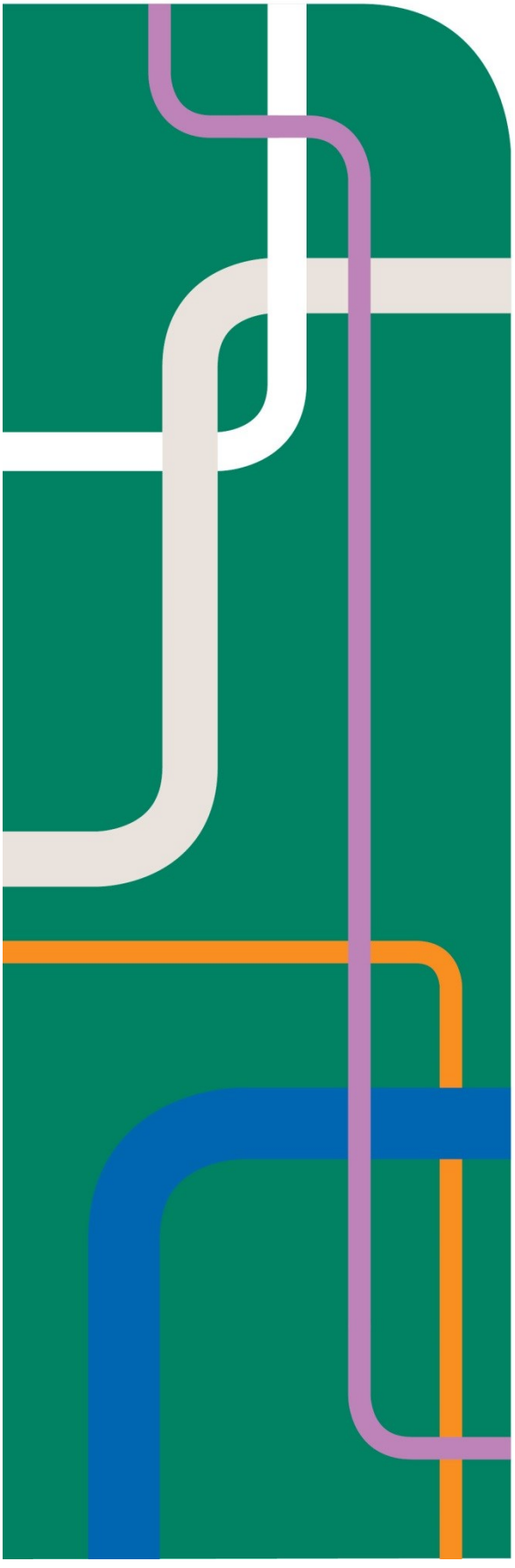
Government of South Australia

SA Water



Engineering Services

Technical Standard
TS 0520

Methods of Temporary Storage and Transfer of Sewage

Revision: 1.0
Date: 15 December 2016

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Application & Interpretation of this Document

It is the responsibility of the users of this Standard to ensure that the application of information is appropriate and that any designs based on this Standard are fit for SA Water's purposes and comply with all relevant Australian Standards, Acts and regulations.

Users of this Standard accept sole responsibility for interpretation and use of the information contained in this Standard. Users should independently verify the accuracy, fitness for purpose and application of information contained in this Standard.

Only the current revision of this Standard should be used which is available for download from the SA Water website.

Significant/Major Changes Incorporated in This Edition

This is the first issue of this Technical Standard.

This document has been developed based on SA Water's technical guideline TG 128 which it replaces.

The general format of the document has been changed to align with the new standards template.

Original text modified and updated, with Clause numbering changed.

Document Controls

Revision History

Revision	Date	Author	Comments
1.0	15 Dec 2016	T Galek	

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http://river.sawater.sa.gov.au/applications/bms/Corporate/Cool Buttons Quick Reference Guide.docxhttp://river.sawater.sa.gov.au/applications/bms/Corporate/Cool Buttons User Guide.docx

1 Introduction

SA Water is responsible for the operation and maintenance of an extensive amount of engineering infrastructure.

This standard has been developed to assist in the design, construction, management and maintenance of this infrastructure.

This technical standard is not intended to be prescriptive and allows for advances in technology, materials and construction techniques. Where innovative solutions or construction approaches become available that could provide benefit to the design, construction process, or safety of these types of structures, then they should be considered during the design process in consultation with SA Water.

1.1 Purpose

The purpose of this standard is to detail minimum requirements to ensure that assets covered by the scope of this standard are constructed and maintained to consistent standards and attain the required asset life.

1.2 Glossary

The following glossary items are used in this document:

Term	Description
SA Water	South Australian Water Corporation
TG	SA Water Technical Guideline
TS	SA Water Technical Standard

1.3 References

1.3.1 Australian and International

The following table identifies Australian and International standards and other similar documents referenced in this document:

Number	Title
AS 3600	Concrete Structures
AS2638.2	Gate Valves for Waterworks Purposes, Part 2 (Resilient seated)
	SA Work Health and Safety Act (2012)
	Water Industry Act (2012)
	Water Industry Regulations (2012)
	Environmental Protection Act (1993)
	Environment Protection Water Quality Policy (2003)
	Public and Environmental Health Regulations (2010)
	EPA Guideline for Bunding and Spill Management (EPA 080/12)

Number	Title
	EPA Air Quality Policy (2016)
	EPA Noise Policy (2007)

1.3.2 SA Water Documents

The following table identifies the SA Water standards and other similar documents referenced in this document:

Number	Title
TS 80	Solar Power Systems
TS 107	Physical Security Systems
TS 155	Safety In Design Technical Standard
TS 0350	SCADANet, SCADA and DCS Systems - Functionality
TS 0351	SCADANet, SCADA and DCS Systems – Design Philosophy
TS 0352	SCADANet, SCADA and DCS Systems - Implementation
TS 0502	Authorised Products for Gravity and Pressure Sewer Systems
	SA Water Sewer Construction Manual (SCM)

1.4 Definitions

The following definitions are applicable to this document:

Term	Description
SA Water's Representative	The SA Water representative with delegated authority under a Contract or engagement, including (as applicable): • Superintendent's Representative (e.g. AS 4300 & AS 2124 etc.) • SA Water Project Manager • SA Water nominated contact person
Responsible Discipline Lead	The engineering discipline expert responsible for TS 0520 defined on page 3 (via SA Water's Representative)

1.5 Disclaimer

- SA Water reserves the right to alter, amend or withdraw this document, at any time, without prior notice.
- Information within this document is correct at time of publication errors and omissions excepted (E&OE). The date of publication of this document can be found on the front page, and, in the left hand corner of the footer on each subsequent page.

2 Scope

This technical standard specifies SA Water minimum requirements for the temporary storage and transfer of sewage in situations where the land intended for development is remote from the Corporation's existing sewer reticulation network.

This technical standard is intended to advise Developers and their Designers when developing designs for such solutions, as well as to provide a consistent approach by the development industry and SA Water where possible.

3 Temporary Storage or Transfer of Sewage

3.1 General

Temporary storage shall only be considered when no gravity or pumped transfer system is immediately available or is able to be installed within a practical timeframe.

Temporary storage or transfer facilities may be installed and operated by the Developer or SA Water or their representative. In all cases the infrastructure and operation and maintenance arrangements must be approved by SA Water before installation.

Installation approval will include a site specific Agreement as part of the Development Agreement Formal Instrument entered into between SA Water and the Developer. This agreement will include when the temporary installation will be removed and the permanent gravity or pumped infrastructure will be installed.

3.2 Initial Request for Temporary Storage or Transfer of Sewage

Before any formal request is submitted it is recommended that the Developer or Consultant checks with SA Water to confirm that no acceptable conventional solutions are initially available and, if required, review the available temporary storage or sewage transfer options.

Temporary services may, with SA Water approval, be used in the following applications:

- land divisions with remote staged development
- large land developments where initially no sewer infrastructure collection facilities are available
- other large scale industrial facilities where initially no sewer infrastructure collection facilities are available
- Any other difficult to service short term installation approved by SA Water.

These facilities, including tanks and sewage pump stations must be located on land owned by the Developer or on land for which a written agreement for use has been reached with the Owner.

SA Water have a duty of care and a commitment to the EPA to ensure the system is robust enough to last for the term of the Development Agreement Formal Instrument and that it will be operated and maintained in such a way that there will be no overflows into local stormwater system or impact on the local environment.

3.3 Site Specific Agreement

Any agreements for temporary storage or transfer will be short term (nominal maximum period of 3 years) and will specify a timeframe, a number of property connections or a combination of both options, by which time the permanent infrastructure must be in place and ready for the transfer of operations.

The specific details of the arrangements, including length of time of operation and detailed design of any private onsite pump station(s) or storage, should be included in the sewer design plans and form part of the Development Agreement Formal Instrument.

Special conditions are listed under Schedule 3 v - Special Conditions of the Development Agreement Formal Instrument.

3.4 Safety in Design Considerations

When designing temporary storage and transfer systems, a Safety in Design risk assessment should be conducted in compliance with SA Work Health and Safety Act 2012 and SA Water's TS 155.

4 Design, Operation and Environmental Requirements

To ensure the design, operational and environmental requirements are satisfied, the following general topics should be addressed and provided to SA Water prior to the formal application. These are in addition to the specific requirements for the available options as detailed in Section 5.

4.1 Site Design Information

The following site design information shall be provided:

- A schedule that indicates the staging of the development, the progress of the construction, number of allotments created, and number of allotments occupied.
- A scaled locality plan that identifies the land parcel and allotments, adjacent dwellings, buildings and adjacent land use.
- A detailed layout plan within the allotment showing tanks, extent and capacity of bunded area, layout of sewage mains, site drainage and grading.
- Access road to the site, including anticipated truck turning area. All weather road access is to be provided to the site for operation and maintenance purposes. The road shall be maintained for the duration of the operation. Typical access road information is shown in SA Water's SCM.
- Details of provision of adequate power site supply and lighting.
- Details of provision of an adequate dedicated metered water supply is to be provided (min 25 mm services) and suitable wash-down points and appropriate facilities (egg taps and hoses) are to be available.

4.2 Storage and Transfer Facility

- Details of the amount of storage buffer capacity for sewage inflows. SA Water's Treatment and Network Planning /Systems Planning group have established the following values to be used to determine the flows:
    - 200 Litres/person/day
    - 500 litres/dwelling/day
- Details of wastewater collection at the storage site
- Size, location and operating parameters of any private Sewer Pumping Stations (SPS) and associated private pumping main including size, route, laying details etc.
- Details of the "link up" to the SA Water sewer network
- Details of any storage tanks and the proposed system of operation, e.g. above ground tanks, below ground chambers, and material used for the tanks
- If above ground storage tanks are to be used the tank(s) are to be enclosed in a non-permeable bund. Refer to EPA Guideline for Bunding and Spill Management (available via the EPA website).
- Identification of a suitable solution to deal with sludge settling within tanks, e.g. by designing the shape of the tank base to drain to the discharge point and to eliminate build-up of sludge
- Identification of a suitable solution for control of odours to meet EPA Air Quality Policy for separation distances. Venting may be required depending on the operation of the pumping / tankering arrangement and the proximity of dwellings. SA Water will monitor the situation and inform the Developer of any subsequent venting requirements.
- Identification of a suitable solution for control of noise caused by the SPS pump(s) transferring the sewage into the sewer network, or by tankering vehicle to achieve EPA Noise Policy requirements.

4.3 Operational Procedures

The following operational procedure information shall be provided:

- Provision of a risk assessment for the proposed installation. The risk assessment is to identify all potential issues that could arise from the activities within the land parcel and identify mitigation strategies i.e. equipment breakdown, spill, odour, noise, stormwater, sludge and security.
- Description of how the storage and transfer system will operate, including a typical schedule of anticipated flows and tanker movements, if required, to cater for the sewage volume
- If the tankering is required the project Owner shall arrange for the nominated tankering Contractor to be the primary responder, with a back-up alarm at an "extra high sewage level" to SA Water metro telemetry to alert Operations staff
- Contractor's operation and maintenance schedules to be used to manage the facility including details of proposed staffing arrangements, e.g. own staff, local contractor, lease - operate - maintain contract.

- Identify methods of dealing with spills of sewage that represents a risk to human health or could cause environmental harm.
- Methods of dealing with stormwater within bunded area.

4.4 Security of Facility and Signage

The Owner of the private temporary facilities is responsible for provision of:

- adequate site lighting
- fencing, with suitable gates for maintenance access, including tankering if required.

The Owner is also responsible for providing adequate and relevant signage which identifies the following:

- type of facility
- owner / operator details
- relevant contact details in case of emergency

Refer TS107 for details.

4.5 Additional Requirements if SA Water is to Operate and Maintain the Facility

The following additional items shall be required if SA Water is to operate and maintain the facility:

- Provision of telemetry which is compatible with SA Water SCADA (Supervisory Control and Data Acquisition) system. Refer SA Water's TS 80 and TS 0350 to TS0352.
- Duplicate copy of keys to locked gates (fencing) to be provided to SA Water.
- Provision of 40 mm metered water supply service (refer SCM drawings M11 and M20)

5 Available Temporary Storage and Transfer Arrangements

A limited number of temporary options are available for the storage and transfer of sewage while the system augmentation proposal is developed and constructed. They include:

1. Temporary private sewer pumping station and private pumping main
2. Temporary private on-site storage with tankering
3. Temporary private on-site treatment and disposal

5.1 Temporary Private Sewer Pump Station and Private Pumping Main

A temporary private SPS and private pumping main can be approved by SA Water where the initial stage of the proposed development area is too far from an available sewer network to be serviced by gravity.

Where approval is given for such installation, the station and main must be off the road either in the verge or on an adjacent block of land. A typical layout is shown as Figure 1.

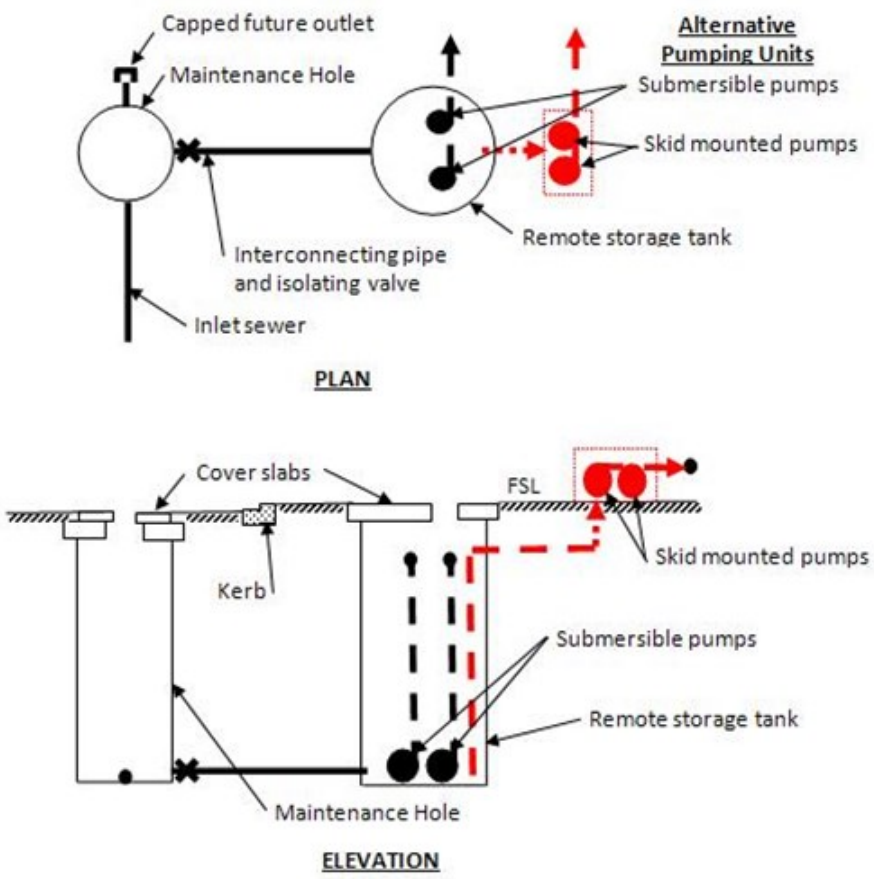

Figure 1 – Temporary private SPS and pumping main

Specific requirements for temporary SPS are as follows:

- Use of Maintenance Holes (MH) as a temporary SPS is not permitted
- SPS are not permitted to be located in the road carriageway
- Temporary SPS can be concrete (AS3600), fibreglass (GRP), polyethylene (PE) or SA Water approved equivalent. Buried GRP or PE tanks are acceptable providing they are installed in accordance with manufacturer's requirements
- No single pump sewage pumping systems are allowed
- A dual pump system is required and the setup is to be such that 1 pump is on-line and the other is to act as the standby pump. Allowance is to be provided so that this configuration can be simply alternated as required by to operators
- Pumps are to be selected such that each pump can handle the full design flow capacity of the station
- Skid Mounted pumping units may be used with SA Water approval
- High, low and emergency level control signals are to be provided and connected to the pumping unit switchboard to allow for pump stop/start as required
- An emergency high level alarm warning and response system is to be provided under the operating and maintenance schedule
- The interconnecting pipework is to include an isolating valve (Resilient Seated Stop Valve - ref AS2638.2). During decommissioning this valve is to be closed and the valve and adjacent pipework can remain in-situ but its operating spindle and access facilities must be removed.

5.2 Temporary Private On-Site Storage With Tankering

Temporary on-site storage for the purpose of tankering is a viable option for large sub-divisions for which there is no collection sewer immediately available. The sewage is pumped from suitable MHs into holding tanks for storage prior to tankering.

The storage tank(s) can be partially or fully buried, placed at ground level, or if appropriate in an elevated location. They must be located in a dedicated area which has sufficient land for future expansion (if required) and access for tanker loading and operational and maintenance activities. The design storage capacity is to be based on the proposed tankering capacity and collection timeframe e.g. number of trips per day or week etc. plus a 100% emergency allowance.

A typical layout is shown as Figure 2.

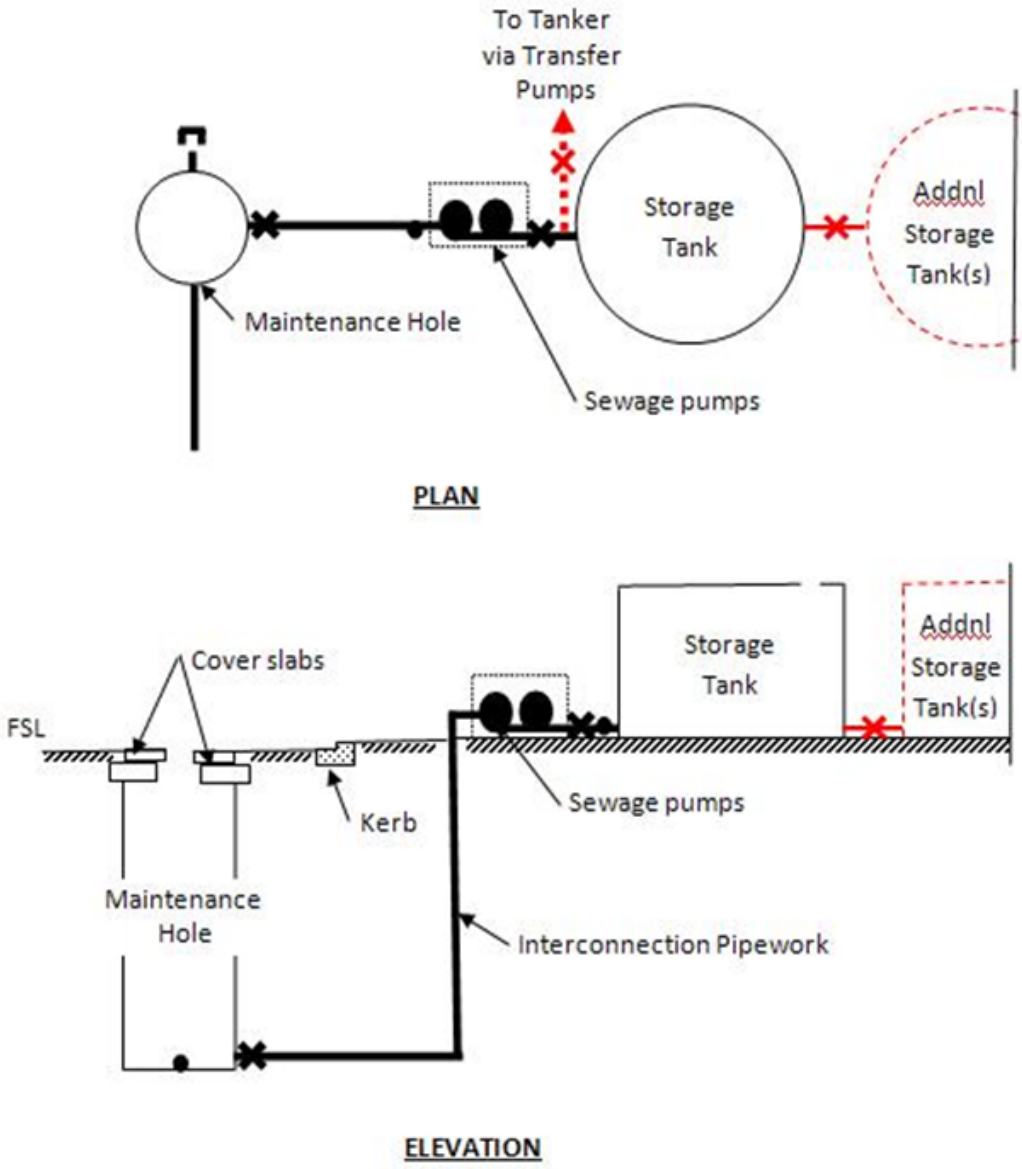

Figure 2 – Temporary on-site storage with tankering

Specific requirements for temporary on-site storage with tankering are as follows:

- Any type of water storage tank can be considered providing the interior surface is impervious to the effects of hydrogen sulphide gas (H_2S) and other chemical or biological attack caused by the raw sewage.
- Consideration should be given to buried tanks floating and above ground tanks being moved or blown over by strong winds.
- Ground level or elevated tanks are to be enclosed in a non-permeable bund that provides storage equal to 120% of the tank(s) volume + freeboard of 200mm.
- If there is more than one tank, all tanks are to have interconnecting pipework (with isolating valves) which are to allow any tank to be used as the main storage tank and individual or multiple tanks to be discharged / pumped directly to the tanker.
- Tank(s) are to be sealed with appropriate ventilation (control of odours)
- A common pumped tanker loading point is recommended
- Tanks can have individual or a common inlet / outlet arrangement

5.3 Temporary Private On-Site Treatment and Disposal

Temporary private on-site treatment and disposal may be a viable option for large sub-divisions. Commercially produced package sewerage treatment plants are available for purchase, hire or on a supply, operate and maintain basis.

Allowance must be made for the ultimate treatment capacity requirements for the area being serviced under Development Agreement Formal Instrument. This may include obtaining a package plant large enough to handle the sewage volume expected during specified timeframe or one to which additional modules can be added as the demand unexpectedly increases.

Collected sewage shall be treated to a standard which is appropriate for its disposal or its intended further use as non-drinking water.

There are a number of legislative documents and codes of practice applicable to sewage treatment and effluent management, which include the Water Industry Act, Environmental Protection Act, Environment Protection Water Quality Policy, and Public and Environmental Health Regulations.

A typical layout is shown as Figure 3.

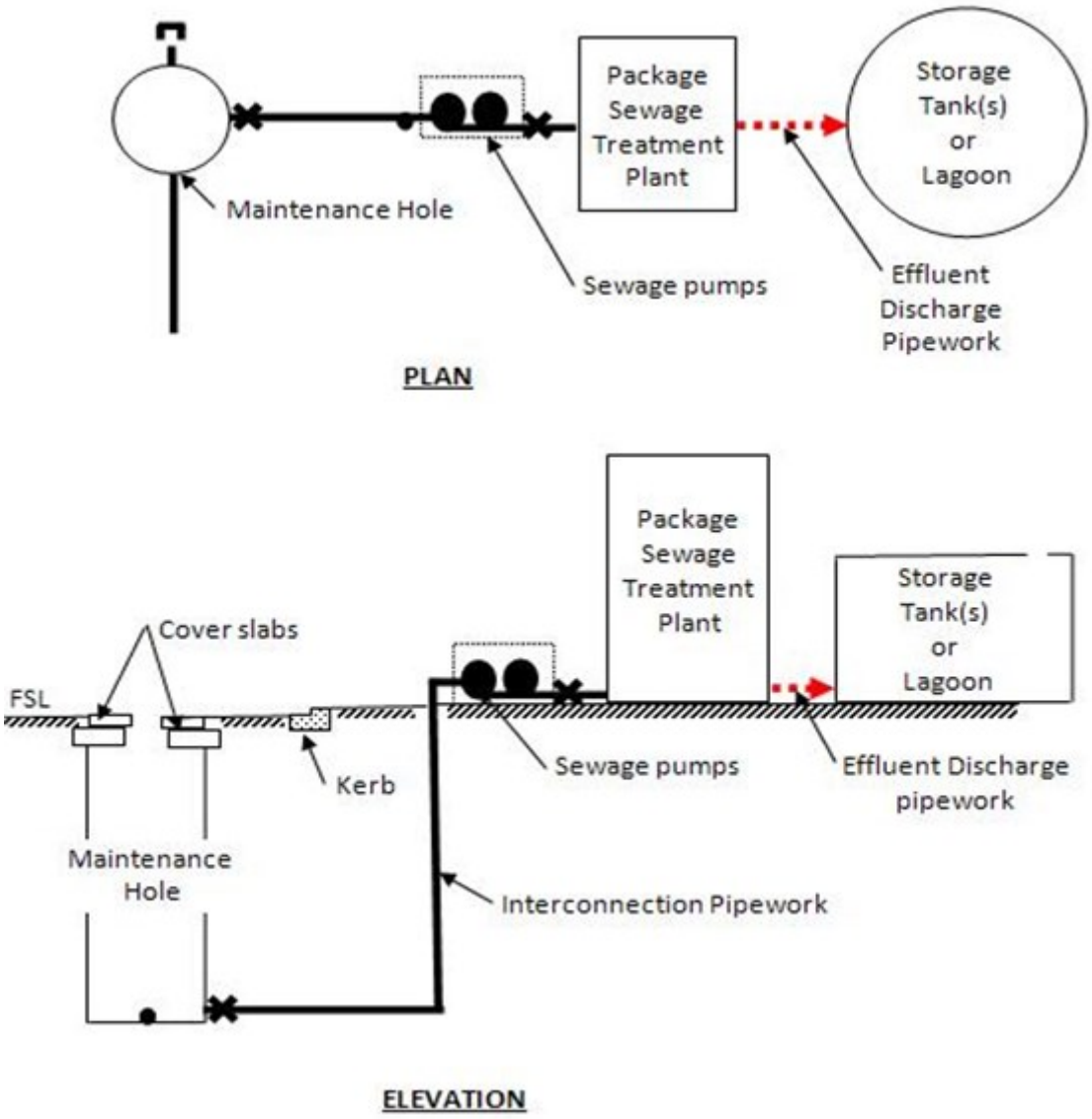

Figure 3 – Temporary on-site treatment and disposal

Specific requirements for on-site treatment and disposal are as follows:

- Private package treatment plant to be operated by a licensed sewage treatment plant operator
- An emergency operation failure and high level alarm warning and response system is to be provided under the operating and maintenance schedule
- Where appropriate a non-drinking (recycled) water management system to be in place prior to the plant becoming operational and the operating and maintenance schedule is to including a water quality monitoring requirement.
- Where appropriate, non-drinking (recycled) water discharge points to be labelled “Non-drinking Water”

6 Decommissioning of Temporary Storage and Transfer Facilities

The temporary storage and transfer system is to remain in place until the permanent facilities have been installed, tested and are fully operational. Once the permanent facilities are fully operational it is the Owner’s responsibility to return the temporary facilities site to its original condition or if part of a subdivision to a saleable condition.

Temporary on-site storage, treatment and disposal facility shall be removed at Owner’s cost when it is no longer required.