Public Works

BOURKE SEWAGE TREATMENT PLANT AND COLLECTION SYSTEM

POLLUTION INCIDENT RESPONSE MANAGEMENT PLAN

Report Number: WS 12085

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BOURKE SHIRE COUNCIL

Public Works

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Foreword

The Pollution Incident Response Management Plan (PIRMP) for the Bourke Sewerage Scheme is a document that has been developed to be used by Bourke Shire Council (MSC) in the operation and management of incidents at the Bourke Sewage Treatment Plant (STP) and the sewage collection and transport system.

The purpose of this plan is to ensure that, where possible, pollution incidents are avoided but if they do occur they are managed appropriately to minimise the impacts on the environment and to human health.

This PIRMP addresses the requirements under the *Protection of the Environment Legislation Amendment Act* (POELA) 2011.

The objectives of the plan are to:

- communicate in a timely manner and with sufficient detail about a pollution incident to relevant authorities and people outside the facilities who may be affected by the impacts of the pollution incident;
- minimise and control the risk of any pollution incident occurring at the facilities by identification of risks and the development of planned actions to minimise and manage those risks; and
- ensure that the plan is properly implemented by trained staff, identifying persons responsible for implementing it, and ensuring that the plan is regularly tested for accuracy, currency and suitability.

This management plan is to be continually updated and reviewed by Peter Brown Manager of Works at Bourke Shire Council and Council's Work Health and Safety (WHS) committee.

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1 Introduction

The township of Bourke is located approximately 370 km north west of Dubbo in the Bourke Local Government Area (LGA).

ABS Census data for 2011 found a residential population of approximately 2,000 for the Bourke "Urban Centre/Locality" which is a suitable indicator for the sewered population. The ABS Census "Urban Centre/Locality" population for Bourke has been steadily declining since 1981, when the population was approximately 3,300.

Bourke Shire Council (BSC) owns and operates the Bourke Sewerage Scheme which includes a Sewage Treatment Plant (STP) and the collection system servicing the town.

1.1 Collection and Transport System

The Muswellbrook sewage collection system comprises the following:

- Gravity mains,
- Seven (7) Sewage Pumping Stations (SPS) as shown in **Figure 1.1**, and
- Rising mains (from each SPS).

The original sewerage scheme, comprising gravity mains, a SPS in Mertin St, a SPS in Warraweena St and a trickling filter type plant, was constructed in the early 1950s.

Council installed another two pump stations, one in Becker St (SPS 3) and one at the end of Anson St (SPS 4) as a result of town expansion including a small pump station near the Showground/Racecourse now referred to as Renshaw SPS (i.e. SPS 7).

In the early 1970s it became apparent that the STP was overloaded and as a result a new oxidation pond type plant was constructed in 1984.

1.2 Sewage Treatment Plant (STP)

The current STP is located off Weir Rd, approximately 2km west of the centre of town, 500m west (external) of the town levee. The STP, excluding effluent evaporation area, is located above the 1864 flood level i.e. maximum recorded flood level (106.61).

The STP comprises the following treatment/process units:

- Main inlet pit with combined effluent outlet pit (EP1);
- Two (2) raw sewage inlet pits (EP2 & EP3);
- Two (2) oxidation ponds in series;
- Maturation pond;
- Effluent discharge pit; and
- Effluent overflow pit.

The location of the Bourke STP is shown in **Figure 1.2.**

All sewage from the main part of town is pumped to the STP from SPS 2 in Mertin St through a pipeline which joins a 300 mm uPVC main at the STP and subsequently into the inlet pits. A separate rising main transports sewage from Alice Edwards Village (west of Bourke) directly to the STP via a 150 mm uPVC main. Thus two mains enter the STP.

Sewage gravitates from the main inlet pit (EP1) to Oxidation Pond No.1, where suspended solids and organic wastes are removed by sedimentation, before flowing into a second oxidation pond for further sedimentation of suspended solids and organic wastes.

Effluent from Oxidation Pond No.2 gravitates to the Maturation Pond for destruction of pathogens by UV light from the sun before gravitating to the effluent evaporation area via an effluent discharge pit. The area provided for effluent evaporation does not lie above the maximum recorded 1864 flood level, according to 1984 WAE drawings in ***Ref 3.***

The STP has the ability to recirculate effluent from the outlet chamber in EP1 across to the inlet chamber in EP1 by a permanently installed submersible pump.

1.3 Scope of the PIRMP

The scope of the plan is as follows:

- Description and likelihood of hazards;
- Pre-emptive actions to be taken;
- Inventory of pollutants;
- Safety equipment;
- Contact details;
- Communicating with neighbours and/or the local community;
- Minimising harm to persons on the premises;
- Maps shown location of scheme components;
- Actions to be taken during or immediately after a pollution incident; and
- Staff training.

Figure 1.1: Location of SPS

Figure 1.2: Location of Bourke STP

2 Context of the Assessment

2.1 Background

A new provision under the *Protection of the Environment Legislation Amendment Act* (POELA) 2011 is the requirement to prepare, keep, test and implement a Pollution Incident Response Management Plan (PIRM) for each environmental protection licence that Council holds.

The objectives of these plans are to:

- communicate in a timely manner and with sufficient detail about a pollution incident to relevant authorities and people outside the facilities who may be affected by the impacts of the pollution incident;
- minimise and control the risk of any pollution incident occurring at the facilities by requiring identification of risks and the development of planned actions to minimise and manage those risks; and
- ensure that the plan is properly implemented by trained staff, identifying persons responsible for implementing it, and ensuring that the plan is regularly tested for accuracy, currency and suitability.

The NSW EPA defines a "pollution incident" as follows;

> "an incident or set of circumstances during or as a consequence of which there is or is likely to be a leak, spill or other escape or deposit of a substance, as a result of which pollution has occurred, is occurring or is likely to occur. It includes an incident or set of circumstances in which a substance has been placed or disposed of on premises, but it does not include an incident or set of circumstances involving only the emission of any noise."

A pollution incident is required to be notified if there is a risk of "material harm to the environment", which is defined in section 147 of the POEO Act as:

> "(a) harm to the environment is material if:
>
> (i) it involves actual or potential harm to the health or safety of human beings or to ecosystems that is not trivial, or
>
> (ii) it results in actual or potential loss or property damage of an amount, or amounts in aggregate, exceeding $10,000 (or such other amount as is prescribed by the regulations), and
>
> (b) loss includes the reasonable costs and expenses that would be incurred in taking all reasonable and practicable measures to prevent, mitigate or make good harm to the environment."

Industry is now required to report pollution incidents *immediately* to the EPA, NSW Health, Fire and Rescue NSW, WorkCover NSW and the local council. 'Immediately' has its ordinary dictionary meaning of promptly and without delay. These strengthened provisions will ensure that pollution incidents are reported directly to the relevant response agencies so they will have direct access to the information they need to manage and deal with the incident in as fast a time as is practical.

The NSW EPA requires a plan to be implemented commencing 1st of September 2012 for all existing licence holders. Council holds EPL No. 2384 for the Bourke Sewerage Scheme i.e. STP and collection and transport system.

2.2 Council Commitment

The Local Government Act contains a Charter for Local Government which describes the approach to supplying services and activities. It charges local government with a number of responsibilities including, but not limited to, the following:

- to provide directly or on behalf of other levels of government, after due consultation, adequate, equitable and appropriate services and facilities for the community and to ensure that those services and facilities are managed efficiently and effectively
- to exercise community leadership
- to properly manage, develop, protect, restore, enhance and conserve the environment of the area for which it is responsible, in a manner that is consistent with and promotes the principles of ecologically sustainable development
- to bear in mind that it is the custodian and trustee of public assets and to effectively account for and manage the assets for which it is responsible
- to engage in long-term strategic planning on behalf of the local community
- to keep the local community and the State government (and through it, the wider community) informed about its activities

2.3 Regulatory and Formal Requirements

The regulatory and formal requirements applicable to the Bourke Sewerage Scheme are shown in **Table 2.1**. These legislative and licensing requirements and guidelines are to be met to ensure the protection of environmental and public health and to satisfy Work Health and Safety (WHS) requirements. This management plan addresses how these requirements are to be met.

Table 2.1 : Formal and Regulatory Requirements

PARAMETER	INSTRUMENT		ADMINISTERED BY
Overall Scheme Operation	*Water Management Act 2000*	• Granting of water licenses • Integrated management of water resources	NSW EPA
	Local Government Act 1993 – Section 60	• Approval to construct extend water supply/treatment works	NSW Office of Water (NOW)
	Catchment Management Authorities Act 2003	• Management of natural resources at a catchment level	Central West Catchment Management Authority (CMA)
	Protection of the Environment Operations Act (POEO) 1997 – Section 55	• Granting/refusal of Environment Protection Licence (EPL)	NSW EPA
Public Health	*Public Health Act 2010*	• Promotion, protection and improvement of public health • Control risks to public health • Promote control and prevent spread of infectious diseases	NSW Health
Environmental Health	*Protection of the Environment Operations Act (POEO) 1997*	• Protection, Restoration and Enhancement of the quality of the environment	NSW EPA

	Protection of Environmental Legislation Amendment Act 2011	• Pollution Incident Reponse Management Plan (PIRMP) compliance	
Work Health & Safety (WHS)	*Work Health and Safety Act 2011*	• Promote and ensure health and safety of workers	WorkCover Authority
Plumbing	*AS/NZS 3500 - Plumbing and Drainage Code 1996-2003*	• Ensures all pipework associated with recycled water schemes is installed in accordance with standard	Bourke Shire Council (BSC)

The Manager of Works at Bourke Shire Council is responsible for the review and evaluation of this plan and for meeting the regulatory and other requirements.

2.4 NSW EPA Licence.

Bourke STP is covered by Environment Protection Licence (EPL) No. 11570.

The following are requirements of EPA licence:

- Daily flow monitoring of influent occurs at the Mertin St SPS (SPS 2) and the monitoring point is designated as EPA MONITORING POINT #2.
- Monthly composite sampling of effluent occurs at the effluent discharge pit, designated as EPA MONITORING POINT #1, for the following six parameters:

  Parameters to be monitored and 100%ile limits

  - *Biological Oxygen Demand (BOD) – 15 mg/L*
  - *Total Suspended Solids (TSS) – 20 mg/L*
  - *Total Nitrogen (TN) – 15 mg/L*
  - *Total Phosphorus (TP) – 10 mg/L*
  - *Oil and Grease (O&G) – 10 mg/L*
  - *pH – 6.5 – 8.5*

3 Assessment of the Risks

3.1 Risk Assessment – Bourke STP and Collection System

A risk assessment of the STP and Sewerage Pump Stations (SPSs) was undertaken with one of the Bourke Operators on the 4th of October 2012. The objective of the assessment was to:

- identify the hazards,
- identify hazardous events
- assessment of the likelihood of the event and other factors that may increase the likelihood
- assess the impacts
- assess the overall risk.

Shown in **Table 3.1**, **Table 3.2** and **Table 3.3** are the likelihood, impact and risk criteria used in the assessment.

Table 3.1: Definitions of Likelihood

Level	Likelihood	Description
A	Almost certain	The event is expected to occur often (several times per year)
B	Likely	The event will probably occur often (once every 1-3 years)
C	Possible	The event might occur at some time (once every 3 to 10 years)
D	Unlikely	The event could occur at some time (once every 20 years)
E	Rare	The event may occur only in exceptional circumstances (once every 100 years)

Table 3.2: Definitions of Impact

Level	Classification	Description
1	Insignificant	The overflow is extremely unlikely to drain to a local sensitive environment* and: • Where the overflow reaches waters, the volume of contaminant likely to enter the waterways is insignificant with regard to the volume and flow of receiving waters, or • Where the overflow reaches land, it is likely to be contained in an area with little chance of public exposure within the maximum response time**
2	Minor	The overflow is unlikely to drain to a local sensitive environment* and: • Where the overflow reaches waters, the volume of contaminant likely to enter the waterways may be significant with regard to the volume and flow of receiving waters, or • Where the overflow reaches land, it is likely to be contained in an area where the public exposure is minimal given the maximum response time**

3	Moderate	The overflow is likely to drain to a local sensitive environment* and: • Where the overflow reaches waters, the volume of contaminant likely to enter the waterways is significant with regard to the volume and flow of receiving waters, or • Where the overflow reaches land, it may travel to an area where public exposure is low within the maximum response time**
4	Major	The overflow is likely to drain to a local sensitive environment* and: • Where the overflow reaches waters, the volume of contaminant likely to enter the waterway is high with regard to the volume and flow of receiving waters, or • Where the overflow reaches land, the public exposure risk is likely given the maximum response time**
5	Catastrophic	The overflow is likely to drain to a local sensitive environment* and: • Where the overflow reaches waters, the volume of contaminant likely to enter the waterways is high with regard to the volume and flow of receiving waters, or • Where the overflow discharges to land, the public exposure risk is high given the maximum response time**

*A sensitive environment includes: a drinking water catchment or domestic groundwater source, or shellfish growing area, or protected water bodies, ecological communities or conservation areas defined by legal an non-legal instruments, such as local environment plans (LEPs), State environmental planning policies (SEPPs), national parks, and class P or class S waters, or waterways used for primary contact recreation, or a recreational area or other area with high public exposure o associated health risk.

**Maximum response time should be based on the length of time taken for the licensee to detect the overflow, or for the overflow to be reported, and the time taken for the licensee to attend the site and secure against public contact

Table 3.3: Risk Analysis Criteria

Likelihood	**Impacts**				
	Insignificant **1**	Minor **2**	Moderate **3**	Major **4**	Catastrophic **5**
Almost Certain – **A**	Low	Moderate	High	Very High	Very High
Likely – **B**	Low	Moderate	High	Very High	Very High
Possible – **C**	Low	Moderate	Moderate	High	Very High
Unlikely – **D**	Low	Low	Moderate	High	Very High
Rare – **E**	Low	Low	Low	Moderate	High

Table 3.4: STP Risk Register

	Contaminant	Description of the Hazardous Event	Human Health (Public Health)	Environmental Risks	Likelihood Almost certain - several times per year Likely - once every 1 - 3 years Possible - once every 3 - 10 years Unlikely - once every 20 years Rare - once every 100 years	Causes	Impact Insignificant Minor Moderate Major Catastrophic	Assessed Risk Low Moderate High Very High	Pre-emptive Actions – Existing Controls, Procedures, Operator Training, SWMS
STP									
1	**Sewage**	**Overflow at Inlet Pit/s**		✓	Unlikely	• Blockage of inlet pit inlet and outlet points - solids buildup due large debris/lack of cleaning of screening • Vandalism of inlet pits	Insignificant	Low	• Work Method - daily inspection & routine maintenance. • Operator Resourcing - at least one (1) operator onsite every day, if hazardous event occurs during "out of hours", two (2) operators "on-call" and response time is 1hour. • Control – three (3) inlet pits have been provided for distribution of sewage into Oxidation Pond No. 1. • Control - STP has a manproof fence and locked gate.
2	**Effluent**	**Overflow at Oxidation Ponds**		✓	Unlikely	• Channel/Pipe blockages. • Vandalism of inlet/outlet pits	Insignificant	Low	• Work Method - daily inspection & routine maintenance. • Operator Resourcing - at least one (1) operator onsite every day, if hazardous event occurs during "out of hours", two (2) operators "on-call" and response time is

									1hour. • Control – STP has a manproof fenced and locked gate.
3	**Effluent**	**Overflow at Maturation Ponds**		✓	Unlikely	• Channel/Pipe blockages. • Vandalism of inlet/outlet pits	Insignificant	Low	• Work Method - daily inspection & routine maintenance. • Operator Resourcing - at least one (1) operator onsite every day, if hazardous event occurs during "out of hours", two (2) operators "on-call" and response time is 1hour. • Control - STP has a manproof fence and locked gate.

Table 3.5: SPS Risk Register

	Contaminant	Description of the Hazardous Event	Human Health (Public Health)	Environmental Risks	Likelihood Almost certain - several times per year Likely - once every 1 - 3 years Possible- once every 3 - 10 years Unlikely - once every 20 years Rare - once every 100 years	Causes	Impact Insignificant Minor Moderate Major Catastrophic	Assessed Risk Low Moderate High Very High	Pre-emptive Actions (Existing Controls) In addition to Operator training, SWMS
SPS 1 – Merton St SPS									
1	**Sewage**	**Overflow**	✓	✓	Possible	• Power/pump failure • Vandalism	Minor	Moderate	• As per Item #A • Existing Control – 16 hours storage at ADWF* • Existing Control – Fenced off/gated PS site & locked.
SPS 2 –Warraweena St SPS									
2	**Sewage**	**Overflow**	✓	✓	Possible	• Power/pump failure • Vandalism	Minor	Moderate	• As per Item #A • Existing Control – 8 hours storage at ADWF* • Existing Control – Fenced off/gated PS site & locked.
SPS 3 –Becker St SPS									
3	**Sewage**	**Overflow**	✓	✓	Possible	• Power/pump failure • Vandalism	Minor	Moderate	• As per Item #A • Existing Control – 6 hours storage at ADWF* • Is this SPS fenced off ?
SPS 4 – Anson St SPS									

4	**Sewage**	**Overflow**	✓	✓	Possible	• Power/pump failure • Vandalism	Minor	Moderate	• As per Item #A • Existing Control – 4 hours storage at ADWF*
SPS 5 – Gorrell Ave SPS									
5	**Sewage**	**Overflow**	✓	✓	Possible	• Power/pump failure • Vandalism	Minor	Moderate	• As per Item #A • Existing Control – 48 hours storage at ADWF*
SPS 6 – Alice Edwards Village SPS									
6	**Sewage**	**Overflow**	✓	✓	Possible	• Power/pump failure • Vandalism	Minor	Moderate	• As per Item #A • Existing Control – 24 hours storage at ADWF*
SPS 7 – Renshaw (Showground)									
7	**Sewage**	**Overflow**	✓	✓	Possible	• Power/pump failure • Vandalism	Minor	Moderate	• As per Item #A • Existing Control – 48 hours storage at ADWF*

* Storage Times provided by Bourke Shire Council
Item #A – common pre-emptive actions:

- Existing Controls – Alarms for no flow, high flow , power failure
- Existing Controls – Installed standby pump
- Work Method – Periodic inspection & testing of electrics by electrical contractor
- Work Method – Daily inspection of PS and routine maintenance by operators
- Work Method – Sewer Incident Notification Protocol

3.2 Major Findings

From **Table 3.4** and **Table 3.5**

The health and environmental risks posed by identified hazardous events relating to the STP were all found to be LOW.

The health and environmental risks posed by identified hazardous events relating to the SPSs ranged from LOW to MODERATE.

4 Preventative Actions to be Undertaken

4.1 General

The preventative actions or measures to manage and minimise the risk to human health and the environment involve a multiple barrier approach. The multiple barriers, in order of preference, are as follows;

- Elimination;
- Substitution;
- Isolation;
- Engineering means;
- Administrative; and
- Personal Protection Equipment (PPE).

These are readily broken down to the following classification of management strategies:

- Appropriate design of the facilities;
- Appropriate operation and monitoring; and
- Appropriate education and training.

The identified current preventative actions are shown in this section.

4.2 Collection & Transport System

A summary of details for BSC six (6) Sewage Pump Stations (SPS) currently in operation, including some catchment pipeline details, is provided in **Table 4.1**.

The details contained in **Table 4.1** were obtained during the site visit, from STP Operators.

Collection system overflows can principally occur from five main causes. These are:

- Power/mechanical failure at pumping stations
- Reticulation system blockage/leakage
- Rising main breakage (leaks or major failure),
- Breakdown of pump units, and
- Excessive inflows

4.2.1 Reliable Power Supply

Council has reported that Bourke has a reliable power supply. Generally power outages in the Bourke area are not common. Power failures of extended duration are possible but are usually planned outages.

Generator connection points are installed at all SPS's and a generator, for use at SPS's, is stored at the Council Depot.

4.2.2 Provision of Emergency Storage

A sewerage system must have sufficient capacity to store sewage, which continues to flow from the catchment during extended mechanical breakdowns or electrical failures.

It is generally accepted, for towns in regional NSW, that at least 4 hours is the average time required for an operator/technician to respond to pumping or power failure.

According to the operators and their experience with the sewage pump stations

4.2.3 Response Times to Abnormal Operating Conditions

Response times are expected to be short as the operators live within/within a close distance of the town.

It is recommended that essential spare parts are stored at a central location such as Council Depot or STP.

4.2.4 Pumping and storage capacity

Pumping and storage capacity for each SPS is provided in **Table 4.1**.

4.2.5 Stand-by Pumps

All pump stations are equipped with automatic duty and standby pumps (100% standby) except for Renshaw SPS.

4.2.6 Telemetry System

Five (5) of the SPSs are connected via a telemetry system. The system has the capability of sending an SMS to the "on-call" should there be a power or pump system fault.

The SPS at Alice Edwards Village (SPS 6) has the ability to be connected to the telemetry system, however currently the SPS remains unconnected.

The Renshaw/racecourse SPS (SPS 7) does not have telemetry installed however is a very small PS with loads from one house and racecourse.

Should a fault arise at the two (2) non-telemetered pump stations, operators will discover the problems at SPSs from daily inspections or from the community.

Additionally, loads at the two non telemetered/connected pump stations are quite small, and do not pose an environmental risk.

4.2.7 Chemical Spills

There are no chemicals used for the scheme.

4.2.8 Risk Reduction

The likelihood of sewage/chemical overflows/spillages from SPSs and resulting environmental and health risks associated with sewage/chemical overflows/spillages is reduced by provision of the following "preventative measures":

1. Reliable power supply
2. Portable generators and generator connection point available
3. Greater than 4hours detention in upstream network
4. Adequate pumping capacity
5. Standby pumps
6. Telemetry system, to provide early warning of potential events: high level, pump failure, power failure
7. Site above 1 in 100 year flood level
8. SPS's not sited within close proximity of residences*
9. SPS's not sited within close proximity of drainage channels and waterways*
10. Overflow/bypass options to another SPS or treatment/containment of overflow

**The risk of an overflow from an SPS within close proximity of residences is considerably reduced through the installation of an overflow/bypass option.*

The likelihood of overflows from SPSs, and the environmental and health risks associated with overflows can be minimised by provision of the following "post overflow measures":

- Effective emergency plans/operational procedures for attending to failure and breakdown within the system effectively; and
- Short service response times i.e. response time less than detention time provided within the pumping station and upstream reticulation network, should power failure, pump failure or some other abnormal operating event occur.

A summary of "preventative" measures #1 to #10 listed above for each SPS is provided in **Table 4.1**.

Recommended risk minimising actions, to reduce the environmental and/or health risk presented by sewage overflows, generally comprised of applying one more of the following for each SPS:

- Elimination Actions
    - Assessing system hydraulics to determine trouble spots; 2004 Sewer Overflow Investigations Report (***Ref 1***) to be referenced
- Isolation/Engineering Means Actions
    - Installation of overflow/bypass options
- Administration Actions
    - Testing of any installed overflow/bypass options to ensure system will operate in an emergency scenario
    - Adherence to the Incident Notification Protocol.

4.2.9 Pump Station Details

Photo 4.1a –Warraweena St SPS (SPS 1)

Photo 4.1d –Warraweena St SPS (SPS 1)

Photo 4.1b –Warraweena St SPS (SPS 1)

Photo 4.2 – Mertin St SPS (SPS 2)

Photo 4.1c –Warraweena St SPS (SPS 1)

Photo 4.3 – Anson St SPS (SPS 4)

Photo 4.4 – Gorrell Ave SPS (SPS 5)

Photo 4.5b –Renshaw St SPS (SPS 7)

Photo 4.5a –Renshaw SPS (SPS 7)

Table 4.1 : Bourke SPS – Summary of Preventative Measures and Potential Risk Mitigation Measures

	SPS	SPS1 – Warraweena St	SPS2 –Mertin St	SPS3 – Becker St	SPS4 – Anson St	SPS5 – Gorrell Ave	SPS6 – Alice Edwards Village	SPS7 – Renshaw (Showground SPS)
A								
1	Reliable power supply ?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	source: STP Operator							
2	Generator and generator connection point available ?	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	source: STP Operator & Visual Inspection							
3	>4hrs detention ?	Yes	Yes	Yes	No - Surcharge in wet weather at a M/H upstream of SPS	Yes	Yes	yes
	Source: STP Operator							
4	Adequate pumping capacity ?	?	?	?	? RM to Mertin has the potential to block.	?	?	?
	source: STP Operator							
5	Standby pump installed ?	Yes	Yes	Yes	Yes	Yes	Yes	No – uninstalled standby available
	source: STP Operator							
6	Telemetry & alarms installed ?	Yes - high pit level, pump failure/telemetry system fault	Yes - high pit level, pump failure/telemetry system fault	Yes - high pit level, pump failure/telemetry system fault	Yes - high pit level, pump failure/telemetry system fault	Yes - high pit level, pump failure/telemetry system fault	No, not on telemetry, but does have capability. SPS not connected to telemetry system.	No – checked everyday, loads received only from racecourse and 1 house
	source: STP Operator							
7	Above 1 in100yr flood level/Within Town Levee	Yes	Yes	Yes	Yes	Yes	Yes	No
	source: Site Visit							
8	SPS Within 50m of Residences ?	Yes	Yes	Yes	Yes	Yes	Yes	No
	source: Google Maps & Site Visit							
9	Within 200m of Waterway ?	No	No	No	No	No	Yes	No
	source: Google Maps & Site Visit							
10	Overflow/bypass option	Yes (bypass completed end of 2012)	No	No	No	No	No	No
	source: STP Operator							
B	**Other Information**							
11	SPS Pumps to	Pumps to directly into Mertin St SPS well.	Pumps to the STP	Pumps directly into Warraweena SPS well.	Pumps into a M/H in Mertin St catchment.	Pumps into a M/H in Mertin St catchment.	Pumps directly to STP	Pumps into a M/H in Mertin St catchment.
12	No. of contributing sewer catchments	2	5	1	1	1	1	1
13	SPS Site Fenced	Yes	Yes	Yes	No	No	No	No
14	History of Overflow	Yes	No	No	No	No	No	No
C	**Assessed LIKELIHOOD of overflow**	Possible	Possible	Possible	Possible	Possible	Possible	Possible
D	**Assessed IMPACT of overflow**	Minor	Minor	Minor	Minor	Minor	Minor	Minor
E	**Overall RISK**	LOW	LOW	LOW	LOW	LOW	LOW	LOW
F	**Risk Mitigation Measures**		*Install overflow/bypass OR Establish protocol for dealing with*	*Install overflow/bypass OR Establish protocol for dealing with situation at*	*Install overflow/bypass OR Establish protocol for dealing with*	*Install overflow/bypass OR Establish protocol for dealing with situation*	*Install overflow/bypass OR Establish protocol for dealing with situation at*	*Install overflow/bypass OR Establish protocol for dealing with*

			situation at SPS2 *Follow Notification Protocol*	*SPS3* *Follow Notification Protocol*	*situation at SPS4* *Follow Notification Protocol*	*at SPS5* *Follow Notification Protocol*	*SPS6* *Follow Notification Protocol*	*situation at SPS6* *Follow Notification Protocol*

4.3 Sewage Treatment Plant (STP)

The ability of an STP to prevent and/or respond to pollution events is based on:

- Capacity (hydraulic and biological) to treat sewage to licence standards thereby preventing:
    - Overflows from individual process units/STP
    - Untreated/partially treated sewage being discharged
- Overflow/Bypass options installed to prevent loss of treatment process or isolation of problem area;
- Ability to contain chemical spills;
- Monitoring and control systems employed i.e. Telemetry and/or SCADA system preventing overflows/reduced impact of overflows as a result of
    - Electrical and/or mechanical failure;
    - Vandals/security breaches; and
    - Wet weather events.
- Required documentation in place i.e. Operational and Emergency protocols; and
- Operator's having appropriate and sufficient training

4.3.1 Sewage Treatment Capacity

The oxidation pond plant constructed in 1984 was designed for 5,000 EP. The population of the town has been progressively declining over the past 30 years and as such the plant is not likely to suffer from capacity problems in the foreseeable future.

Should an inlet pit become blocked, other inlet pits are available for distribution of raw sewage

The STP has no mechanical parts except for the effluent recirculation system. Effluent is recirculated with operator input i.e. physical installation of a stopboard in the effluent recirculation pit. Should a power or pump fault arise, an alarm will trigger a beacon. As the STP is visited daily by an operator, observation of the triggered beacon/mechanical equipment will result in necessary action.

Impact of overflow at effluent recirculation pit is minimal, as effluent would normally flow in to the adjacent evaporation area during times when effluent recirculation is not in operation.

Overflow from the ponds is not likely unless there is a blockage in inlet/outlet pits, for which the potential is minimised by daily site visits and maintenance

Protection of embankments and regular maintenance of vegetation i.e. weed growth assists in preventing embankment failure, and subsequently pond treatment capacity.

4.3.2 STP Details

Figure 4.6a – Inlet pit EP3 (in distance) at STP

Figure 4.6b – Inlet pit EP3 (in detail) at STP

Figure 4.7 – Inlet pit EP1 (in detail) at STP

Figure 4.8 – Effluent recirculation pump switchgear

Figure 4.9 – Effluent discharge pit and overflow pit (in background)

Figure 4.10 – Oxidation Pond No. 1 outlet

4.3.3 STP Chemical Spills

There are no chemicals stored onsite.

4.3.4 Monitoring & Control Systems

The STP does not have SCADA and remote monitoring capabilities. The mechanical equipment installed onsite comprises:

- Effluent recirculation system – failure of this system, should the stopboard be installed in the effluent recirculation well, will result in an overflow from the effluent recirculation pit, which poses minimal risk as effluent would normally flow through a pipe to the adjacent evaporation area.

4.3.5 Documentation

Documentation required onsite to assist with overflows and spillages comprise

- PIRMP (this document);
- Incident Notification Protocol (see **Appendix A**); and
- Sewer Overflow Form.

4.4 Summary

Over the years BSC been investing in the following engineering and administration tasks to reduce environmental and health risks posed by pollution events from Bourke Sewerage Scheme :

Engineering Means

- Renewal of sewer assets including:
    - Refurbishment of Waraweena SPS, completed in 2012
    - Construction of a new rising main to transfer sewage from Becker St SPS directly to Warraweena SPS, preventing surcharging of sewerage in the reticulation system.

Administrative

- Daily inspection of sewerage infrastructure
- Flow recording/Observation Log sheets for SPSs
- Sewer Incident Notification Protocol, created in 2004
- Record of Sewer Spills or Overflow

5 Inventory of Pollutants and MSDS

5.1 Inventory of Pollutants

The chemicals and pollutants used or generated as a result of operating the Bourke sewerage scheme comprise:

- Raw Sewage,
- Primary Effluent (effluent from Imhoff & PSTs),
- Secondary Effluent (effluent from Trickling Filters),
- Primary & Secondary Sludge, and
- Biosolids,

5.2 Inventory of Chemicals/Materials

At Sewage Pump Stations

- Nil.

At Sewage Treatment Plant

- Nil.

5.3 Inventory of Other Pollutants – Sewage and Effluent

The other potential pollutants are:

- Sewage (within the collection system and at head of the STP) –. All raw sewage is processed by the Oxidation Pond system.
- Effluent produced at the STP - 100% of the treated effluent is transferred to the adjacent evaporation area.
- Sludge produced at the STP: - The pond systems in regional NSW for small communities generally are desludged once every 10 to 15 years, sometimes 20 or more. In order for this to occur the pond is required to be taken offline, dried and the sludge/solids removed and disposed off at Council's landfill site.

Table 5.1 : Pollutant List – Sewage And Effluent

Parameter	Typical Raw Sewage	Required Effluent Quality
Biochemical oxygen demand (BOD_5)	110 to 350 mg/L[1]	<15 mg/L[3]
Suspended solids (SS)	250 to 300 mg/L[1]	<20 mg/L[3]
Total nitrogen (TN)	40 to 70 mg/L[1]	<15 mg/[3]
Ammonia	12 to 45 mg/L[1]	<1 mg/L[4]
Total phosphorus (TP)	4 to 12 mg/L[1]	<10 mg/L[3]
Oil and grease (O&G)*	50 to 100 mg/L[1]	<10 mg/L[3]
Faecal coliforms, FC	10^7 to 10^9 cfu/100 mL[2]	10^5 to 10^6 cfu/100 mL[2]
pH	6.5 - 8.5[1]	6.5 - 8.5[3]

1. Taken from Table 3-15 (***Ref 2***).
2. Taken from Table 12-13 (***Ref 2***).
3. EPA POEO licence requirements for wet weather river discharge (***Ref 1***)
4. Former EPA Sensitive Waters river discharge requirements

6 Safety Equipment

Safety equipment or other devices that are onsite will minimise the risks to human health or the environment and contain or control a pollution incident. These will include any personal protective equipment (PPE), material safety data sheets (MSDS), monitoring devices and spill containment equipment.

6.1 List of PPE Equipment Onsite

The following PPE safety equipment is provided onsite:

Table 6.1: List of PPE

Personal Protective Equipment	Location	Location
Hearing protection	STP	Operators Truck
Protective gloves	STP	Operators Truck
Dust mask	STP	Operators Truck
Safety glasses	STP	Operators Truck
Self contained breathing apparatus (SCBA)	STP	Operators Truck
Safety apron	STP	Operators Truck

6.2 List of Monitoring Devices

The sewerage system is monitored via a SCADA and telemetry systems. Alarms are automatically sent to operators via SMS

The following monitoring devices are present onsite:

Table 6.2: List of Monitoring Devices

System	Monitoring Devices	Devices Alert
SPS	No Flow Alarm	“on-call” STP Operator
	High Level Alarm	As above
	Power Failure	As above

7 Roles, Responsibilities and Contact Details

7.1 Stakeholder Responsibilities and Engagement

Council has committed to operating its STP and collection system in a responsible manner. Effective stakeholder engagement is necessary to fulfil this commitment. **Table 7.1** presents the stakeholders involved in the operation of the STP and collection system, sets out their roles, the communication expected to occur to achieve safe operation of the plant and collection system. Further information on the operation of the system and communication protocols is addressed later in this plan.

Table 7.1: Stakeholder Responsibilities and Engagement

Stakeholder	Responsibility
Bourke Shire Council (BSC)	• **Provision of safe and reliable water and sewerage services for Bourke Local Government area**
General Manager	• Reports to Council on engineering matters • In conjunction with Manger of Works, assesses risk to public safety should an incident posing health risk occur.
Manager of Works	• Reports to General Manager • Responsible for strategic planning and asset renewal • Responsible for management of water and sewerage operations and maintenance staff
STP Operators	• Report to Manager of Works • Performs routine tasks at STP and collection system components
NSW Health	• **Public health risk assessment and issues**
NSW EPA	• **Issuer of EPL** • **Policing of licence compliance and releases to water, air and land**
NOW	• **Assist Council with process treatment issues** • **Monitor compliance with licence** • **Plant inspections**
NSW Workcover	• **Work Health and Safety (WHS) issues**
Community of Bourke	• Advice where required during incidents such as odourous releases, pipeline and SPS overflows,
NSW Police/Fire & Rescue NSW (inc HAZMAT)/ Ambulance/SES)	• Response to incidents/emergencies (i.e. spills, injuries and accidents).

7.2 List of Contact Details

The contact details of the stakeholders are listed below in **Table 7.2**.

Table 7.2: Stakeholder Contact Details

Organisation	Position / Contact Person	Contact Details
Bourke Shire Council (BSC)	24 Hour emergency number	0419-248-402
	General	02 6847-6600
	Manager Works	0488-290-662

	Peter Brown	pbrown@Bourke.nsw.gov.au
NSW EPA – Dubbo Office	Pollution Line	131-555
	Brad Tanswell	02 6883 5330 (business hours) Brad.Tanswell@environment.nsw.gov.au
NSW Health - Far West Area Health Service Office	David Ferrall	08 8080 1333 (business hours) 0409-462-137 (after hours) DFerrall@gwahs.health.nsw.gov.au
NSW Office of Water (NOW) - Dubbo Office	Bruce Lamont	0458 268 453 (all hours) bruce.lamont@water.nsw.gov.au
Emergency Services	Police, Fire & Rescue NSW (HAZMAT), Ambulance	000

7.3 Council Procedures for Contacting Staff to Respond to a Possible Incident

All SPS and STP telemetry alarms are transmitted by SMS phone message to the two (2) “On Call” STP Operators.

The STP Operator will attend to an alarm and report to Manager of Works.

Any blockages reported within the sewage collection system are attended to by the Operators and cleared.

All works are undertaken to comply with the relevant:

- Sewer Incident Notification Protocol (see **Appendix A**)
- Record of Sewer Spills or Overflow (see **Appendix B**)

8 Communicating with Neighbours and the Community

8.1 Incident Classification

To determine the appropriate communication strategy for an incident, the incident or "*Impact*" needs to be categorised. Once categorised the prescribed communication strategy can be deployed.

Pollution incidents are currently managed via "Sewer Incident Notification Protocol" document (**Appendix A**). The procedures documented in the PIRMP are based on protocols detailed notification document and triggers are consistent with "*Impacts*" detailed in **Table 3.2.**

The following details the three classes of incidents.

MINOR Incident: managed by routine procedures/work practices.

- Area affected – small and localised
- Clean up – Easy and without additional assistance
- Waterway/Environment – Not Sensitive
- Risk of material harm to humans and/or environment – No

MODERATE Incident: further investigation may be required and assessment of management options over the short term. Operations and maintenance adjusted to reduce the consequences, likelihood and exposure.

- Area affected – more than one (1) property
- Clean up – Moderate and without additional assistance
- Waterway/Environment – Not Sensitive
- Risk of material harm to humans and/or environment – Yes

MAJOR Incident: further detailed investigation and assessment of management options is required; immediate review and adjustment of operations and maintenance to reduce the consequences, likelihood and exposure; clean-up and notification procedures become high priority.

- Area affected – a large number of properties
- Clean up – Substantial with additional assistance
- Waterway/Environment – Sensitive
- Risk of material harm to humans and/or environment – Yes

The following examples are shown;

MINOR Incident – incidents with a low risk to health and the environment such as;

- Reticulation system blockages.
- Short term power failure or electrical failure.
- Minor spills to the ground.
- Overflows/Spills at various STP process units

MODERATE Incident - an incident with a medium risk to health and the environment such as;

- Moderate flows/volume spills to the ground in sensitive/high human traffic areas
    - sensitive environment/waterway, particularly if upstream of WTP intake
    - in a public park or sporting field where significant usage for recreational activities is being undertaken.
    - inside the grounds of or in close proximity to a school or a child care centre.

MAJOR Incident - an incident with a high risk to health and the environment such as;

- Major flows/volume spills to the ground in sensitive/high human traffic areas
    - sensitive environment/waterway, particularly if upstream of WTP intake
    - in a public park or sporting field where significant usage for recreational activities is being undertaken.
    - inside the grounds of or in close proximity to a school or a child care centre.
- Extended power failure
- Extreme wet weather event
- Earthquake or structural collapse causing significant damage

8.2 Notification process

The following incident notification process will be undertaken for the identified incident levels;

MINOR Incident

- The STP Operator will report MINOR incidents to the Manager of Works ASAP and notify only surrounding affected neighbours for a small localised minor incident.
- The Manager Works to report to the General Manager quarterly.

MODERATE Incident – Notifiable

- The STP Operator will report MODERATE incidents to Manager of Works **IMMEDIATELY**.
- The Water and Waste Manager will report to the General Manager **IMMEDIATELY**.
    - If overflows occur - The Manager of Works will report HIGH or HIGH RISK incidences **IMMEDIATELY** to NSW Health and NSW EPA
    - If public affected call NSW Health.
- Manager of Works will notify affected Community and Media.
- Manager of Works will organise water quality sampling and testing program if required, by qualified and independent personnel.

MAJOR Incident - Notifiable

- The STP Operator will report MAJOR incidents to the Manager of Works and Emergency Services I**MMEDIATELY**.

- The Manager of Works will report to Emergency Services (if not previously contacted) **IMMEDIATELY**.
    - If overflows occur - The Manager of Works will report SIGNIFICANT OR HIGH RISK incidences **IMMEDIATELY** to NSW Health and NSW EPA and Council's General Manager.
    - If public affected, call NSW Health
- General Manager will notify affected Community post liaison with NSW Health and will also the Media.

This notification process is shown schematically in **Figure 8.1** and forms part of the operator training and awareness.

Incident reporting includes communicating the incident and also documenting the incident.

For Notifiable Incidents, notification will consist of:

- Ringing NSW EPA's Pollution Line of 131-555.
- Notification within of 48 hours of Council being aware of the overflow/bypass incident and provision (by fax or email) of completed "Record of Sewer Overflow" **Appendix B** report within a week after the incident to the following bodies:
    - NSW Health;
    - NSW EPA;
    - NSW Office of Water (NOW);
    - Council's Corporate and Community Services Section and
    - Council's Environmental Services Section.

Contact details are provided in the "Incident Notification Protocol" document in **Appendix A.**

8.2.1 Information to be collected

Information to be collected in the event of an overflow or bypass from the reticulation system, at a sewage pumping station or a sewage treatment plant will include but not be limited to:

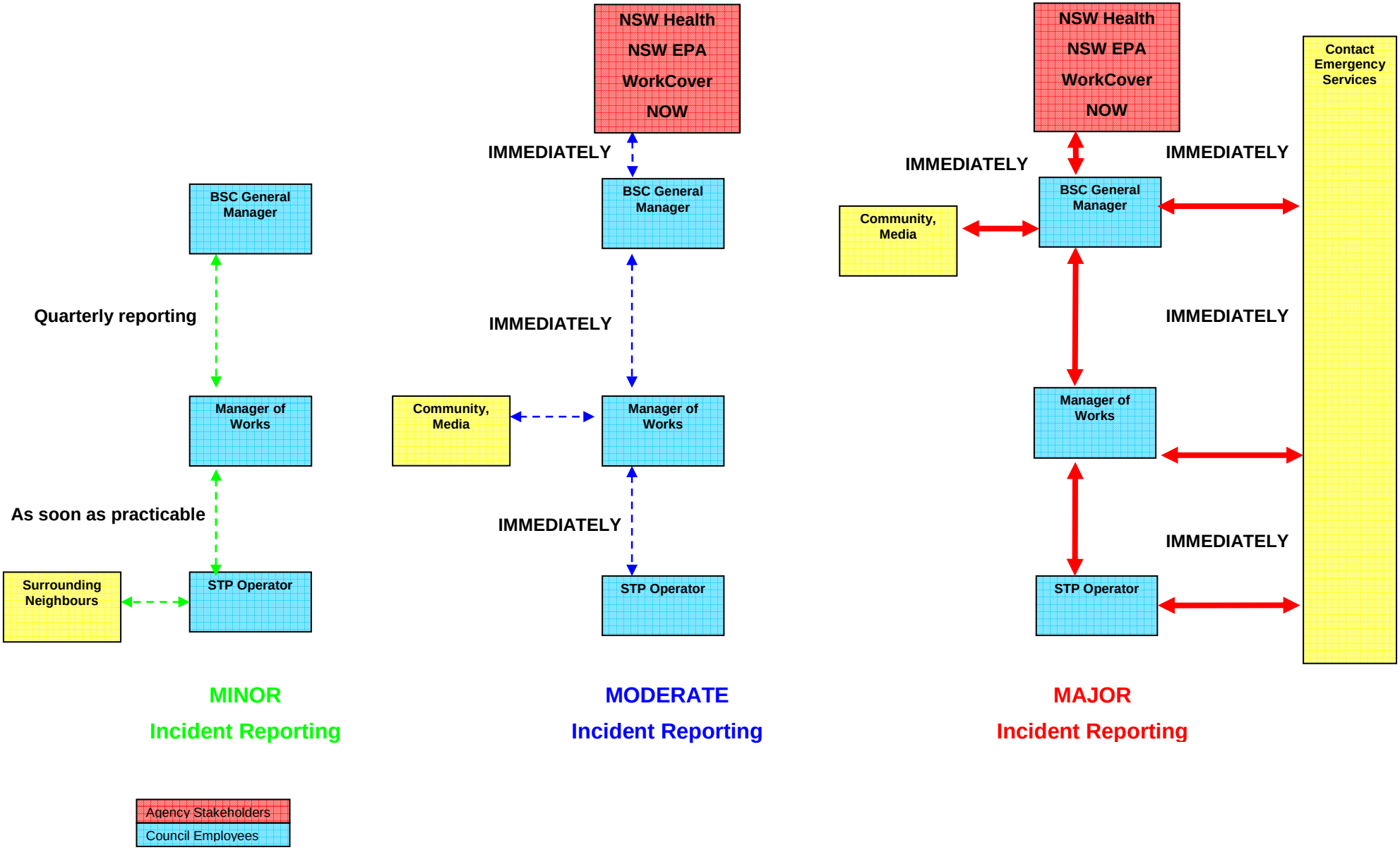
- The location of the overflow/bypass and a description of the receiving environment;
- Date ,estimated start time and duration of event;
- Volume of overflow/bypass;
- Classification of overflow/bypass due to dry (eg. power and mechanical equipment failure) and/or wet (ie. due to heavy rainfall) weather ;
- Probable cause of the overflow/bypass;
- Actions taken to stop overflow/bypass from occurring;
- Clean up activities undertaken; and
- Mitigating actions to prevent overflow/bypass from recurring.

8.3 Workplace Incidents

The following incidents and injuries must be reported to WorkCover:

- Notifiable incidents involving a fatality or a serious injury or illness.
- Notifiable incidents involving a fatality or serious injury or illness to other people at your workplace.
- Notifiable incidents that present a serious risk to health and safety at your workplace (dangerous incidents).
- Other incidents involving an injury or illness where workers compensation is payable.

Figure 8.1 : Incident Communication Protocols



8.4 Investigation of Incidents and Emergencies

Following any incident or emergency situation, including any “near misses” an investigation will be undertaken and all involved staff should be debriefed, to discuss performance and address any issues or concerns.

The investigation will consider factors such as:

- What was the initiating cause of the problem ?
- How was the problem first identified or recognised ?
- What were the most critical actions required?
- What communication problems arose and how were they addressed ?
- What were the immediate and longer term consequences ?
- How well did the protocol function ?

An incident reporting form for Muswellbrook is attached as **Appendix A**.

9 Minimising Harm to Persons on the Premises

9.1 Attendance Register

An attendance register (visitor's book) is in place at the WTP for all visitors and contractors to water infrastructure facilities including the sewerage assets.

9.2 Site Induction

Visitors are instructed to report to amenities building where they are inducted and sign a visitors book. All visitors are accompanied by a Council employee at all times.

Contractors are instructed by the relevant manager prior to visiting site. The contractors report to WTP amenities building where they are inducted, sign a visitors book and wear a "Visitors Tag" which is returned upon departure.

9.3 Evacuation Procedure

Evacuation safety procedure is part of the risk assessment procedure during induction onto any one of Council's sites.

9.4 Emergency Assembly Point

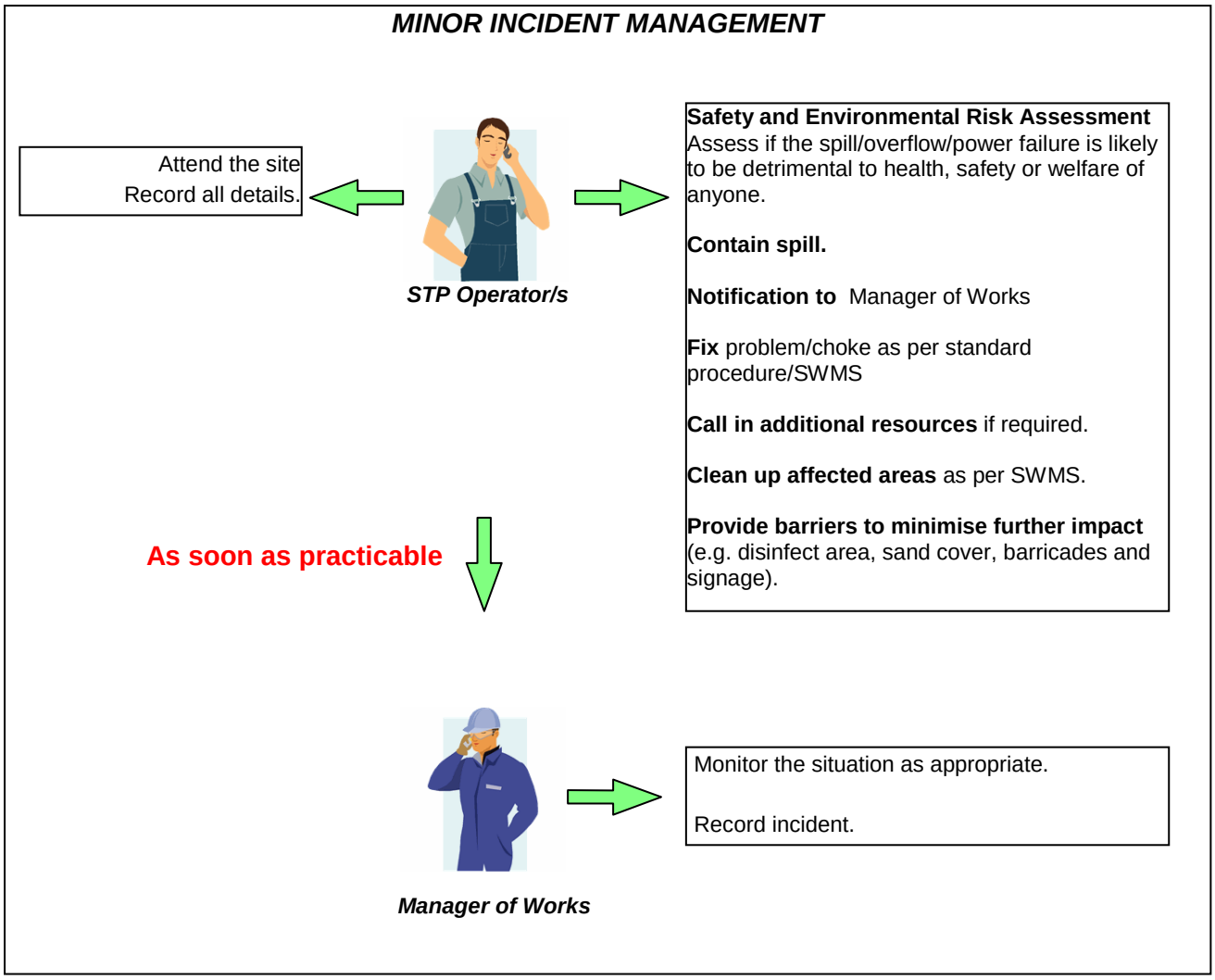
Corner of Wortermertie and Coomah streets

10 Actions to be Undertaken During or Immediately After a Pollution Incident

10.1 Minor Incident Action Plan (IAP)

The action plan for the following minor incidents is shown in **Figure 10.1**:

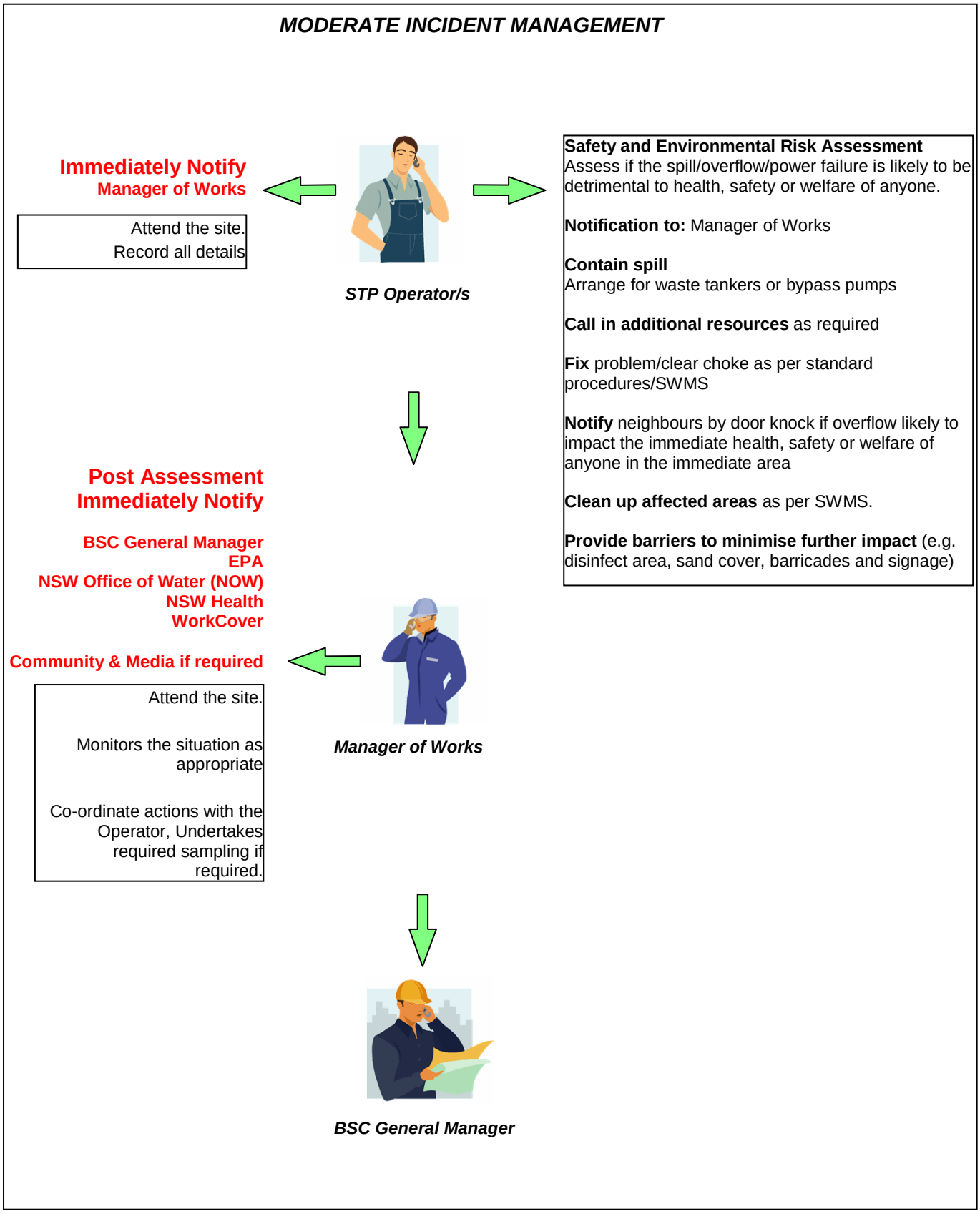
Figure 10.1 Minor Incident Action Plan



10.2 Moderate Incident Action Plan (IAP)

The action plan for the following moderate incidents is shown in **Figure 10.2** :

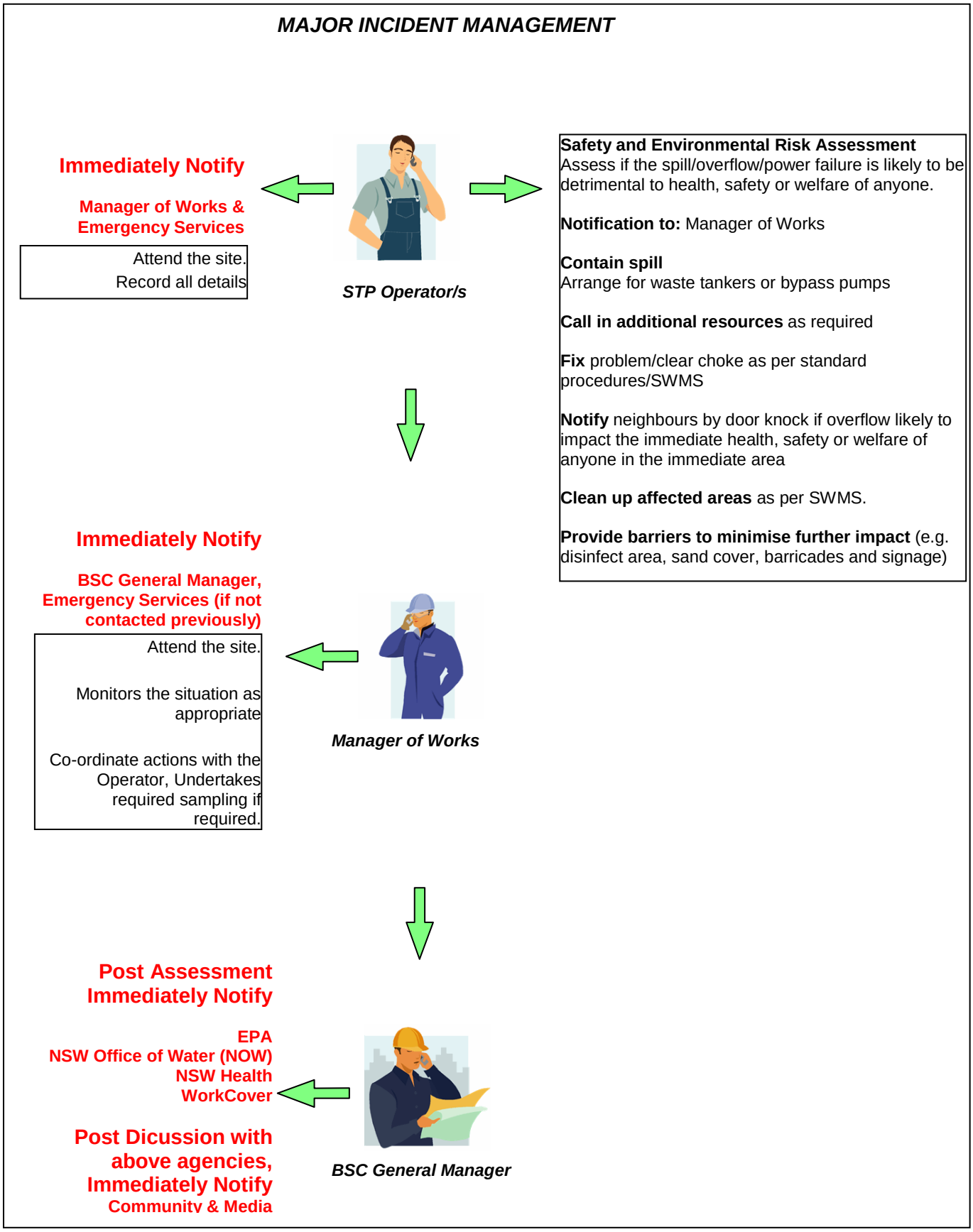
Figure 10.2 : Moderate Incident Action Plan (IAP)



10.3 Major Incident Action Plan (IAP)

The action plan for the following major incidents is shown in **Figure 10.3** :

Figure 10.3 : Major Incident Action Plan (IAP)



11 Staff Training

The water and wastewater group within Council comprises:

- Five (5) Water and Wastewater Operations staff –
    - One (1) operator has completed Part 1 of a Water Treatment Operator Course. None of the staff have received a Certificate III in Water & Wastewater Operations;
    - All operators have a Confined Space Entry Permit, this is part of Water AND Wastewater Operations job description;
- A Manager of Works – Received full operator training, and
- External contractors, as needed.

Staff have yearly review meetings where required training is identified over 1 year and 5 year period.

Resources are not currently available for all employees at WTP to attain a Certificate III in Water & Wastewater Operations.

Every staff member has a formal training record held by Council's HR department. A copy of training register for BSC Water & Wastewater Staff is contained in **Appendix C**.

Evaluation, Audit and Review for Continuous Development

11.1 Evaluation and Review

A systematic review of the plan will be undertaken by the Utilities Manager annually or within one month of an incident occurring at the plant. The evaluation will :

- Assess the relevance of the risk assessment against the current state of the plant
- Identify any emerging problems and trends
- Assess the communication between Council, Council operational staff and regulators
- Assist in determining priorities for improving procedures
- Assessment of incidents and responses determined
- Determine when and what is to be audited in the next six months

Evaluation of results described above will be documented and the plan updated.

Evaluation will be reported to the Council stakeholders.

11.2 Auditing

Auditing of the pollutant inventory is to be done annually.

An audit may also be triggered by a significant incident or if the process chemical is changed.

12 References

1. NSW Environment Protection Authority (EPA), "*Section 55 Protection of the Environment Operations Act 1997 Environment Protection Licence - 11570*",22nd May 2012, http://www.environment.nsw.gov.au/prpoeoapp/, (29th September 2012).
2. Metcalf & Eddy, Inc Tchobanoglous, G. Burton, F. Stensel, H.D. "Wastewater *Engineering: Treatment & Reuse 4th Edition*", New York: McGraw Hill, 2003
3. Public Works Department, *Bourke Sewage Treatment Works: Guidelines for Operation*, March 1987, Sydney

13 Appendices

Appendix A – Incident Notification Protocol

Appendix B – Record of Sewer Overflow

Appendix C – Training Register

Public Works

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