

## **EA APPLICATION SUPPORTING REPORT**

**SAVANNAH GOLDFIELDS LTD**

**Appendix 3 Wastewater and Effluent Disposal System (Taylor Enviro, 2020)**



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# **Site and Soil Evaluation**

## **On-Site Wastewater and Effluent Disposal System Design Solution**

**Agate Creek Camp  
2 Rungalla Road, Forsyth QLD 4871**

**Taylor Environmental No: TE201127**

**Date: 23 April 2020**

## Document Control Table

**Taylor Environmental Project Number: TE201127**

**Site and Soil Evaluation**

**On-Site Wastewater Treatment and Effluent Disposal System  
Design Solution**

**Agate Creek Camp  
2 Rungalla Road, Forsyth QLD 4871**

| Revision | Date          | Revision Details | Author    | Approver                                                                                                            |
|----------|---------------|------------------|-----------|---------------------------------------------------------------------------------------------------------------------|
| A        | 21 April 2020 | Issue A          | M. Mahony | Chris Taylor                                                                                                        |
| B        | 23 April 2020 | Issue b          | M. Mahony | <br>Chris Taylor<br>0400 301 364 |
|          |               |                  |           |                                                                                                                     |

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## 1. Background

Taylor Environmental (Australia) Pty Ltd was engaged by Laneway Resources to design an on-site wastewater treatment and effluent disposal system at Agate Creek Camp, 2 Rungalla Road, Forsayth QLD 4871 within Mining Lease ML100030. This site is not serviced by a municipal sewer network and is serviced by an existing on-site wastewater treatment and effluent disposal system. This system is to be replaced with the following design.

The location of the site is presented in Figure 1, below.

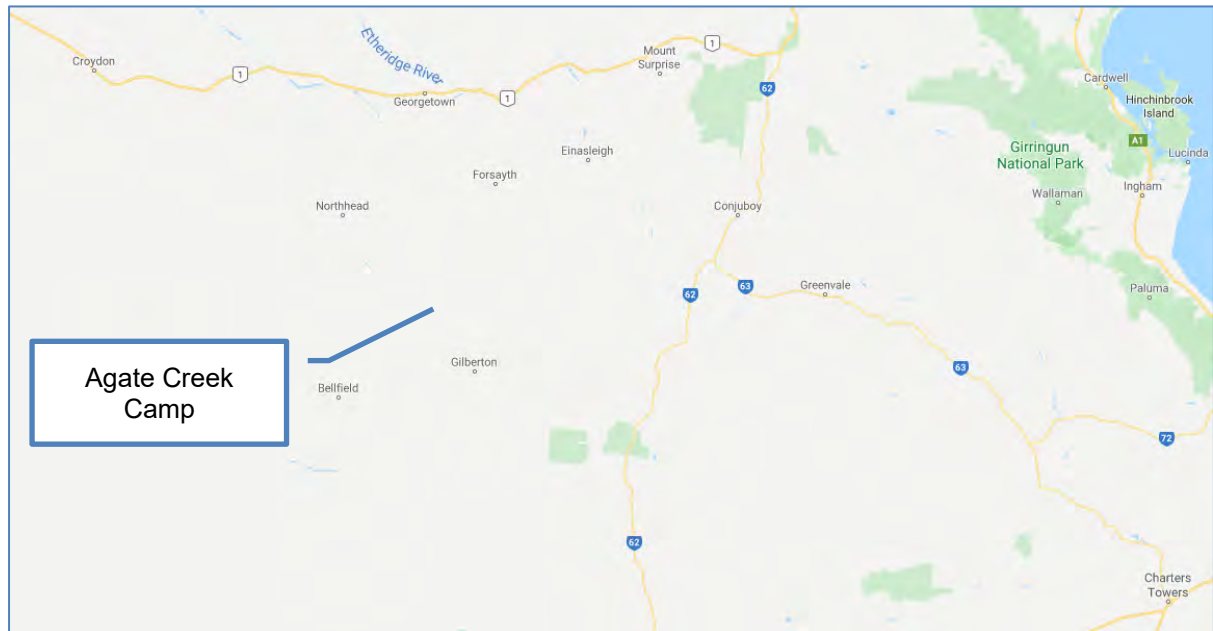


Figure 1: Locality Map

The mining camp at this site is to be serviced by 2 x new Earthsafe D10 S/F treatment plants with a land application area of fixed sprinklers. The existing treatment system is to be decommissioned and abandoned.

The design was completed by Chris Taylor (Director, Taylor Environmental (Australia) Pty Ltd, QBCC Licence Number 150 556 72).

## 2. Legislation and Standards

This report has been completed in accordance with the relevant legislative requirements:

- Plumbing and Drainage Act
- Plumbing and Drainage Regulation
- Queensland Plumbing and Wastewater Code
- AS/NZS 1547:2012 On-site domestic wastewater management
- Plumbing Code of Australia (PCA)
- Queensland Standard Plumbing and Drainage Regulation

### 3. Effluent Standards

Table 1 below presents the effluent standards produced by Chief Executive Officer approved wastewater treatment systems with irrigation. The OSSF to service the site is an Earthsafe D10 S/F (Chief Executive Officer Approval #05/2019).

**Table 1: Chief Executive Officer Approved System Effluent Quality**

| Parameter                 | Secondary                                                                                                                                                                                                                                                                                    | Advanced Secondary                                                                                                                                                                                                                                                                         |
|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Biochemical Oxygen Demand | 90% < 20 mg/L<br>100% < 30 mg/L                                                                                                                                                                                                                                                              | 90% < 10 mg/L<br>100% < 20 mg/L                                                                                                                                                                                                                                                            |
| Total Suspended Solids    | 90% < 30 mg/L<br>100% < 45 mg/L                                                                                                                                                                                                                                                              | 90% < 10 mg/L<br>100% < 20 mg/L                                                                                                                                                                                                                                                            |
| Disinfection              | Where disinfection is provided, 90% of the samples taken over the test period shall have thermotolerant coliform count (determined by either the most probable number of membrane filter technique) not exceeding 200 organisms per 100ml with no sample exceeding 1000 organisms per 100ml. | Where disinfection is provided, 90% of the samples taken over the test period shall have thermotolerant coliform count (determined by either the most probable number of membrane filter technique) not exceeding 10 organisms per 100ml with no sample exceeding 200 organisms per 100ml. |
| Chlorination              | Where chlorination is the disinfection process, the total chlorine concentration shall be greater than or equal to 0.5g.m <sup>3</sup> and less than 2.0g/m <sup>3</sup> in 4 out of 5 samples taken.                                                                                        | Where chlorination is the disinfection process, the total chlorine concentration shall be greater than or equal to 0.5g/m <sup>3</sup> and less than 2.0g/m <sup>3</sup> in 4 out of 5 samples taken.                                                                                      |

### 4. Site and Soil Evaluation

The property description details of this site are:

Mining Lease - ML100030  
Lot and Plan Number - Lot 2 on SP242983  
Local Authority - Etheridge Shire Council

The soil is a well-draining category 2 decomposed granite to a depth of 1000mm with an indicative permeability ( $K_{sat}$ ) of 1.4 – 3.0 m/day. The Design Irrigation Rate (DIR) is 5 mm / day. Soil samples are presented in Figure 2, below.



**Figure 2: Soil Samples**

An aerial photograph of the site is presented in Figure 3, below.



Figure 3: Aerial Photograph of Site

## 5. Wastewater System Solution Design

The site can accommodate up to 23 people. This design is based on 23 people using 120L/person/day for a total design volume of 2760 L/day.

Section 2 of the Environmental Protection Regulation 2008 stipulates that a site triggers an ERA63(1)(a)(i) regulation when the Regulated Activity has an Equivalent Persons greater than 21EP. The EP for this design is determined below.

$$EP = \frac{V}{200} = \frac{2760}{200} = 13.8EP$$

**The Equivalent Persons for Regulated sewage treatment works on this site is 13.8EP, and therefore is required to be not regulated by an ERA.**

Table 2 below presents the key features of this design solution.

Table 2: Design Features

| Feature           | Solution                                |
|-------------------|-----------------------------------------|
| Treatment system  | 2 x Earthsafe D10 S/F (CEA #05/2019)    |
| Treatment level   | Advanced secondary                      |
| Hydraulic Loading | 23 people @ 120L/person/day = 2760L/day |
| Required LAA      | $A = Q / DLR = 2760/5 = 552m^2$         |
| Actual LAA        | $A = 576.0m^2$                          |

## Comments and Recommendations

- Install a new 1,000L (min) grease interceptor trap at the kitchen. Undertake regular maintenance as described in Appendix A SL3
- Abandon the existing macerator pump
- All sanitary drainage to drain to existing 2,500L septic tank
- New submersible pump to transfer wastewater to 2 x new Earthsafe D10 S/F treatment plants for advanced secondary treatment
- The flow to each treatment plant is to be evenly distributed via flow control valves
- Effluent to be transferred to the fixed sprinkler (wobblers) land application area
- Each Earthsafe will service 50% of the land application area
- Indexing valves are to be installed on both rising mains to the land application area to direct effluent flow to each row in sequence
- Flow control valves on each sprinkler to ensure even distribution
- Sprinkler spray not to exceed 2000 radius

The system design drawings are presented in [Appendix A](#).

The geotechnical borelog is presented in [Appendix B](#).

## 6. Setback Distances

The Queensland Plumbing and Wastewater Code setback tables that relate to the setback distances are Table T3 and Table T5, presented below.

**Table T3 –Setback distances for surface irrigated land application area for a greywater treatment plant or an on-site sewage treatment plant**

| Feature                                            | Horizontal separation distance ① |
|----------------------------------------------------|----------------------------------|
| Property boundaries, pedestrian paths and walkways | 2                                |
| Water edge of a swimming pool                      | 6                                |
| Dwellings, recreation areas                        | 10                               |

① Distances are given in metres and are measured from the edge of the irrigated wetted area to any point of the feature.

**Table T5 - Setback distances for on-site sewerage facilities and greywater use facilities - Protection of surface water and groundwater.**

| Feature                                                                                       | Separation distance ① |           |           |
|-----------------------------------------------------------------------------------------------|-----------------------|-----------|-----------|
|                                                                                               | Advanced Secondary    | Secondary | Primary②  |
| For onsite – see Table 2.1 in AS 1546.3                                                       |                       |           |           |
| For greywater – see Table 2.1 in AS 1546.4                                                    | Level 1 and Level 2   | Level 3   | Untreated |
| Top of bank of permanent water course                                                         | 10                    | 30        | 50        |
| Top of bank of intermittent water course                                                      |                       |           |           |
| Top of bank of a lake, bay or estuary                                                         |                       |           |           |
| Top water level of a surface water source used for agriculture, aquaculture or stock purposes |                       |           |           |
| Open stormwater drainage channel or drain                                                     |                       |           |           |
| Bore or a dam                                                                                 |                       |           |           |
| Unsaturated soil depth to a permanent water table (vertically)                                | 0.3                   | 0.6       | 1.2       |

① Distances are given in metres and are measured from the edge of the irrigated wetted area to any point of the feature.

② Note: Primary effluent typically has a (BOD<sup>5</sup>) (Biochemical Oxygen Demand) of between 120 -240 mg/L and Total Suspended Solids of between 65 -180 mg/L.

This design complies with these 2 tables.

## 7. Maintenance

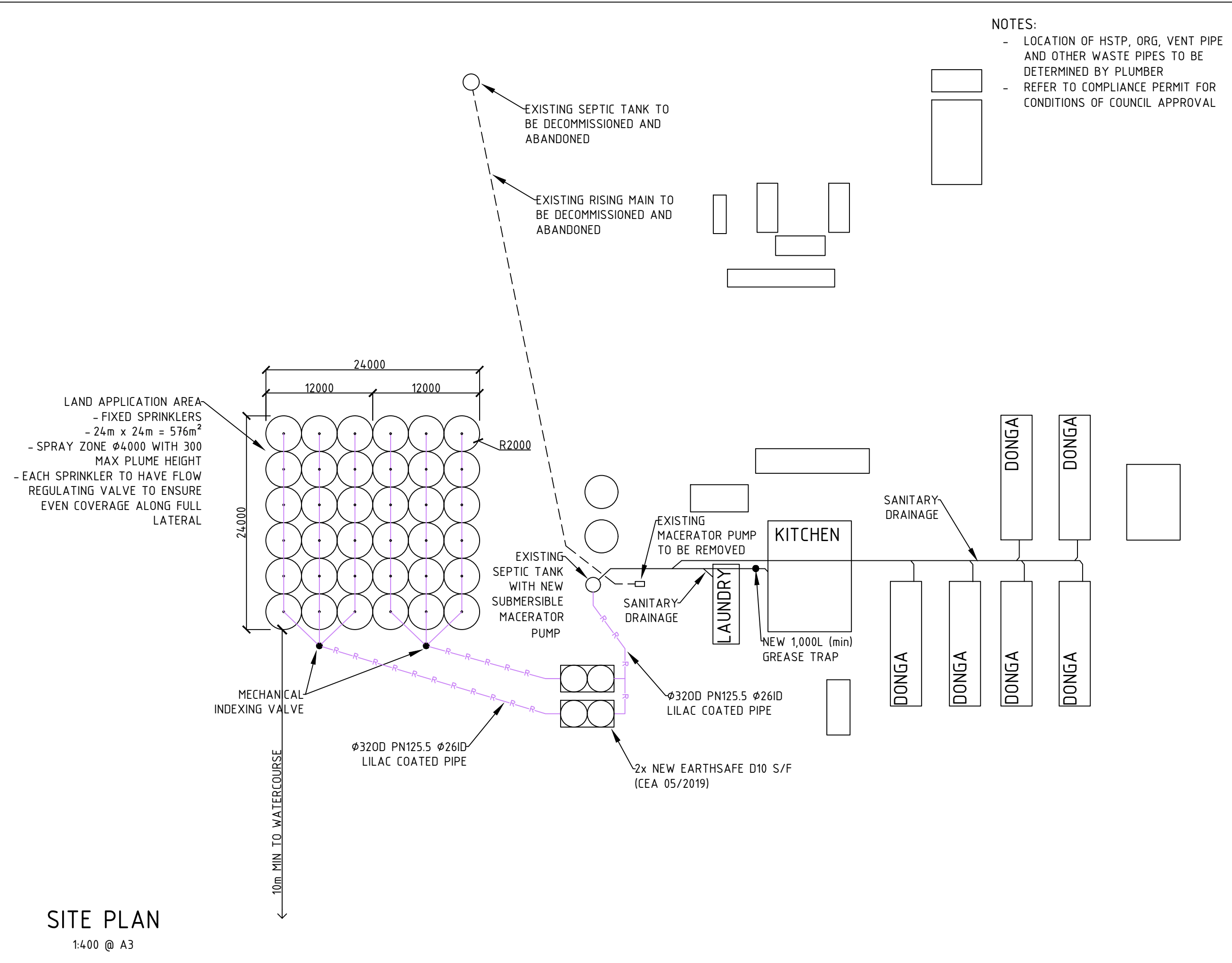
Maintenance requirements by the manufacturer are to be implemented. These include:

- Read the Owner's Manual that is provided with the treatment plant
- Follow the maintenance requirements specified by the manufacturer and authorised service agent
- Use low sodium biodegradable soaps and detergents
- No paints, solvents, chemicals, food scraps, fats, oils or any other solids to be disposed of "down the drain"
- Never turn power off to the treatment plant
- On-site sewage systems are not designed to cope with the flow from garbage grinders
- Vehicles, animals and general access to the land application area is to be generally restricted with warning signs erected
- Have warning signs, complying with AS1319 at the boundaries of the designated LAA in two places and clearly visible with wording such as "Recycled Water – Avoid Contact – DO NOT DRINK"

*MC Taylor*

Chris Taylor MEnvMan, BAppSc(Chem), ADCivEng Cert IV DWM003  
Director | Taylor Environmental (Australia) Pty Ltd  
23 April 2020

## **Appendix A      System Design Drawings**



| REVISIONS |          |            |            |
|-----------|----------|------------|------------|
| REV #     | DATE     | SUBJECT    | AUTHORISED |
| A         | 21/04/20 | REVISION A | C. TAYLOR  |
| B         | 23/04/20 | REVISION B | C. TAYLOR  |

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### WASTE WATER TREATMENT & EFFLUENT DISPOSAL SYSTEM SITE PLAN

|                      |            |
|----------------------|------------|
| AUTHORISED FOR ISSUE | DATE       |
|                      | 23/04/2020 |

NAME OF CLIENT LANEWAY RESOURCES

|           |            |
|-----------|------------|
| DESIGNER  | DATE       |
| M. MAHONY | 23/04/2020 |

|           |            |
|-----------|------------|
| DRAWN     | DATE       |
| M. MAHONY | 23/04/2020 |

LOT & PLAN 2SP242983

STREET ADDRESS  
2 RUNGALLA ROAD, FORSAYTH, QLD 4871

COUNCIL  
ETHERIDGE SHIRE

DRAWING DETAILS  
Site Layout

SCALE  
1:400

CLIENT REFERENCE #

|            |          |       |
|------------|----------|-------|
| JOB NUMBER | REVISION | DWG # |
| TE201127   | B        | SL1   |

|            |          |       |
|------------|----------|-------|
| JOB NUMBER | REVISION | DWG # |
| TE201127   | B        | SL2   |

EFFLUENT DISPOSAL CALCULATIONS

DAILY FLOW RATE: 120L PERSON / DAY  
SOIL ASSESSMENT: WELL DRAINING DECOMPOSED GRANITE  
SOIL TYPE: CATEGORY 2  
INDICATIVE PERMEABILITY: 1.4 – 3.0 m/d

EFFLUENT DISPOSAL AREA DETAILS

23 PEOPLE X 120 L / DAY = 2760 L / DAY  
DESIGN IRRIGATION RATE (DIR) = 5 mm / day  
MINIMUM TOTAL DISPOSAL AREA (A) = Q / DIR = 552 m²  
ACTUAL LAND APPLICATION AREA = 576 m²

PUMP CAPACITY

HEAD LOSS:  
OSSF = 2m  
RL = 1 m  
EFFLUENT RISING MAIN (OD 32mm PN 12.5 ID 26 mm LILAC COATED PIPE) = 4 m  
TOTAL HEAD LOSS = 7 m  
FLOW VELOCITY = 1.26 m / s

EFFLUENT FLOW RATE:  
PUMP DUTY: 7 m @ 60 L / MIN  
REQUIRED PUMP THEREFORE REQUIRES A FLOW OF 60 L / MIN AT 7 m HEAD LOSS  
AT 500 L / TRANSFER EACH TRANSFER LASTS 3.33 MINS

EFFLUENT WARNING  
SIGN TO BE AFFIXED  
TO TOP OF THE POST

75mm x 50mm  
HARDWOOD  
POST OR 100mm  
TREATED LOG

TYPICAL WARNING SIGN  
NTS

GREASE INTERCEPTOR TRAP (GIT) SERVICING

SERVICING IS NECESSARY TO CLEAN THE TRAP OF COAGULATED GREASE, FOOD SOLIDS AND ANY OTHER PARTICLES THAT COULD BLOCK OR OBSTRUCT THE OUTLET PIPE.

- AT EACH ANNUAL SERVICE (OR AS REQUIRED TO MAINTAIN GIT SO IT IS FULLY OPERATING), IT IS REQUIRED THAT:
- THE GREASE INTERCEPTOR TRAP IS PUMPED OUT COMPLETELY, INCLUSIVE OF ALL COMPARTMENTS INDIVIDUALLY
  - THE INTERNAL SURFACES ARE SCRAPED AND HOSED OFF
  - THE TRAP IS AT LEAST THIRD-FILLED WITH CLEAN WATER WHEN COMPLETE
  - ANY MAINTENANCE REQUIREMENTS, SUCH AS BROKEN BAFFLES, NON-COMPLIANCE, ETC. ARE TO BE INCLUDED IN THE SERVICE CONTRACTOR'S REPORT

INSTALLATION

IT IS THE INSTALLERS RESPONSIBILITY TO ENSURE THAT ALL COMPONENTS COMPLY WITH THESE GUIDES UPON COMMISSIONING OF THIS SYSTEM

THE INSTALLER SHALL ENSURE ALL IRRIGATION PIPEWORK AND FITTINGS COMPLIES WITH AS1477

ALL BURIED PIPEWORK IS TO BE IDENTIFIED WITH UNDERGROUND MARKING TAPE PLACED ABOVE THE PIPEWORK AND ALL PIPE IS TO BE LILAC COATED

ALONG THE BOUNDARY OF THE IRRIGATION AREAS THERE SHALL BE AT LEAST 2 WARNING SIGNS CLEARLY VISIBLE TO ADVISE THAT RECYCLED WATER IS USED FOR IRRIGATION (EACH SIGN SHALL COMPLY WITH AS1319 AND HAVE THE WORDING RECYCLED WATER – AVOID CONTACT DO NOT DRINK)

MAINTENANCE

REGULAR ROUTINE MAINTENANCE CHECKS OF THE IRRIGATION SYSTEM SHALL BE CARRIED OUT BY A LICENSED SERVICE AGENT

FITTINGS SHALL BE MAINTAINED IN CORRECT WORKING ORDER TO ENSURE PROPER PERFORMANCE BY THE LICENSED SERVICE AGENT

GENERAL NOTES – HSTP

1. THE SYSTEM INSTALLER IS RESPONSIBLE TO ESTABLISH THE LOCATION, LEVELS AND DEPTHS OF ALL EXISTING SERVICES ON-SITE PRIOR TO COMMENCING ANY WORKS
2. LOCATIONS AND SETOUT DIMENSIONS SHOWN ARE APPROXIMATE ONLY AND ARE TO BE CONFIRMED ON SITE. EXACT LOCATIONS OF THE PROPOSED WASTEWATER TREATMENT AND EFFLUENT DISPOSAL AREA
3. ACCESS AND LAY DOWN AREAS ARE TO BE CONFIRMED BY THE SYSTEM INSTALLER
4. EXISTING BUILDINGS AND EXTERNAL STRUCTURES SHOWN ON THESE DRAWINGS ARE OBTAINED FROM THE AVAILABLE INFORMATION AND MAY NOT BE COMPLETE AND ACCURATE
5. PLUMBING AND DRAINAGE TO AS / NZS 3500
6. ALL PIPE WORK TO AS / NZS 4020
7. ALL TANKS TO BE INSTALLED AND ANCHORED IN COMPLIANCE WITH THE MANUFACTURERS SPECIFICATIONS
8. FLEXIBLE JOINTS ON ALL INSTALLED TANKS (AS / NZS 3500)
9. THERE SHALL BE NO CROSS CONNECTION BETWEEN ANY WASTEWATER / EFFLUENT PIPE WORK AND ANY POTABLE WATER SUPPLY PIPEWORK
10. MINIMUM DISTANCE BETWEEN TANKS AND BUILDINGS TO BE MAINTAINED (AS/NZS 3500)
11. GRADE ALL BATTERS EVENLY AT 1 IN 5, UNLESS NOTED OTHERWISE
12. ANY SOILS ENCOUNTERED WHICH SHOW EVIDENCE OF CONTAMINATION ARE TO BE STOCKPILED SEPARATELY. CONTAMINATED SOIL SHALL BE HANDLED IN ACCORDANCE WITH ALL WORKPLACE HEALTH & SAFETY AND ENVIRONMENTAL REGULATIONS
13. IT IS THE INSTALLERS RESPONSIBILITY TO PROVIDE 3 COPIES OF ACCURATE ‘ AS CONSTRUCTED’ DRAWINGS TO THE RELEVANT LOCAL AUTHORITY AND INCUR ALL ASSOCIATED COSTS
14. ALL DISTURBED AREAS TO BE TURFED AND RECTIFIED
15. EXISTING TOPSOIL IS TO BE RETAINED AND SET ASIDE (WINDROWED) TO PREVENT DAMAGE FROM MACHINERY AND REDISTRIBUTED ONCE INSTALLATION IS COMPLETE
16. AT LEAST A 5 TONNE MACHINE FOR EARTHWORKS TO UTILISED
17. IT IS THE RESPONSIBILITY OF THE INSTALLER TO ENGAGE TAYLOR ENVIRONMENTAL (AUSTRALIA) PTY LTD TO UNDERTAKE INSPECTIONS DURING INSTALLATION. FAILURE TO DO SO WILL RESULT IN THE FORM 8 / COMMISSIONING CERTIFICATE NOT BEING ABLE TO BE COMPLETED

| <div><div></div></div> |                      |                          |                        |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|--------------------------|------------------------|
| REVISIONS                                                                                                                                                                                                                                                                       |                      |                          |                        |
| REV #                                                                                                                                                                                                                                                                           | DATE                 | SUBJECT                  | AUTHORISED             |
| A<br>B                                                                                                                                                                                                                                                                          | 21/04/20<br>23/04/20 | REVISION A<br>REVISION B | C. TAYLOR<br>C. TAYLOR |
| <div>TAYLOR ENVIRONMENTAL</div> <div></div> <div>QBCC LICENCE NUMBER<br/>150 556 72<br/>ABN NUMBER 95268308955</div>                                                                         |                      |                          |                        |
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| <div>WASTE WATER TREATMENT &amp; EFFLUENT DISPOSAL SYSTEM<br/>SITE PLAN</div>                                                                                                                                                                                                   |                      |                          |                        |
| AUTHORISED FOR ISSUE                                                                                                                                                                                                                                                            |                      | DATE                     |                        |
|                                                                                                                                                                                            |                      | 23/04/2020               |                        |
| NAME OF CLIENT LANEWAY RESOURCES                                                                                                                                                                                                                                                |                      |                          |                        |
| DESIGNER                                                                                                                                                                                                                                                                        |                      | DATE                     |                        |
| M. MAHONY                                                                                                                                                                                                                                                                       |                      | 23/04/2020               |                        |
| DRAWN                                                                                                                                                                                                                                                                           |                      | DATE                     |                        |
| M. MAHONY                                                                                                                                                                                                                                                                       |                      | 23/04/2020               |                        |
| LOT & PLAN 2SP242983                                                                                                                                                                                                                                                            |                      |                          |                        |
| STREET ADDRESS<br>2 RUNGALLA ROAD, FORSAYTH, QLD 4871                                                                                                                                                                                                                           |                      |                          |                        |
| COUNCIL<br>ETHERIDGE SHIRE                                                                                                                                                                                                                                                      |                      |                          |                        |
| DRAWING DETAILS<br>NOTES                                                                                                                                                                                                                                                        |                      |                          |                        |
| SCALE                                                                                                                                                                                                                                                                           |                      | N/A                      |                        |
| CLIENT REFERENCE #                                                                                                                                                                                                                                                              |                      |                          |                        |
| JOB NUMBER                                                                                                                                                                                                                                                                      |                      | REVISION                 | DWG #                  |
| TE201127                                                                                                                                                                                                                                                                        |                      | B                        | SL3                    |

## Appendix B      Bore Log

[illegible]