ONSITE WASTEWATER MANAGEMENT PLAN

Lot 1 DP 109606

Princes Highway, Frogshollow

25 October 2017

Prepared for:

Sport Aviation Australia

P.O. Box 752

NSW 2548

Prepared by:

Tasman Engineering Consultants

Project No. S-518

Structural, Civil, Geotechnical & Environmental Engineers

ABN 870 83 813 556

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62 Main Street, Merimbula, NSW
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FIGURES AND TABLES

APPENDICIES

1 INTRODUCTION

1.1 General

At the request of Sport Aviation Australia (Client), Tasman Engineering Consultants (TEC) have prepared an On Site Waste Water Site Assessment for Lot 1, DP 109606, Prices Highway, Frogshollow, NSW. The site and vicinity are shown in **Figure 1- Site Vicinity Map, Appendix A.**

1.2 Project Description

The proposed project consists of a recreational flight school to be located at the Frogshollow Airstrip. At full operation the project is proposed to cater to resident occupancy of 360 students and 200 non-resident staff.

At completion the school will be divided in to 10 squadrons each of which will have a dedicated Ozzi Kleen SK25 A-G sewage treatment plant having a 6000 L/day maximum hydraulic capacity. Each treatment unit would also be equipped with a collection well and a lift pump system which would have a 24 hour holding capacity prior to transferring raw waste water to the treatment plant. It is recommended that each collection well be equipped with a two pump (duty and standby) pumping system controlled by float switches and that the control equipment be designed and installed by a suitably qualified electrician. Recommended equipment specifications are included in **Appendix D**.

The proposed design also includes airplane hangars, and maintenance facilities located on the east side of the runway which will be serviced by two additional treatment plants. The proposed layout of the waste water collection and effluent distribution system is shown in **Figure 2 – Detailed Site Plan, Appendix A**. Plant effluent will be treated to a secondary standard with disinfection. Treated effluent would be pumped to a series of above ground storage tanks which would then provide the water supply for an irrigation network and dedicated firefighting storage. **Figure 3** shows a proposed typical detail for collection and treatment of waste water and storage of treated effluent. Effluent irrigation distribution may be either through a network of irrigation sprinklers or applied directly to the effluent management area (EMA) using mobile distribution system. **Figure 4** shows a concept plan for a system of fixed radius treated effluent irrigation sprinklers located adjacent to the runway.

The development of the project is proposed to be carried out over a period of approximately five years. The project will begin with installation of facilities for two squadrons with an additional squadron added every six months.

1.3 Form of Report

This report has been prepared in general accordance with AS1547-2012 “On Site Domestic Wastewater Management” and Environment and Health Protection Guidelines “On Site Sewage Management for Single Households”. A site inspection including a preliminary visual evaluation of site soils has been used as the basis of this report.

2.0 SITE INFORMATION

2.1 Water Supply

The water supply for the facility may consist of a combination of tank water, bore water, or bottled water as reticulated water is not currently available for the site.

2.3 Wastewater Quantity

Resident occupancy = 360 persons

Non resident occupancy = 200 persons

Design flow at peak resident occupancy [(2)] = 120 L/person/day

Design flow at peak non-resident occupancy [(2)] = 30 L/person/day

Design Daily Flow Allowance = 360 persons x120 L/person/day + 200 x 30 l/person/day = **49,200 litres /day**

3.0 SITE ASSESSMENT

The site assessment presumes that the EMA will be limited to the area of the runway which is an established grass covered surface. The runway is also considered restricted access and therefore exposure to treated effluent used for irrigation would be controlled.

3.1 Climate

Local climate is temperate all year round. Average winter temperatures rarely drop below 5 degrees Celsius and generally are above 10 degrees during the day. The average yearly rainfall total based on published data is **624 mm** annually. Rainfall information used in the assessment consists of Decile 7 monthly precipitation data interpolated from Bureau of Meteorology data for the Bega AWS station 069139. Evaporation information is based on data taken from Australian Rainfall & Runoff evaporation maps.

3.2 Land Use

Land use in the surrounding area consists of rural farm land. The total area of the property is approximately 40 Ha. Based on the site inspection no evidence of land contamination or the potential for land contamination was observed on the site or adjacent to the property boundaries.

3.3 Land Form, Slope and Topography

The site consists of a hill top with gently sloping land to either side. Land slopes vary across the property however maximum slopes are generally less than 5 %.

3.4 Vegetation

The central portion of the property including the airstrip is clear of trees and is covered with mown grass.

3.5 Exposure

The site is well exposed to sun and wind.

3.6 Flood Potential

The site is situated at an elevation of approximately 100 m is well drained and is not expected to be flood prone.

3.7 Erosion Potential

Soil erosion potential for the site based on the soil type is expected to be moderate for disturbed lands or slopes over 10 %. Similar soils on nearby properties for which soil properties have been evaluated show moderate erosion potential on un-vegetated slopes over 10%. Erosion problems are not anticipated for the area of the established airstrip.

3.8 Site Drainage

There were no specific problems with site drainage observed.

3.9 Fill

There are no areas of fill and the proposed EMA is not anticipated to be filled.

3.10 Setback Distances

Horizontal and vertical set back distances listed in **Table 1** have been derived based on a constraint analysis in accordance with AS 1547 tables R1 & R2. In this case the effluent disposal methods include subsurface irrigation and surface spray irrigation. The constraint analysis is based on the use of an AWTS which treats effluent to a secondary standard with disinfection.

AS1547-2012 indicates that where a high constraint value is determined for any site system feature that the maximum setback distance is recommended.

Table 1 – Setback Constraint Analysis		
Constraint	**Off Set**	
	Secondary Treatment & Subsurface Irrigation Disposal	**Secondary Treatment & Surface Spray Irrigation Disposal**
Property Boundary	1.5 m	6 m
Buildings	2.0 m	6 m
Surface water	100 m	100 m
Bore well	NA	NA
Recreational areas	3 m	15 m
In ground water tanks	NA	NA
Retaining walls	NA	NA
Groundwater	NA	NA
Hardpan or bedrock	1.5 m	1.5 m

Table 1 lists set back distances from the EMA to various features of the property or proposed development. The EMA are well set back from the property boundary and proposed buildings. There are no water bores located on the property nor are there any existing or proposed in ground water tanks or retaining walls.

The nearest intermittent water ways are tributaries of Wolumla Creek to the west and Frogshollow Creek located to the east. Both intermittent water ways are located over 100 m from the proposed EMA.

The above setback constraint analysis may need to be re-evaluated if a groundwater bore is installed on the property at a later date.

3.11 Geology

The geology of the area with reference to the 1:25,0000 Bega Mallacoota Geological Map is as follows:

The soils in the immediate area of the site are comprised of soils derived from granodiorite in the Kameruka suite. The site inspection has revealed reddish brown sandy clay topsoils which are commonly referred to as decomposed granite.

3.12 Depth to Hardpan or Bedrock and Depth of Soil

Rock outcrops were not observed on the property.

3.13 Depth to Episodic Seasonal Water Table

Groundwater or a high water table is not evident on the site. It is not expected that a permanent sub-surface water table would be within 3.0 metres of the surface within the EMA.

3.14 Development Restrictions

There are no development restrictions for the site.

4.0 SOIL ASSESSMENT

The site soil assessment is based on a visual inspection of surface soils at the site. Site soils were observed to be sandy clays. Photographs of the proposed effluent management area and surface soils are included in **Appendix B**.

5.0 SYSTEM DESIGN

5.1 Design Irrigation Rate (DIR)

Site soils are estimated to be category 4 clay loam.

Design Irrigation Rate for Category 4 soils is **DIR = 3.5 mm/day** (2)

5.2 Water Balance

Sample water balance spreadsheet calculations are presented in **Appendix C.**

The water balance is based on decile 7 monthly rainfall data from the Bega AWS station 069139.

Minimum area required for spray irrigation = 4 ha

The area of the runway within the controlled boundary is approximately 8.3 Ha therefore sufficient area is available within the runway control boundary for surface spray irrigation of effluent.

5.3 Nutrient Loading (Nitrogen and Phosphorus)

A nutrient balance has been determined for both nitrogen and phosphorous. Sample calculations are attached as **Appendix C.**

The proposed OzziKleen SK 25A treats effluent to an advanced secondary standard. Expected effluent nitrogen and phosphorous concentrations are published in the equipment specification which is attached as **Appendix D.**

Critical Nitrogen Loading Rate(1) = 25mg/m^2/day.

Nitrogen Concentration = 10 mg/L.

Area Required for Nitrogen Uptake = **1.9 Ha**

Critical Phosphorus Loading Rate(1) = 3.0 mg/m^2/day.

Phosphorous Concentration = 5 mg/L.

Area Required for Phosphorous Uptake =**2.1 Ha**

5.4 Treated Effluent Disposal

AS 1547 specifies the following general requirements for spray irrigation systems.

The irrigation system shall;

- Distribute the effluent evenly in the designated area;
- Control the droplet size, throw and plume height of the sprinkler system so that the risk of aerosol dispersion and likelihood of wind drift distributing any effluent beyond the designated area are negligible;
- Have warnings at the boundaries of the designated area in at least to places, clearly visible to property users, with wording such as 'Recycled Water- Avoid Contact - DO NOT DRINK';
- Meet the applicable disinfection criteria; and
- Be provided with a buffer area to ensure that any potential spray drift is absorbed within the appropriate set back distances.

Irrigation systems operate primarily by evapotranspiration and do not rely of absorption or seepage as the primary disposal mechanism.

The proposed effluent distribution system shown in **Figure 4** may consist of fixed or mobile irrigation sprinklers. In order to meet the above recommendations for limiting aerosol dispersion and wind drift a system of mobile sprinklers with relatively short radius throw may need to be considered.

The details shown in this plan comprise a concept plan. It is recommended that an irrigation specialist be retained to size the distribution piping, irrigation pumps and sprinklers.

6.0 GENERAL

6.1 Wet Weather Storage Capacity

Nominal wet weather storage of 3 days at 4860 L per squadron is 14,580 L. It is proposed that wet weather storage be achieved using above ground tank storage with a 15,000 l capacity for each squadron.

6.2 Operation

Use detergents low in or free of phosphorus. Phosphorus is a significant environmental pollutant. Sink waste disposal units may reduce treatment efficiency of the system; consult manufacture for recommendations regarding compatibility with specific treatment systems. Do not install large capacity spa baths (500 litre) as these shock load the system and overload the wastewater EMA. Depending on system performance the EMA soil may be improved by dosing with gypsum at the rate of 0.5kg/m^2 or 1kg/m^2 ploughed into surrounding soil surface from time to time. In the event of system failure the owner is advised to contact Council as a first point of contact.

7.0 REPORT LIMITATIONS

This report is based on field observations and information provided in the development plan. The site has been evaluated using commonly accepted environmental engineering practices and standards. To the best of our knowledge these findings represent conditions at the times and places stated. The report should be read in its entirety. Figures and other attachments should not be separated from the report. The findings of this report should not be used to infer conditions for any other time or location except as specifically addressed in the report. Questions regarding this report, its findings or applicability to conditions not specifically addressed in the report should be directed to TEC. This report is intended to be used by the Client and their assigns. No part of this report may be used by any other party for any purpose without the express written permission of the Client and TEC.

Tasman Engineering Consultants

Austin F. Legler, CP. Eng.

Appendix A- Figures

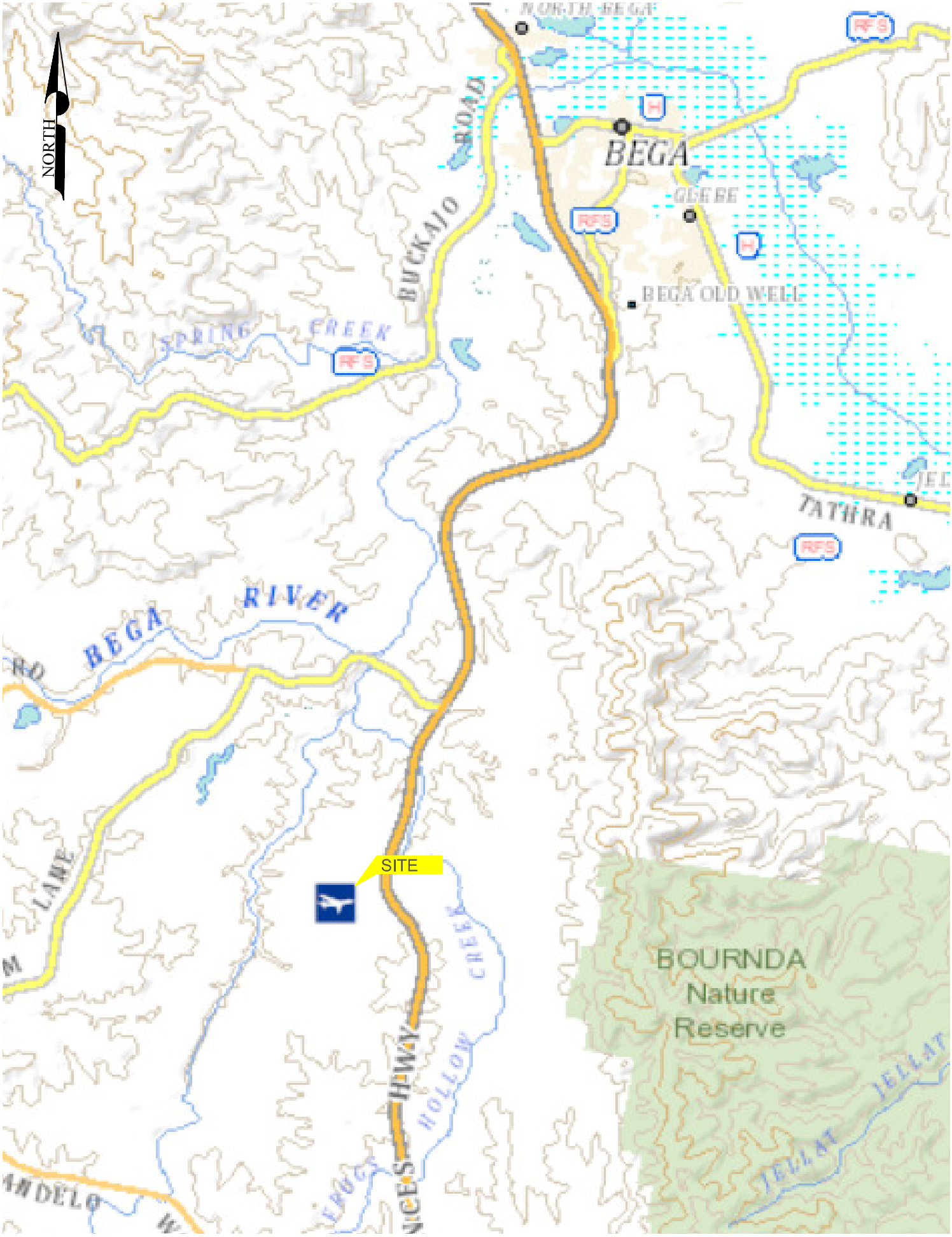

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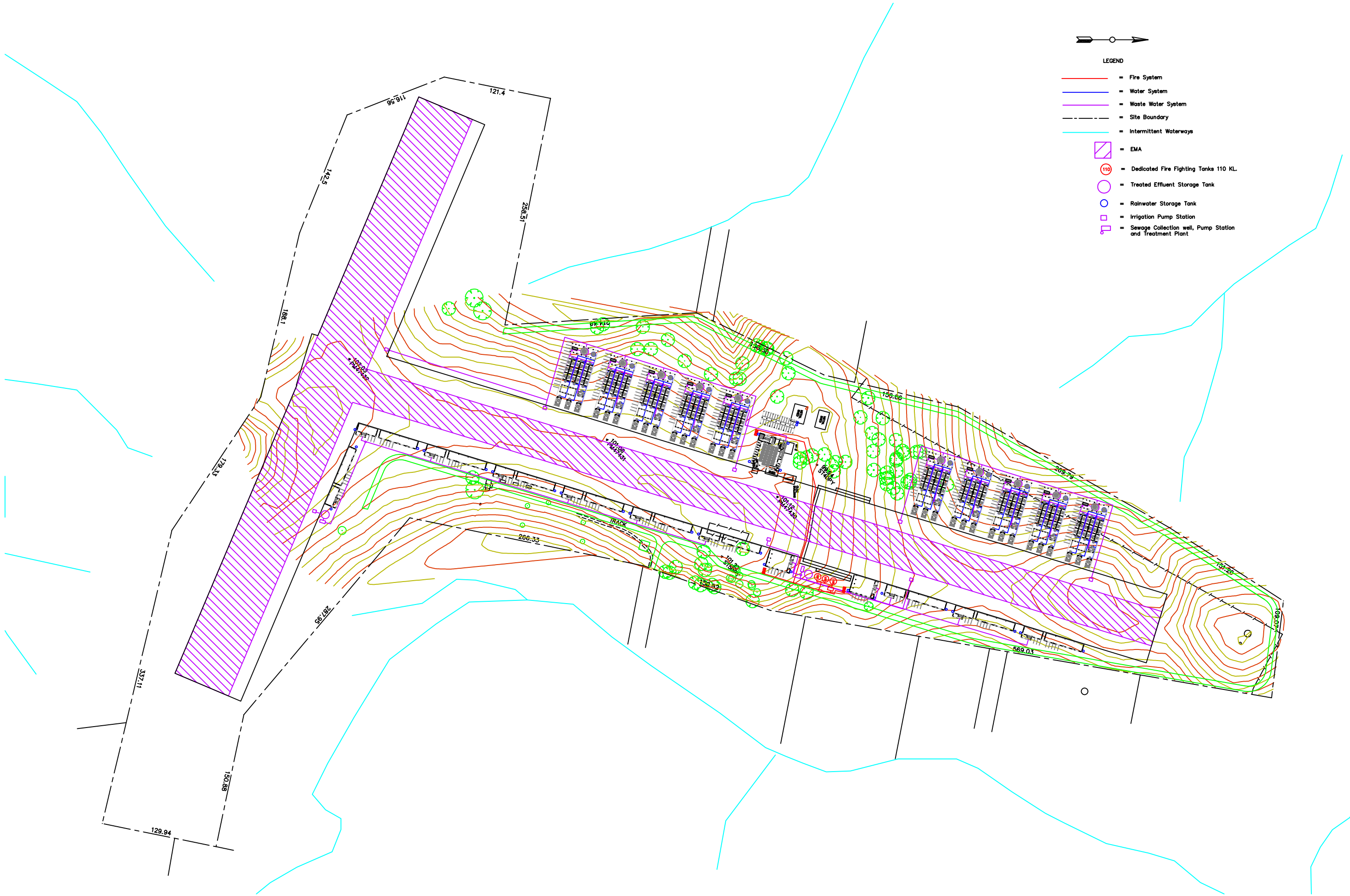
Figure 1- Site Vicinity Map

On Site Sewage Management Assessment
Frogshollow Airstrip

DESIGN:
DRAWN: al
CHECKED:
SCALE: None
DATE: 25-9-17



No.	Revision	Drawn	Approved	Date

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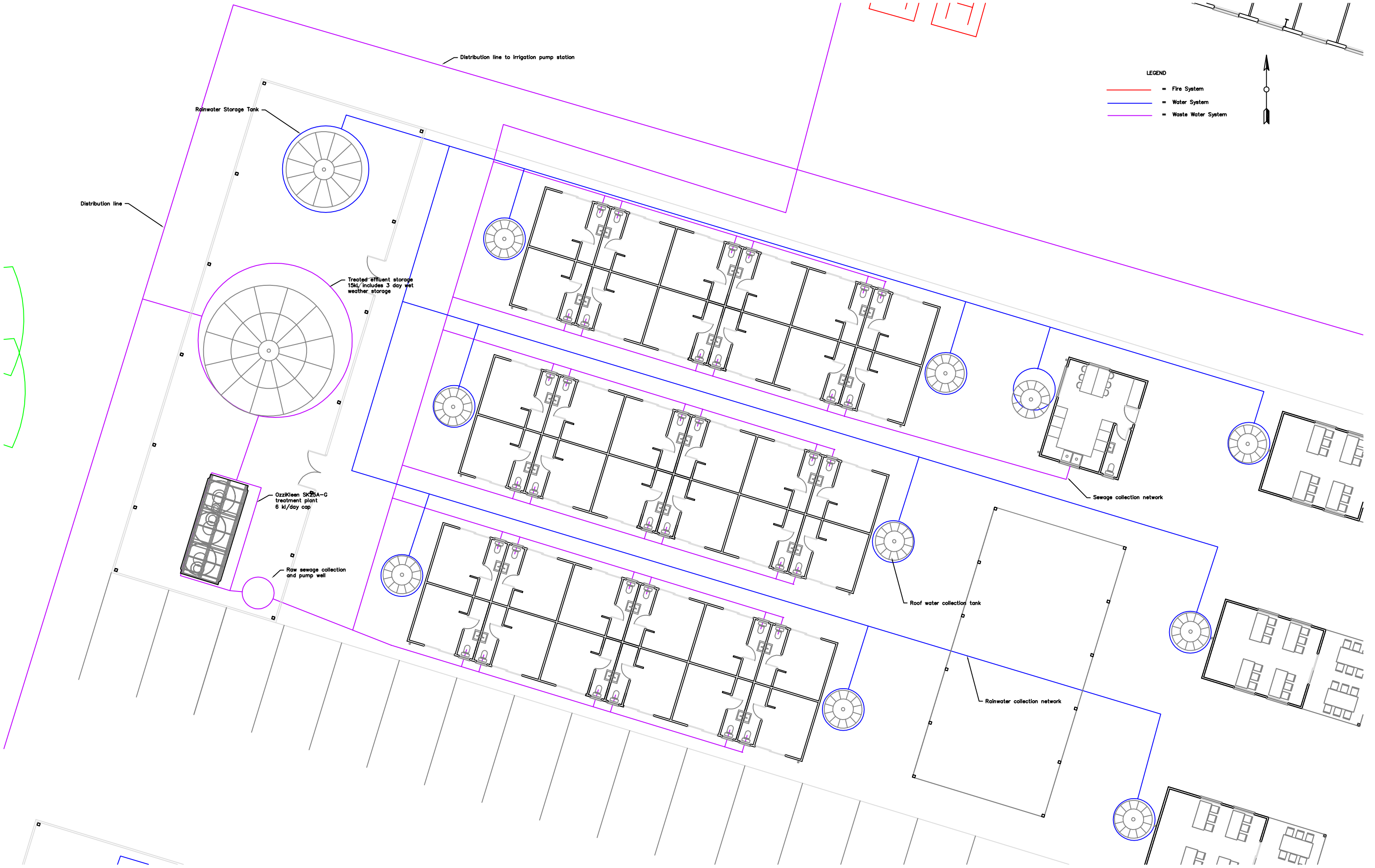
Date 25-10-17
Approved
A.F.Logiter B.S., M.A.S.C.E., M.I.E.(Aust.), C.P.Eng.

Title: Frogs Hollow Flight School
Figure 2- Detailed Site Plan
Client: Recreational Aviation Australia
Size: A1
Drg. No.: S-518
Sheet of
Rev.



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Title: Frogs Hollow Flight School
Figure 3- Treatment System Detail
Client: Sport Aviation Australia
Size: A1
Drg. No.: S-518
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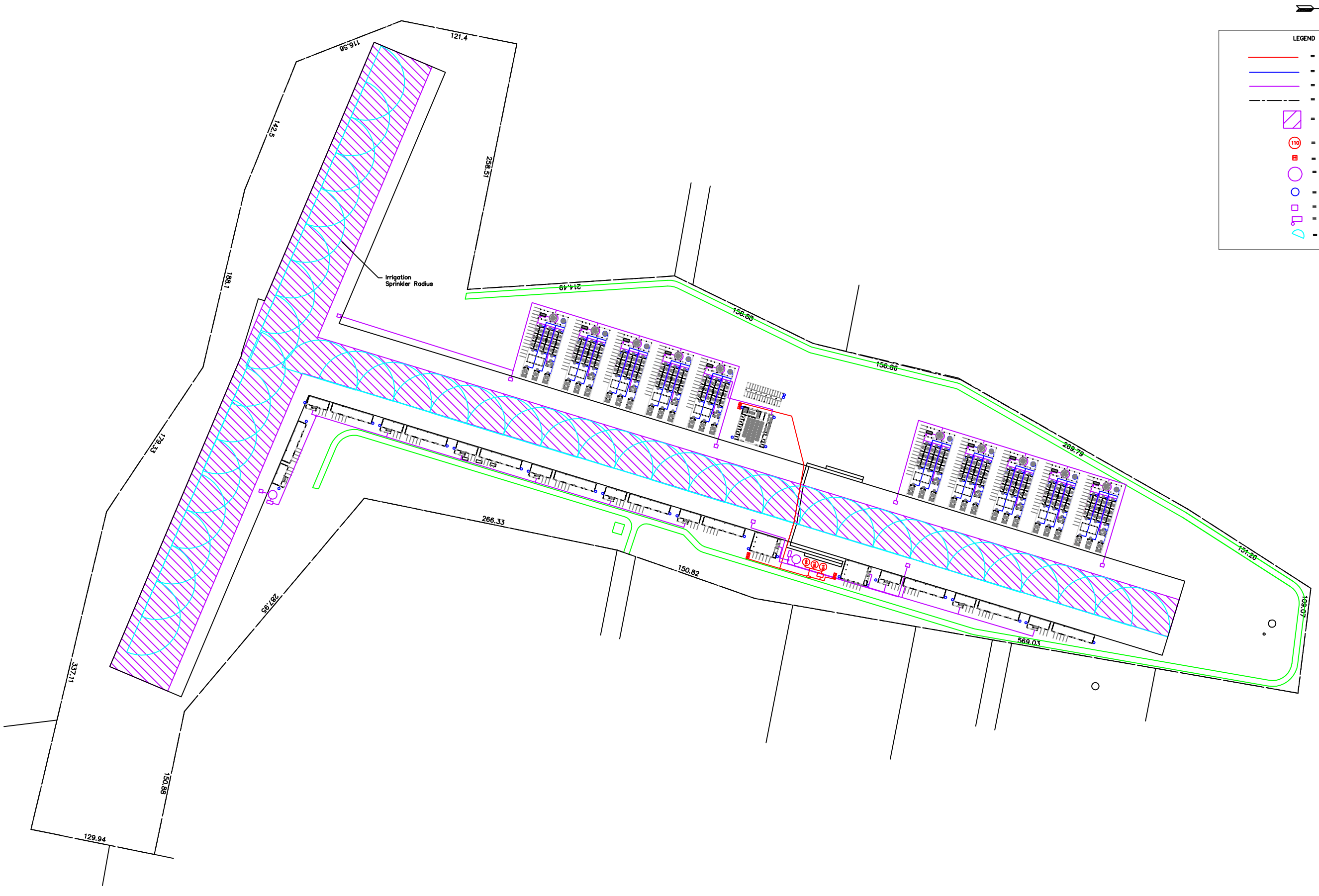
Rev



No.	revision	Drawn	approved	Date

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Title: Frogs Hollow Flight School
Figure 4- Effluent Irrigation Concept
Client: Recreational Aviation Australia
Size A1 Drg. No. S-518 Sheet of rev

Appendix B- Site Photos

Existing Airstrip Looking South

Existing Airstrip Looking North

Typical Decomposed Granite Soils

Appendix C- Water Balance and Nutrient Absorption Sample Calculations

WATER BALANCE CALCULATIONS - Nominated Area Method

Design Wastewater Flow	Q		L/day	49200	Bega AWS Station 069139 Decile 7 Rainfall
Design Percolation Rate	R		mm/day	3.5	Frogshollow Airstrip
Land Area	L		m^2	40000	

Parameter	**Symbol**	**Formula**	**Units**	**Jan.**	**Feb.**	**Mar.**	**Apr.**	**May**	**Jun.**	**Jul.**	**Aug.**	**Sept.**	**Oct.**	**Nov.**	**Dec.**
Days per Month	D	-	days	31	28	31	30	31	30	31	31	30	31	30	31
Precipitation	P	-	mm/month	61.05	108.4	121.6	49.9	61.45	88.7	57.5	55.3	46	66.25	85.35	107.85
Evaporation	E	-	mm/month	187.5	162.5	125.0	80.0	55.0	35.0	45.0	55.0	75.0	112.5	187.5	175.0
Crop Factor	C	-		0.8	0.8	0.8	0.8	0.7	0.6	0.6	0.6	0.7	0.8	0.8	0.8
Inputs															
Precipitation	P	-	mm/month	61.1	108.4	121.6	49.9	61.5	88.7	57.5	55.3	46.0	66.3	85.4	107.9
appied effluent	W	(QxD)/L	mm/month	38.1	34.4	38.1	36.9	38.1	36.9	38.1	38.1	36.9	38.1	36.9	38.1
Inputs		P+W	mm/month	99.2	142.8	159.7	86.8	99.6	125.6	95.6	93.4	82.9	104.4	122.3	146.0
Outputs															
Evapotranspiration	ET	E x C	mm/month	150.0	130.0	100.0	64.0	38.5	21.0	27.0	33.0	52.5	90.0	150.0	140.0
Percolation	B	RxD	mm/month	108.5	98.0	108.5	105.0	108.5	105.0	108.5	108.5	105.0	108.5	105.0	108.5
Outputs		ET+B	mm/month	258.5	228.0	208.5	169.0	147.0	126.0	135.5	141.5	157.5	198.5	255.0	248.5
Storage	S	(P+W)-(ET+B)	mm/month	-159.3	-85.2	-49	-82	-47	0	-40	-48	-75	-94	-133	-103
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**

Notes : No allowance for runoff coefficient in P
No allowance for voids in S

Storage	V	largest M	mm	0
		VxL/1000	m^3	0.0

Nutrient Balance Calculations

Based on DLG 1998 p 153 revised August 14, 2009

$Q := 49200 \cdot \frac{L}{day}$ Wastewater flow rate (litre/day)

$Pcap := 3600 \cdot \frac{kg}{hectare}$ Phosphorus absorption capacity (from soil test results)

Nitrogen

$Cn := 10 \cdot \frac{mg}{L}$ Average nitrogen concentration of treated sewage (mg/l) (ESC 2009 p 8, DLG 1998 p 86)

$Lx := 25 \cdot \frac{mg}{m^2 \cdot day}$ Critical nitrogen loading rate (mg/m^2/day) (ESC 2009 p 8, DLG 1998 p 153)

$An := Cn \cdot \frac{Q}{Lx}$

$An = 19680\,m^2$ Land area required for nitrogen absorption.

Phosphorus

Phosphorous absorbed

$Lp := 3.0 \cdot \frac{mg}{m^2 \cdot day}$ Critical phosphorus loading rate (mg/m^2/day) (ESC 2009 p 8) DLG1998 p 154 uses 3.0 mg/m^2/day

$Pab := \frac{Pcap}{3}$ DLG 1998 p 153 Phosphorus sorption by soil up to 1/4 to 1/2 of Pcap. Use 1/3 as an average.(DLG 1998 p 153)

$Pab = 0.12 \cdot \frac{kg}{m^2}$

$Tp := 5 \cdot \frac{mg}{l}$ Total phosphorus concentration of in treated wastewater (ESC 2009 p 8, DLG 1998 p 86)

Phosphorus absorbed in 50 years

$$Puptake := Lp \cdot (365 \cdot 50) \cdot day$$

$$Puptake = 0.055 \cdot \frac{kg}{m^2}$$

Phosphorus generated over 50 years

$$Pgen := Tp \cdot Q \cdot (365 \cdot 50) \cdot day$$

$$Pgen = 4489.5 \cdot kg$$

$$Ap := \frac{Pgen}{(Pab + Puptake)}$$ Land area for phosphorus absorption (m^2)

$$Ap = 2.569 \times 10^4\, m^2$$

Reference

1) Environment & Health Protection Guidelines," Onsite Sewage Management for Single Households" Department of Local Government, February 1998.

2) Eurobodalla Shire Council On-site sewage management Code of Practice 2009

Report

$$Ap = 25690.99\, m^2$$ Land Irrigation area for phosphorus absorption (m^2)

$$An = 19680 \cdot m^2$$ Land irrigation area required for nitrogen absorption (m^2).

Appendix D- Treatment Equipment Specification

SPECIFICATION

for

OZZI KLEEN SEWAGE TREATMENT PLANT

Models: SK25A & SK25A-G

OzziKleen
Waste Water Systems

Head Office: 59 Industrial Ave, Kunda Park, QLD 4556

Neatport Pty Ltd trading as Suncoast Waste Water Management

Phone: +61 7 5459 4900

Fax: +61 7 5456 4677

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GENERAL

Suncoast Waste Water Management has developed Ozzi Kleen a unique sewage treatment system. In this compact system, flow equalisation, biological oxidation, secondary sedimentation and biological nutrient removal occur in an aerobic treatment process.

RAW SEWAGE CHARACTERISTICS

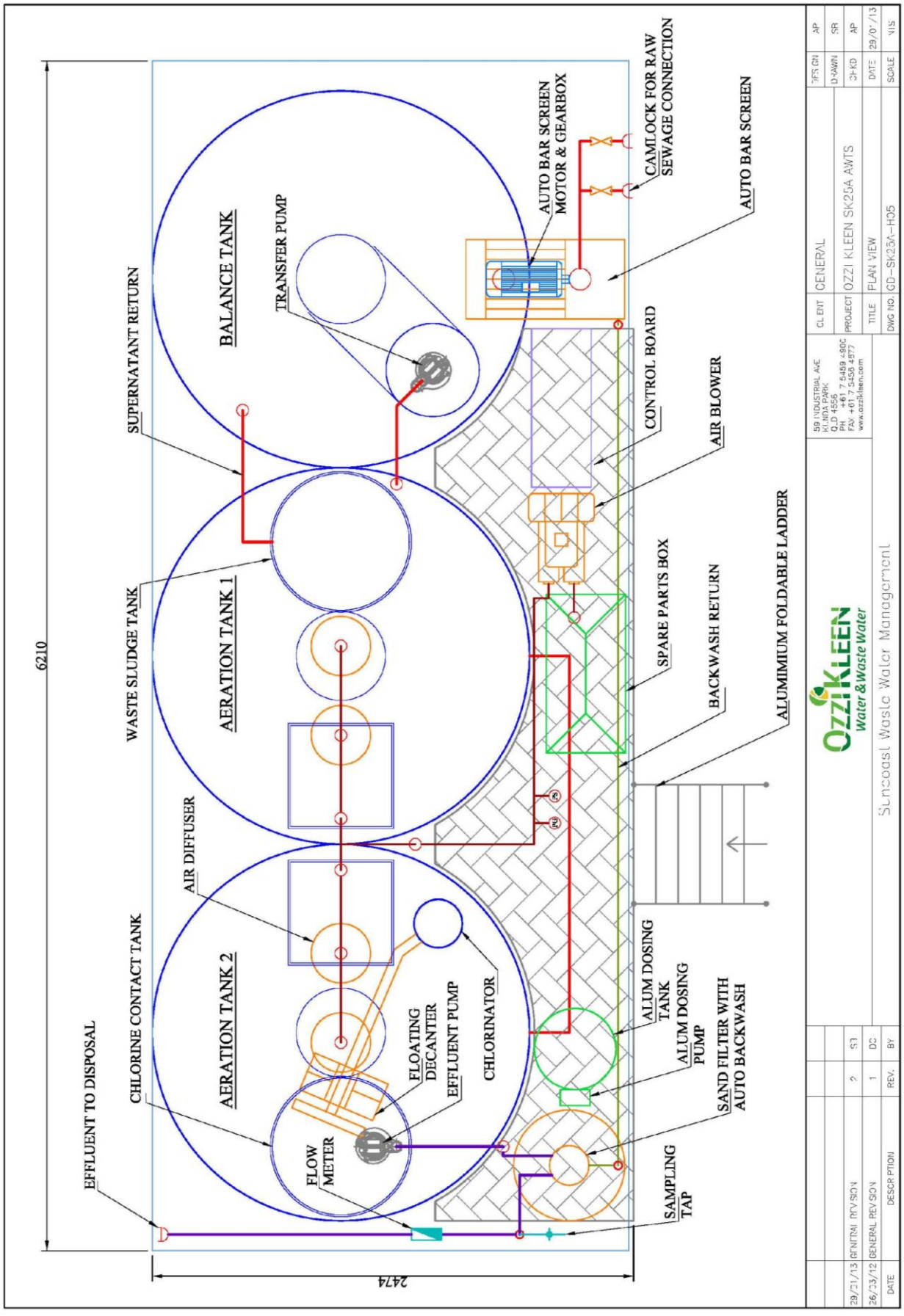
The plant performance is based on the following incoming raw sewage characteristics:

PARAMETER	RAW WASTEWATER CHARACTERISTICS
Wastewater treatment capacity	30 Equivalent Persons at 200 l/person/day
Maximum hydraulic load	6,000 l/day
Biological Oxygen Demand (BOD_5)	350 mg/litre or 70 g/day/person
Total Suspended Solids (TSS)	350 mg/litre or 70 g/day/person
Total Nitrogen	75 mg/litre or 15 g/day/person
Total Phosphorus	12.5 mg/litre or 2.5 g/day/person
Fats, Oils & Grease (FOG)*	75 mg/litre
pH	6 < pH < 10
Wastewater temperature range	10°C to 38°C

* *For restaurant applications, a grease trap must be fitted upstream of the treatment plant to remove grease and oils (SK25A model only).*

SYSTEM OVERVIEW

The SK25 series of sewage treatment plants consist of a 5,000 L balance tank, an automatic bar screen, nutrient removal equipment and two Ozzi Kleen bioreactors mounted on a steel skid (refer to diagram on Page 4). This also includes a grease trap on the SK25A-G model.


6210
2274
EFFLUENT TO DISPOSAL
CHLORINE CONTACT TANK
AERATION TANK 2
AIR DIFFUSER
WASTE SLUDGE TANK
AERATION TANK 1
SUPERNATANT RETURN
BALANCE TANK
TRANSFER PUMP
FLOW METER
FLOATING DECANTER
EFFLUENT PUMP
CHLORINATOR
SAMPLING TAP
ALUM DOSING TANK
ALUM DOSING PUMP
SAND FILTER WITH AUTO BACKWASH
SPARE PARTS BOX
BACKWASH RETURN
ALUMIMIUM FOLDABLE LADDER
CONTROL BOARD
AIR BLOWER
AUTO BAR SCREEN MOTOR & GEARBOX
CAMLOCK FOR RAW SEWAGE CONNECTION
AUTO BAR SCREEN
OZZI KLEEN
Water & Waste Water
Suncoast Waste Water Management
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KUNDA PARK
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PH: +61 7 5459 4800
FAX: +61 7 5458 4877
www.ozzikleen.com
CLIENT GENERAL
PROJECT OZZI KLEEN SK25A AWTS
TITLE PLAN VIEW
DWG NO. GD-SK25A-H05
DESIGN AP
DRAWN SR
CHKD AP
DATE 29/01/13
SCALE NTS
29/01/13 GENERAL REVISION 2 SR
26/03/12 GENERAL REVISION 1 DC
DATE DESCRIPTION REV. BY

TREATED EFFLUENT QUALITY

The treated effluent produced by SK25 sewage treatment plants is designed to be within the required guidelines for advanced secondary effluent quality. The standard advanced secondary effluent quality guidelines are as follows:

PARAMETER	UNIT	ADVANCED SECONDARY EFFLUENT QUALITY
Ozzi Kleen Model		SK25A & SK25A-G
Biological Oxygen Demand (BOD_5)	mg/L	≤ 10
Total Suspended Solids (TSS)	mg/L	≤ 10
Total Nitrogen (TN)	mg/L	≤ 10
Total Phosphorus (TP)	mg/L	≤ 5
Turbidity	NTU	≤ 2
pH		6.5 - 8.5
Faecal Coliforms, FC	cfu per 100 mL	≤ 10
Chlorine Residual	mg/L	0.5 – 2.0

* The treatment plant is to be serviced at the regular interval of every three months, which will require a full service as set out in the Owner's Manual.

SK25 SEWAGE TREATMENT PLANT SPECIFICATIONS

SK25 System Specifications Table

Description	Make & Model	Service	No.	Rated Power or Size	Full Load Current
Bar Screen					
Automatic Bar Screen	Ozzi Kleen	Duty	1	---	---
Balance Tank					
Tank	Ozzi Kleen PT4000 Poly	Duty	1	∅1900 x 2800 H	---
Transfer Pump	Showfou STA-112NS	Duty	1	0.75 kW 240 VAC	1.5 A
Bioreactor					
Tank	Ozzi Kleen PT4000 Poly	Duty	2	∅1900 x 2800 H	---
Air Blower	Ozzi Kleen 4RB410	Duty	1	1.1 kW 240 VAC	1.0 A
Air Diffuser	GVA Elastox-T Type B	Duty	4	300 mm	---
Floating Decanter	Ozzi Kleen FD50	Duty	1	Poly Ø 50 mm	---
Float Switch (SBR)	Multitrode	Duty	3	---	---
Effluent Tank & Chlorinator					
Effluent Tank	Ozzi Kleen PT850 Poly	Duty	1	800 L	---
Chlorinator	Ozzi Kleen 120	Duty	1	1 Canister	---
Basket Strainer	Ozzi Kleen OK150	Duty	1	2000 µm mesh size	---
Effluent Pump	Reefe RHV180	Duty	1	400 W 240 VAC	4.0 A
Backwash Pump	Reefe RHV220	Duty	1	700 W 240 VAC	6.0 A
Waste Sludge Tank					
Sludge Tank	Ozzi Kleen PT850 Poly	Duty	2	800 L	---
Sand Filter					
Sand Filter with Automatic Backwash	Ozzi Kleen	Duty	1	∅600 x 900 H	---
Backwash Valves	Ozzi Kleen OM-A	Duty	2	10W	0.4 A

DESCRIPTION	MAKE & MODEL	SERVICE	NO.	RATED POWER OR SIZE	FULL LOAD CURRENT
Controls and Miscellaneous					
Control Panel	OK Control Panel with Mitsubishi PLC	Duty	1	---	---
Solenoid & Dump Valve Assembly	Ozzi Kleen	Duty	4	240 VAC	---
Aluminum Access Ladder	Ozzi Kleen 1500	Duty	1	750 x 600 x 1800	---
Aluminum Platform & Handrails	Ozzi Kleen 1900	Duty	1	4800 x 600 x 1800	---
Chlorine Tablets	Trichloroisocyanuric Acid Tablets	---	---	By client	---
Flow meter	HR Products MT-EX32	Duty	1	32mm	---
Phosphate Removal Equipment					
Chemical Dosing Pump	Iwaki B16 Pump	Duty	1	240 VAC	0.5 A
Chemical Dosing Tank	Ozzi Kleen 150	Duty	1	∅500 x 900 H	---
Chemical Dosing Agent	Alum (Aluminium Sulphate)	---	---	By client	---
Grease Trap *(SK25A-G only)*					
Grease Trap Tank	Ozzi Kleen GT500R Poly	Duty	1	500L	---
Lifting Pump	Reefe RVS300	Duty	1	400 W 240 VAC	4.0 A

Method of Construction and Materials

The tanks are a one-piece vessel made of polyethylene, using the roto-moulding process. As the tanks are roto-moulded in one operation, there are no seams or joins.

The minor components of the plant are also made of roto-moulded polyethylene. These components are screwed in place to achieve a robust and corrosion proof system.

Polyethylene Specifications Table

The polyethylene used to roto-mould Ozzi Kleen tanks and components is as follows:

Description	Specification
Conforms to food grade requirement	FDA Regulations CFR21 Part 117.1520
Density to ASTM D1505	939 kg/m^3
Tensile Strength at Yield @ 500 mm/min to ASTM D638M	18 MPa
Flexural (Young's) Modulus to ASTM D790M	760 MPa
Vicat Softening Temperature to ASTM D1525	117°C

Septic Tanks & Collection Wells

Manufactured by

Aussie Precast Products

11229 Princes Highway,
Cobargo N.S.W. 2550
Ph 02 64938327
Australian Standards Lic No. SMK1473

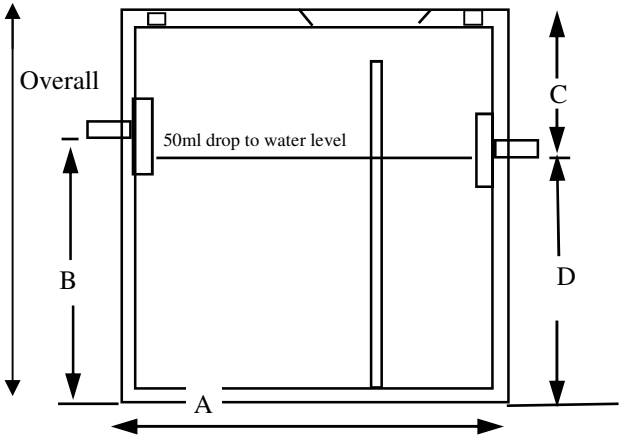
Capacity in Litres	A	B	C	D		overall height
3050	1800	1620	360	1570		1930
3500	1930	1595	410	1540		1950
4600	1930	1910	420	1880		2300
* 3550	3200	620	360	570		930

Sizes & Capacities of Septic Tank

Capacity in Litres	A	B	C		Overall height
3150	1800	1570	360		1930
3750	1930	1540	410		1945
4750	1930	1880	420		2300
5550	1930	2160	425		2585
* 3600	3200	620	360		930

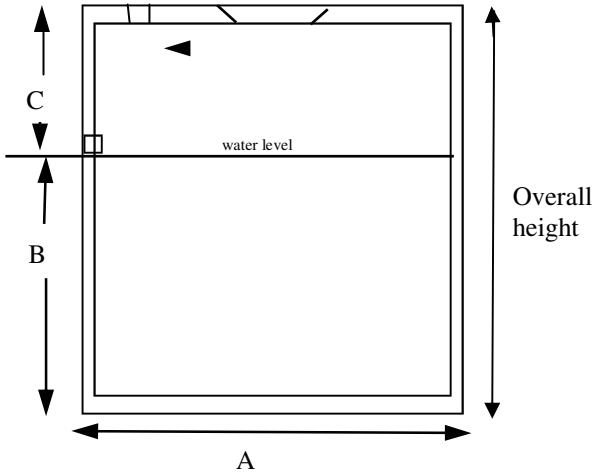
Sizes & Capacities of Collection Wells

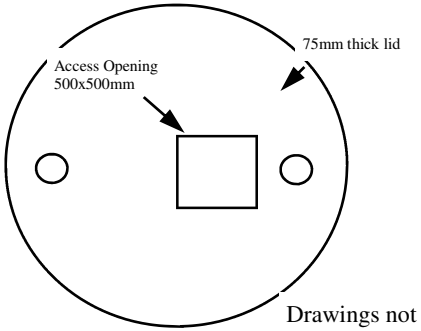
* These squat septic/collection tanks are specifically designed for shallow sites where depth is limited.



SPECIFICATIONS

1. Baffle wall only in Septic Tanks
2. Concrete 40 m.p.a. comp. strength at 28 days reinforced with 126mm/sq mtr Steel Fibre to comply with AS/NZS 1546.1:1998
3. Baffle wall to have min. 150mm diam opening midway up from base to water level.
4. Inspection covers 150mm diameter
5. Floor & Lid thickness 65mm minimum.
6. Wall thickness 60mm minimum.





Drawings not to scale

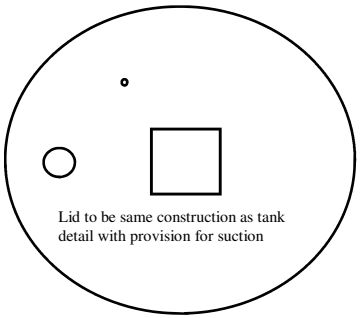
Name.....

Lot .....DP.....

Street.....

Locality.....

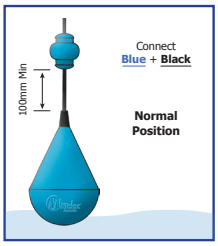
Shire.....



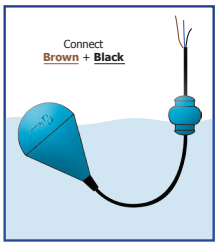
Updated 26/03/2008

9010 FLOAT SWITCH

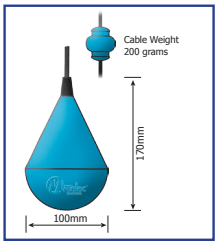
• Liquid Temperature	Min 0˚C (32˚F) Max 60˚C (140˚F)
• Liquid Density	Min .65g/cm Max 1.5g/cm
• Protection	IP68 @ 20m (65ft)
• Working Pressure	.35MPa
• Switching Speed	600/min
• Contact Life	10 million switches
• Contact Type	Microswitch with NO and NC contacts
• Switching Angle	20˚ (from horizontal)
• Max Voltage	240Vac
• Max Current	10amp (COS 0)
• Cable Material	Neoprene Rubber
• Cable Size	ø7mm / 3 x .75mm²
• Housing Material	ABS - Acrylonine Butadiene Styrene
• Chemical Resistance	Acid - Good Alkaline - Good Petro - Good



Close on Fall - (Normally Closed)



Close on Rise



Dimensions

Code	Description	Qty
FSW-12517	9010 NRB 10m Cable	1
FSW-12518	9010 NRB 15m Cable	1
FSW-12519	9010 NRB 20m Cable	1
FSW-12520	9010 NRB 30m Cable	1
FSW-12521	9010 NRB 40m Cable	1

SUBMERSIBLE JX-400S

E□luent and waste water □um□

APPLICATION

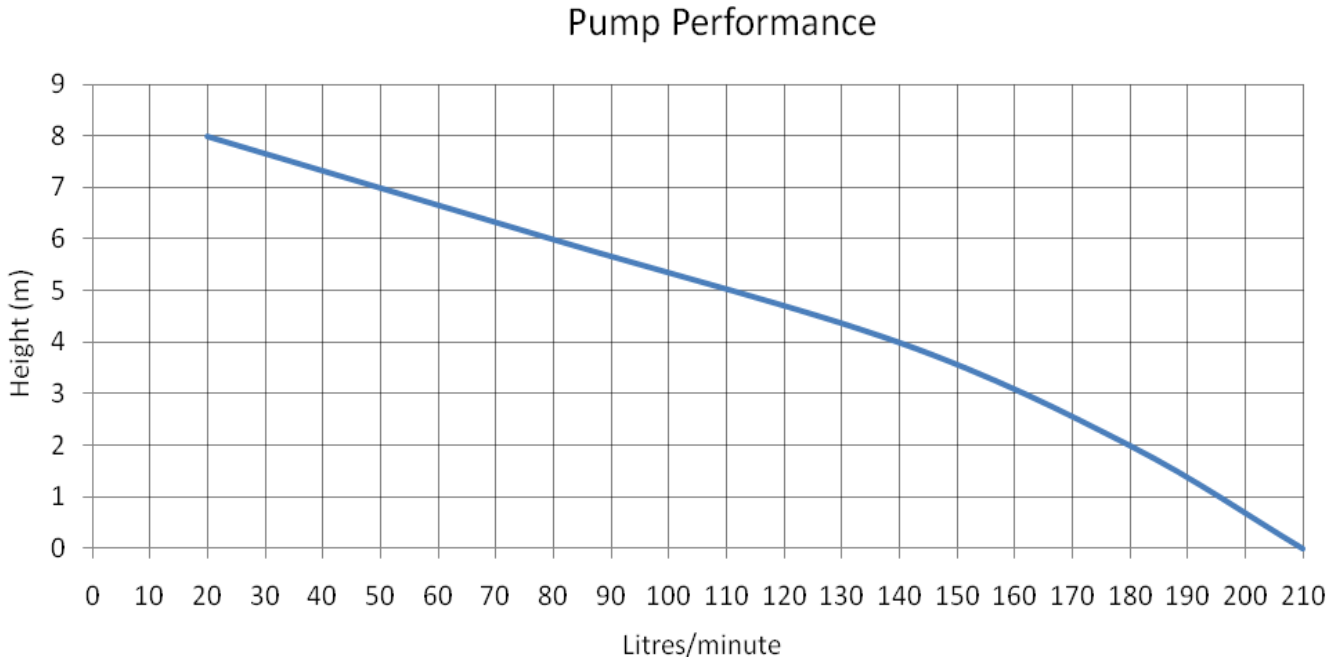
Suitable □or carr□ing waste water and e□luent the □□-400S is based on the vorte□ □rinci□le, has a genuine non-clog im□eller design.
NOT SUITABLE FOR HUMAN WASTE ONL□ DAIR□ AND SHEEP EFFLUENT

DESIGN FEATURES

- Built-in overload □rotection
- Stainless steel heat treated sha□t with double seals in oil chamber
- Corrosion resistant cover and □um□ housing
- Stainless steel motor housing suction cover and screws
- Potted leads sealed with e□o□□ resin
- Full□automatic level control

TECHNICAL DATA

Part Number	□□-400S	Weight □□g□	18
Motor □□W □HP□	0.45 □0.6	Outlet □mm□	50
Power □Volts □□hase□	230 - 240 □1	Full Load Current □A□	3 am□s
Pum□ Dimensions □mm□	500□H□□225□W□	Min Sum□ Dimension	700□700□700mm



Appendix E- References

References

1. Environmental & Health Protection Guidelines, “On-site Sewage Management for Single Households”, Department of Local Government (DLG), February 1998.

2. On-site domestic-wastewater management, AS1547:2012, Standards Australia.

3. Designing and Installing On-Site Wastewater Systems, Sydney Water Catchment Authority 2012.

4. Bega Mallacoota 1:250,000 Geological Series Sheet SJ/55-4, Geological Survey of New South Wales, Second Edition 1995.

5. Wolumla 1:25,000 Topographic Map (8824-2N), Land & Property Information New South Wales.

6. Neutral or Beneficial Effect on Water Quality Assessment Guideline (NORBE). Sydney Catchment Authority 2011.