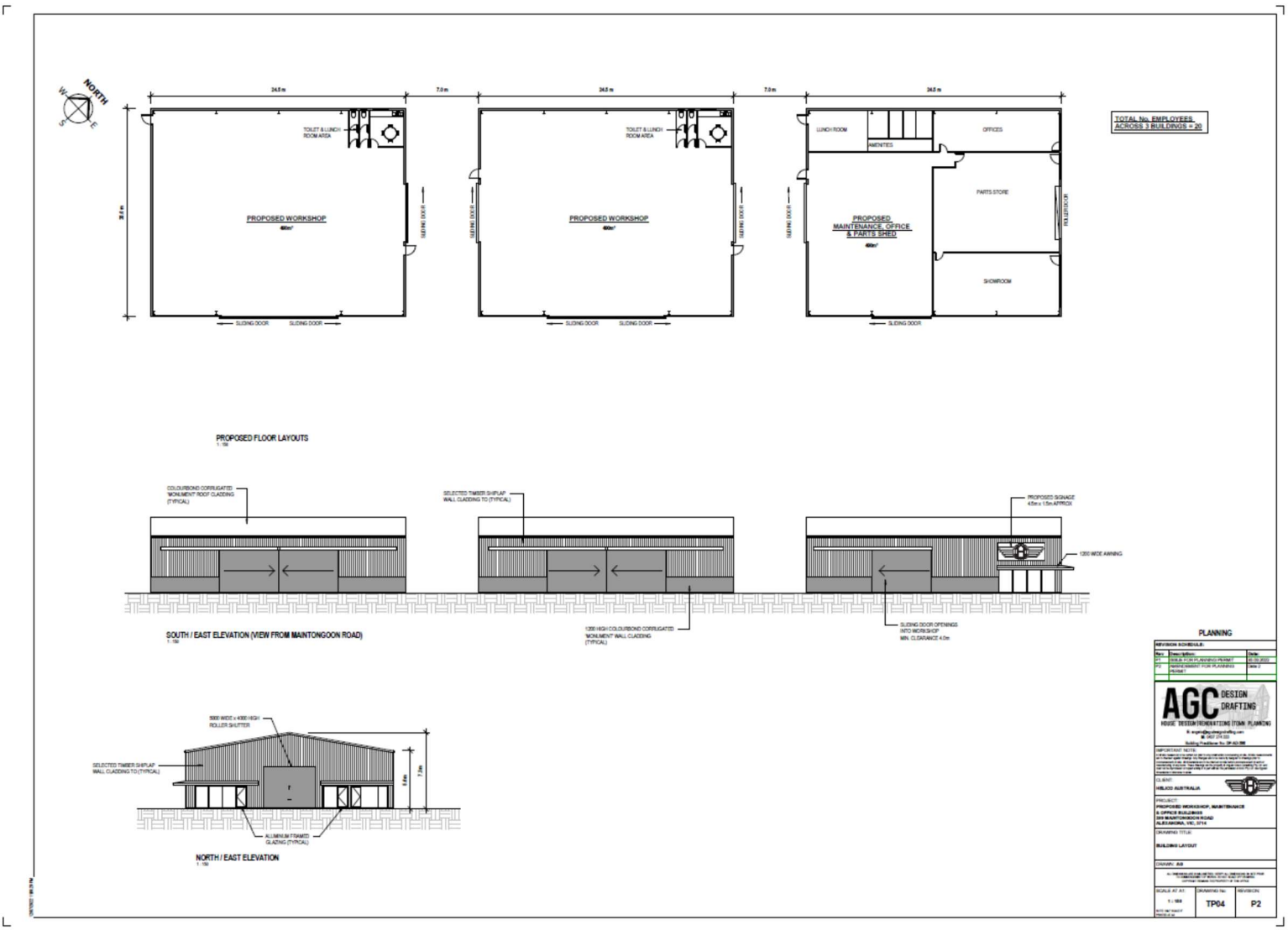
Enlarged Plan



Appendix B

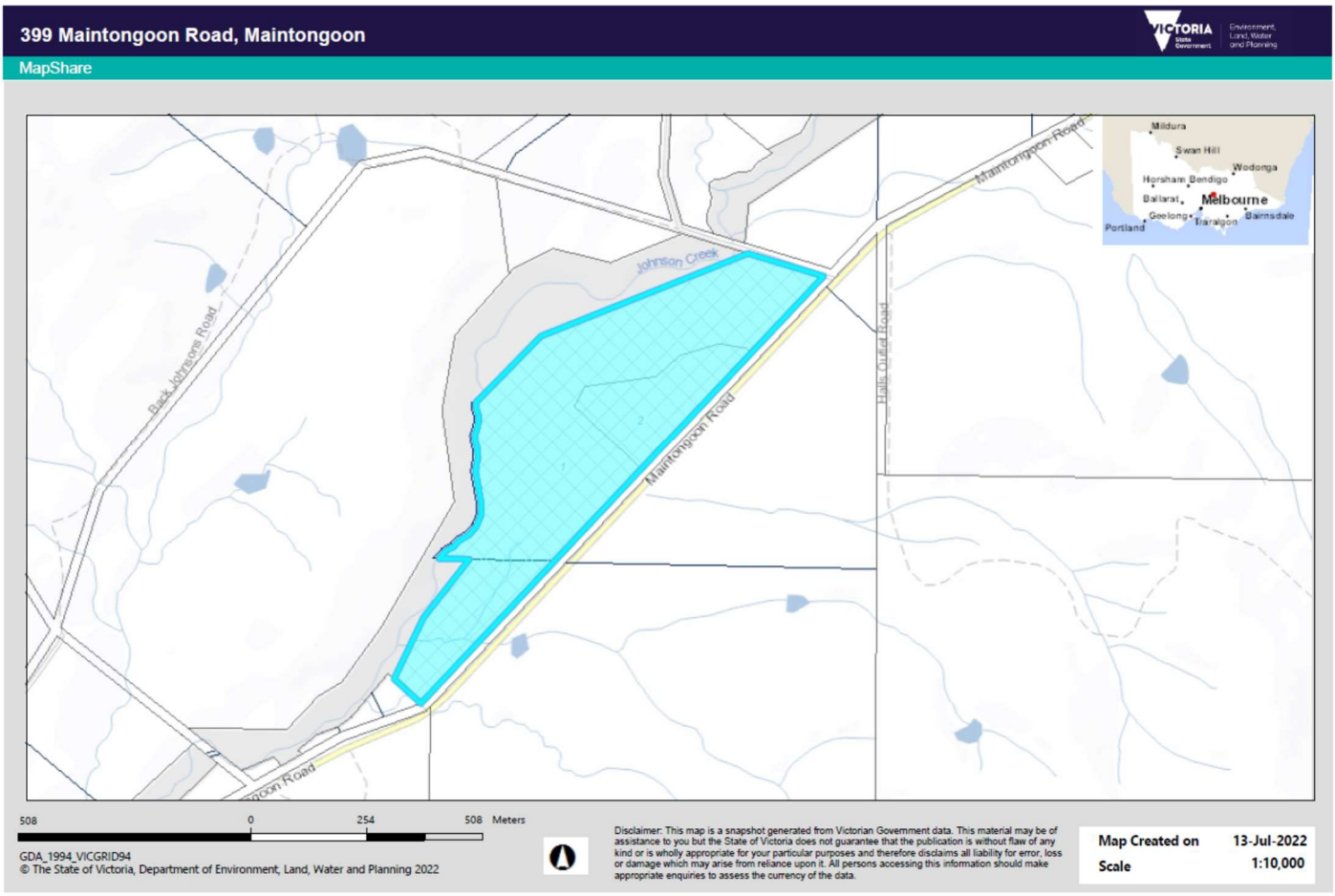
Floor Plan

Not to Scale



Appendix C

Map from DELWP of 399 Maintongoon Road, Maintongoon



Appendix D

Photo of constant head permeameter test conducted on the 21st of July 2022.

Appendix E

Soil Horizon.

Appendix F

PROPERTY REPORT

VICTORIA State Government | Environment, Land, Water and Planning

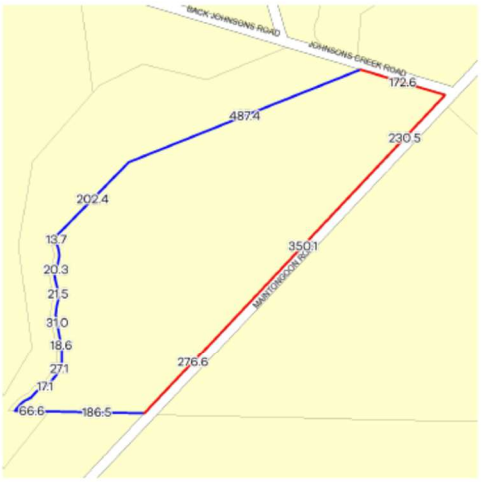
From www.planning.vic.gov.au at 09 August 2023 04:42 PM

PROPERTY DETAILS

Crown Description:	**Allot. 60A1 PARISH OF ALEXANDRA**
Address:	**399 MAINTONGOON ROAD MAINTONGOON 3714**
Standard Parcel Identifier (SPI):	**60A1\PP2009**
Local Government Area (Council):	**MURRINDINDI** www.murrindindi.vic.gov.au
Council Property Number:	**2174 (Part)**
Directory Reference:	**Vicroads 62 D4**

SITE DIMENSIONS

All dimensions and areas are approximate. They may not agree with those shown on a title or plan.



Area: 249071 sq. m (24.91 ha)
Perimeter: 2362 m
For this property:
Site boundaries
Road frontages

Dimensions for individual parcels require a separate search, but dimensions for individual units are generally not available.

15 overlapping dimension labels are not being displayed

Calculating the area from the dimensions shown may give a different value to the area shown above

For more accurate dimensions get copy of plan at Title and Property Certificates

PARCEL DETAILS

This is 1 parcel of 2 parcels comprising this property.The parcel searched for is marked with an * in the table below

	Lot/Plan or Crown Description	SPI
	PARISH OF ALEXANDRA	
*	Allot. 60A1	60A1\PP2009
	Allot. 60B	60B\PP2009

UTILITIES

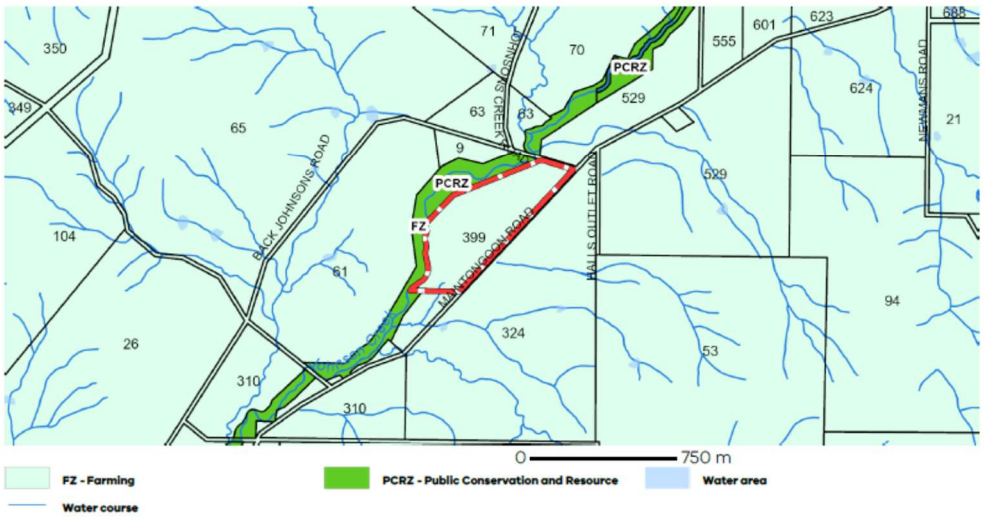
Rural Water Corporation:	**Goulburn-Murray Water**
Urban Water Corporation:	**Goulburn Valley Water**
Melbourne Water:	**Outside drainage boundary**
Power Distributor:	**AUSNET**

STATE ELECTORATES

Legislative Council:	**NORTHERN VICTORIA**
Legislative Assembly:	**EILDON**

Planning Zones

FARMING ZONE (FZ)
SCHEDULE TO THE FARMING ZONE (FZ)



FZ - Farming
PCRZ - Public Conservation and Resource
Water area
Water course

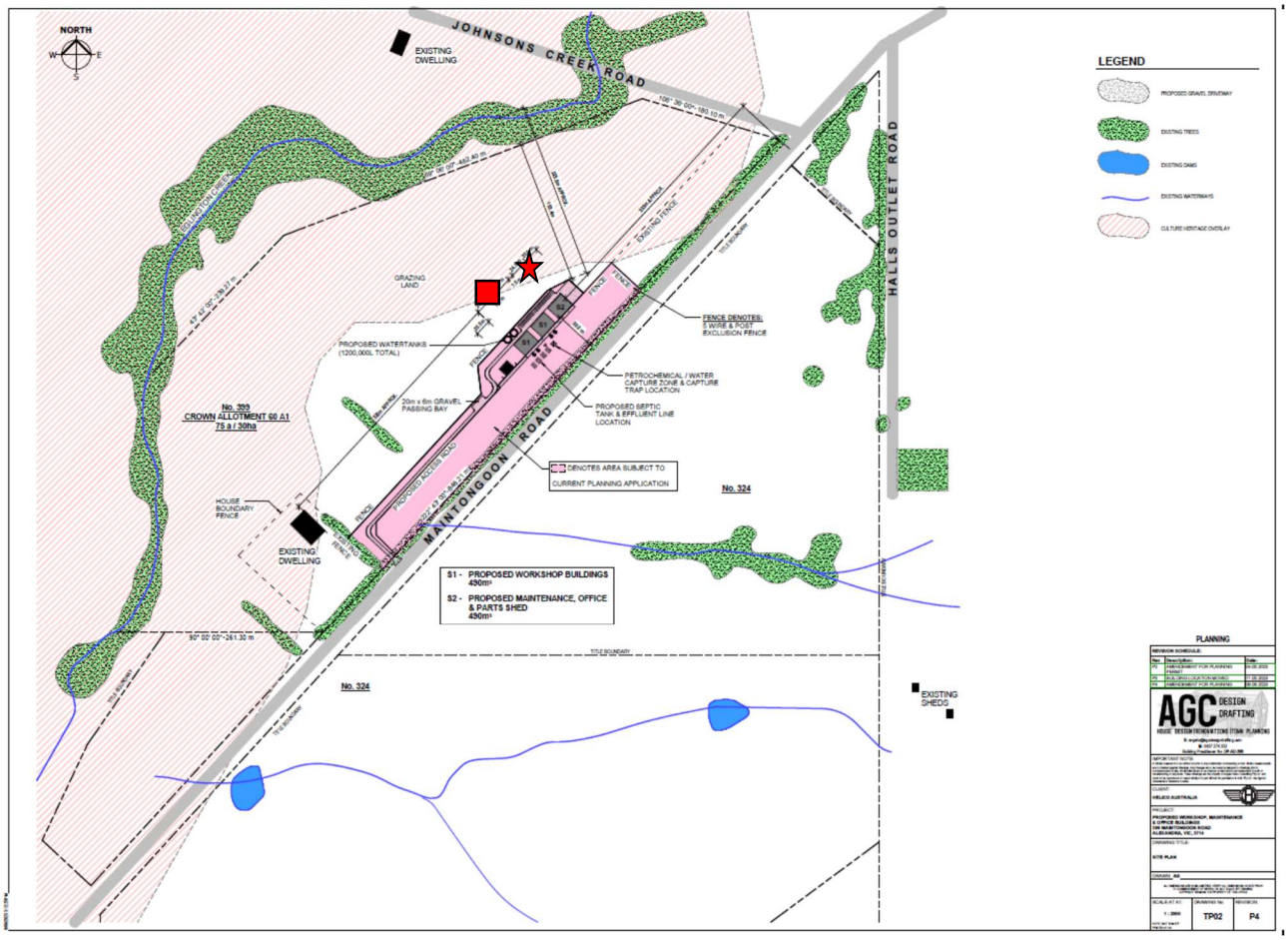
Note: labels for zones may appear outside the actual zone - please compare the labels with the legend.

Appendix G

GPS testing locations

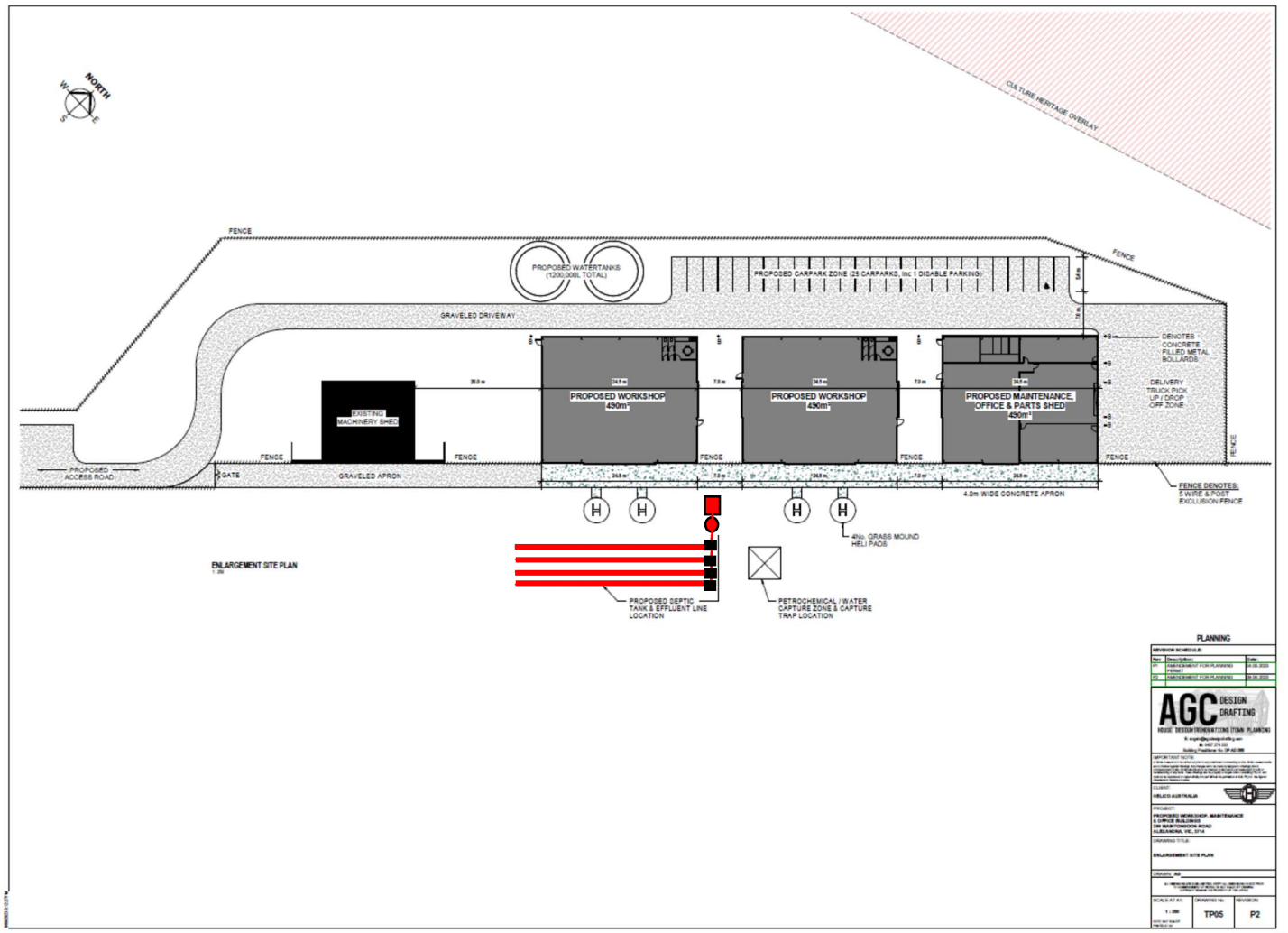
★ Bore Hole – 37. 1542^0 S
145. 7265^0 E

■ Test Pit – 37. 1543^0 S
145. 7265^0 E



Appendix H

Septic Design
Not to scale



3200L septic tank (indicative location)

740L Pump Well (indicative location)

Subsoil Absorption Trench (4 x 30m - Total 120m)

Distribution pit

Appendix I

Effluent absorption trench design