

**INCIDENT INVESTIGATION REPORT****Sentinel #:** INC-048163**Short title:** Minnivale Potential Asbestos Exposure**Date of incident:** September / October 2014**Time of incident:** N/A**Exact location of incident:** Minnivale Reservoir, Rabbit Proof Fence Road**Near Miss** ☐ (Tick box if applicable)**Injured Person(s) (IP)** ☒ (Tick box if applicable)**Injured Person Name(s):**☐ **Employee**☐ **Contractor**☐ **Member of Public****Nature of Injury sustained:**

While there is no confirmed exposure of individuals to asbestos, there is the potential for health impacts in the long term.

**Equipment/Property Damage** ☐ (Tick box if applicable)**Description/type of property or equipment:****Nature of damage:****Environmental Impact** ☒ (Tick box if applicable)**Description / type / extent of impact:**


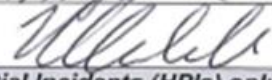
Asbestos containing material was disposed of without following asbestos disposal requirements.

**Short incident Description:**

On Thursday 8th October 2015 an environmental consultant arrived at the Minnivale Reservoir site to update the Asbestos Asset Register. A member of the project team and a contractor representative from the Minnivale Reservoir Refurbishment project were on site at the time. These representatives queried the work of the environmental consultant as throughout project design, planning and construction they had been advised that there were no Asbestos Containing Materials (ACM) on the site. The Asbestos Asset Register had been consulted in August 2013, and there was no entry for Minnivale Reservoir. However, the same environmental consultant had visited the Minnivale Reservoir site in September 2014, and taken samples which confirmed the presence of ACM. The Asbestos Asset Register was updated to reflect this in October 2014.

Construction works were undertaken between April and September 2015, and work methodologies had not factored in the presence of ACM. As a result of this interaction, the project team became aware that personnel attending the site during construction of the project were potentially exposed to asbestos through the grinding and handling of ACM.

**REVIEW AND SIGN-OFF:**

Sign-off	Name	Signature	Date
Lead Investigator	Karina Congdon		3/12/15
Branch Manager	Nick Churchill		3/12/15

Complete this section for **High Potential Incidents (HPIs)** only.

<b>General Manager</b> GM to sign off report to approve Corrective Action controls at administrative level or lower.	Mark Leathersich		3/12/15
<b>CEO</b> CEO to sign-off HPI event approving actions assigned at an organisational level.	Sue Murphy		3/12/15

**Have you adequately documented and/or attached:**

Required for Completed Investigation	Mark box with X
Investigation Team Members and Roles	<input checked="" type="checkbox"/>
Incident Overview	<input checked="" type="checkbox"/>
Timeline	<input checked="" type="checkbox"/>
Basic Cause of the Incident	<input checked="" type="checkbox"/>
Contributing Factors: <ul style="list-style-type: none"> <li>Absent/Failed Defences</li> <li>Individual/Team Actions</li> <li>Task/Environmental Conditions</li> <li>Organisational Factors</li> </ul>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
Corrective and Preventative Actions	<input checked="" type="checkbox"/>
Key Photographs/Sketches (Note: Primary ones here, others in <a href="#">Evidence Report - Minnivale Asbestos Exposure</a> )	<input checked="" type="checkbox"/>
Lead Investigator and RBM/Group Manager Sign-Off	<input type="checkbox"/>
Filed in Correct Aqua File for Region/Group	<input checked="" type="checkbox"/>
Notified <i>Senior OSH Analyst - Incident Management</i> that report is completed	<input type="checkbox"/>
Optional Attachments	Mark box with X
PEEPO Chart (Included in evidence report)	<input type="checkbox"/>

## 1 INVESTIGATION TEAM

Investigation Team Role	Position
Lead Investigator (LI)	A/Delivery Manager
Investigation Facilitator (IF)	Senior OSH Analyst Incidents
OSH Consultant	Team Leader Capital Works OSH Support
Subject Matter Expert (SME)	Senior OSH Consultant Occupational Hygiene
Branch Manager	Manager Project Management Branch
GM HPI Sponsor Rep	General Manager Asset Delivery Group
Safety Representative	Administration Manager

## 2 INCIDENT OVERVIEW

### 2.1 Background

Minnivale Reservoir is situated approximately 180 km North East of Perth. It is east of Dowerin on the Goldfields & Agricultural Water Supply “CK” main and 1 km north of the Goomalling-Wyalkatchem Road and Rabbit Proof Fence Road intersection (see Figure 1).

Operationally the Minnivale Reservoir is supplied potable water from the Cunderdin ‘A’ Pump Station, located upstream of reservoir. The water from the reservoir then gravitates to Minnivale Pump Station for transfer to downstream tanks and customers.

The reservoir has had a history of high leakage due to cracks in the existing 75 mm thick concrete lining and perished joint sealant. A structural review of the roof identified the existing roof purlins and bracing were severely corroded and the structure did not meet current design standards. A project was activated within the Goldfields and Agricultural Region in November 2008, to refurbish the reservoir. In 2013 the project was transferred to Project Management for delivery. The final scope of the refurbishment was to replace the roof structure, and install a liner on the base and sides of the reservoir. The refurbishment was completed on 30 September 2015.

During the project, the Asbestos Asset Register was consulted, and it was confirmed that there was no entry for Minnivale Reservoir (refer to timeline). The project team made numerous other queries which supported the assumption that there was no ACM on site, and the project proceeded on this basis.

The Asset Asbestos Register was updated on 10th October 2014, following a site inspection and sampling on the 11th September 2014.

On Thursday 8th October 2015, a member of the project team was on site with a representative of the Stage 2 contractor. An environmental consultant approached them and advised that they were on site to update the Asbestos Asset Register. This is when the project team and contractor first became aware of the presence of ACM on the Minnivale Reservoir site.

### 2.2 Construction

For the purposes of construction, the project was split into two stages. Stage 1 was constructed from 6 April 2015 to 1 July 2015 and included:

- Removal of the existing roof sheets and supporting structure and fascia panels;
- Supply and installation of the new roof support structure;
- Supply and installation of new roof and side panel sheeting; and
- Replacement of gutter joint sealant (external to the reservoir)

Stage 2 was constructed from 6 July 2015 to 30 September 2015 and included:

- Design, supply and installation of leak detection and under-drainage works;
- Preparation of all surfaces, including reservoir floor, walls and columns for the installation of the water proof lining system, including grinding concrete flat and removal of construction joint sealant; and
- Design, supply and install the water proof lining system.

A third contractor was engaged by the Water Corporation to carry out final cleaning and disinfection of the reservoir and to coordinate commissioning activities.

Work activities during the project where ACM was encountered were:

- Stage 1    Removal of fascia panels – these were unscrewed and manually removed.  
                 Grinding of the mastic (joint sealant) that was present in the concrete gutters.
- Stage 2    Grinding of the mastic used as a sealant between the concrete sections on the flooring to achieve a level finish.

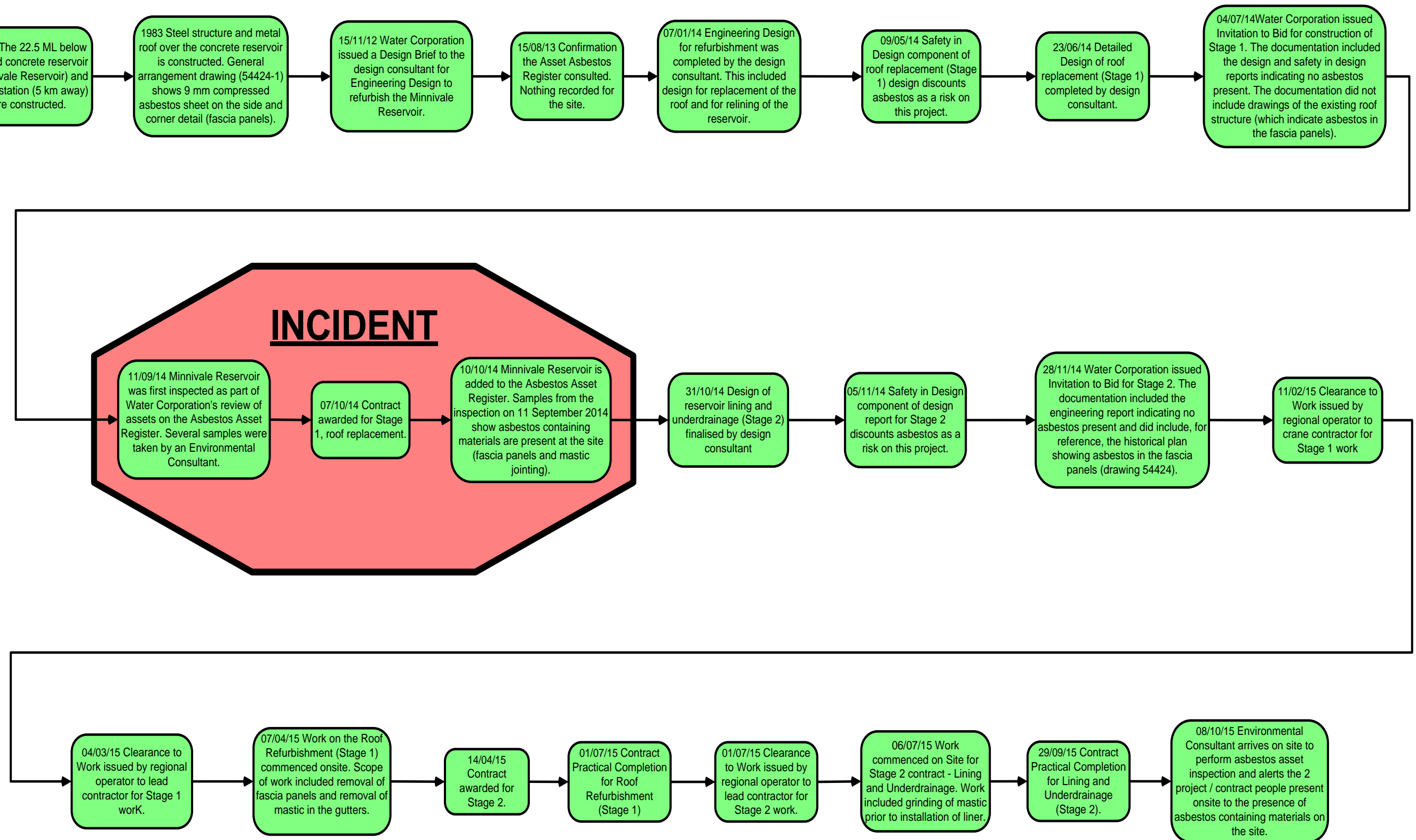
Figure 2 shows the reservoir in May 2010. The areas that are known to contain asbestos are highlighted.

## **2.3    Asbestos Asset Register**

The Asbestos Asset Register is used to list and risk assess Water Corporation assets known to contain asbestos. The register is part of an overall asbestos management plan which outlines methods for managing these assets.

Water Corporation has had some form of Asbestos Asset Register in place since 1996.

### 3 TIMELINE OF EVENTS



## **4 OUTCOME/CONSEQUENCE**

### **4.1 People**

Personnel attending the site during Stage 1 and 2 of the project construction were potentially exposed to asbestos fibres.

138 employees were inducted to the site between 1 April 2015 and 30 September 2015.

Not all of these employees were subject to the same level of risk, as only certain activities within the 6 month construction period involved removal of ACM. There are therefore less than 138 people who were onsite while work on ACM was under way.

Removal of the fascia panels was a 2 day activity early in the Stage 1 contract (April 2015), and witness statements note that the panels were in good condition.

Grinding the mastic has been assessed post the event as the higher risk activity and it is estimated that 7 workers were directly involved in this across the two contracts. They were not wearing the full Personal Protective Equipment (PPE) required for working with asbestos, however witness statements indicate that 4 workers were wearing respirators appropriate for asbestos removal and 3 workers were wearing disposable masks for some of the time.

Other workers in the vicinity of the grinding work were also potentially exposed, as were workers doing some of the clean-up activities such as sweeping.

### **4.2 Environment / disposal**

The method of disposal of asbestos can also give rise to risks through transport and ultimate containment. From the information gathered through the investigation, it can be established that the asbestos material from the Minnivale reservoir is contained. We are continuing to liaise with Department of Environmental Regulation regarding the transport and burial of the material and will take advice from them on any further action required.

#### *Fascia Panels*

In April 2015, the fascia panels were removed from the Minnivale Reservoir and placed in skip bins. They were transported to the Northam Landfill Facility, which is approximately 90km by road from Minnivale Reservoir (figure 1). The facility is licensed to receive asbestos.

As removal of the fascia panels was completed without knowledge of ACM on site, the panels were not wrapped for transportation.

The Northam Landfill Facility has advised the fascia panels were disposed of in a general waste area. There is no single area in the tip for asbestos placement and new designated areas are opened regularly depending on which areas of the general landfill are open and in use. The facility estimate the panels are now buried beneath 2-6 metres of landfill and will ultimately be up to 19 metres deep.

#### *Mastic and Concrete Dust*

The dust from removal of mastic sealant from the gutters during Stage 1 was collected using buckets and brooms, and disposed of in the skip bins. This would then have been transferred to the Northam Landfill either with the fascia panels or in a second skip used at the site.

The dust generated from grinding the mastic floor joint sealant during Stage 2 was mixed with concrete dust and garnet and was disposed as backfill material around the under-drainage monitoring pit located at the Minnivale site. The ACM backfill material is securely contained at a depth of approximately 3 metres below ground level with clean material placed above.

#### *Post Incident Testing*

On 29 October 2015, environmental consultants collected a further 34 samples from areas across the whole site. On the basis of the results and application of DoH and DER assessment criteria and guidelines, no unacceptable human health risks were identified at the Site or its surrounds during the investigation. Results indicate there is no asbestos from the Minnivale Reservoir refurbishment works in the surface soil on the site.

## **5 IMMEDIATE ACTIONS TAKEN**

Following the incident, an environmental consultant was engaged to test the reservoir site for the presence of asbestos. The consultant visited the site on Saturday 10 October 2015, and took two samples from the mastic sealant and two from dust around the inside of the structure. The samples from the mastic sealant confirmed the presence of chrysotile asbestos, or white asbestos. Asbestos was not detected in the samples taken from dust around the wall and roof structure, which would have been generated during the refurbishment project.

The key post-incident actions undertaken for the people impacted were:

- Identification of all people that attended the site between 1<sup>st</sup> April 2015 and 30<sup>th</sup> September 2015 and subsequent notification. This included internal notification of Water Corporation employees, as well as notification to the contracting companies.
- Conducting awareness sessions for those that attended site between the 1<sup>st</sup> April 2015 and 30<sup>th</sup> September 2015.
- Offering all people involved the opportunity to:
  - Record their exposure on the Water Corporation's Asbestos Exposure Register.
  - Access the Water Corporation's employee assistance program through PeopleSense (A PeopleSense councillor has attended all face to face awareness sessions held with the two contractors and their subcontractors)
  - Access long term health surveillance, including lung function testing

## **6 CAUSE OF INCIDENT**

### **6.1 BASIC CAUSE**

The Water Corporation had a record in its corporate systems of the presence of asbestos within the Minnivale Reservoir, but failed to inform contractors of this risk.

## 6.2 CONTRIBUTING FACTORS

*These are outcomes following conclusions gained from the completed ICAM Analysis. Please provide ICAM coding of contributing factor types where possible.*

ICAM ANALYSIS				
Organisational Factors	Task/Environment Conditions	Individual/Team Actions	Absent/Failed Defences	Incident
<p>Management Systems (MS)</p> <p>Lack of integration in the management systems for asbestos in assets in Water Corporation which did not trigger the AAR at multiple points</p>	<p>TE 2 – Hazard Analysis</p> <p>The presence of ACM was not identified on multiple occasions.</p>	<p>IT7 - Change management error</p> <p>The responsible person under Standard 131 Asbestos in the Workplace failed to review the AAR to identify and communicate any changes following the annual inspection on 11 September 2014.</p>	<p>DF6 - Detection Visual Warning Systems</p> <p>No warning signage on site warning stakeholders of the potential presence of ACM.</p>	<p>Failure to communicate the presence of ACM at Minnivale Reservoir prior to contractors commencing Stage 1 &amp; 2 works (between 11 September and 10 October 2014)</p>
<p>Organisation (OR)</p> <p>Inadequate governance and processes for asbestos management, including use of the Asbestos Asset Register. (Lack of designated role in the regions which is accountable for managing Asbestos Register and communicating change)</p>	<p>HF25 - Reliance on undocumented knowledge</p> <p>During the design phase ACM was not identified as there was reliance on information from the local operator that there was no ACM.</p>		<p>DF2 - Awareness Communication</p> <p>A failure to communicate the updated AAR to relevant parties.</p>	
<p>Management of Change (MC)</p> <p>There are no triggers to identify the need to install signage on site for assets that have been added to the AAR.</p>	<p>HF5 - Situational awareness</p> <p>Perception that asbestos would not be present in a mastic joint leading to use of inadequate tools for removal.</p>		<p>DF1 - Hazard Identification</p> <p>Failure to identify a requirement to transfer information indicating the presence of ACM in design drawings (Drawing No 54221 [1983 design drawing]).</p>	



ICAM ANALYSIS				
Organisational Factors	Task/Environment Conditions	Individual/Team Actions	Absent/Failed Defences	Incident
			<p>DF1 - Hazard Identification</p> <p>The Minnivale site was not identified on the AAR leading to a failure to include ACM as a risk in the Safety in Design report.</p>	
<p>Training (TR) &amp; Procedures (PR)</p> <p>The procedures for ACM management lack sufficient detail for works under contract and lead to a lack of knowledge and skills regarding identification and management of ACM, (e.g. Asbestos awareness training does not describe the full range of ACM - sealant would not be considered to have asbestos)</p>	<p>HF 25 - Reliance on undocumented knowledge</p> <p>During the design phase ACM was not identified as there was reliance on information from local sources.</p>		<p>DF5 - Awareness Work Instructions / Procedures</p> <p>At each stage of the project, no procedure actually stated the need to consult the asbestos register (SID, Project risk register, creation of contract, Start-up meeting agenda, Construction Risk Assessment Workshop, OSHMP desktop assessment, Clearance to Work)</p>	
<p>Contractor Management (CM)</p> <p>The process / procedures that ensure contractors are fully informed about hazards (e.g. ACM) are lacking in detail. (i.e. WC-OSH 024, S131 &amp; WC-OSH 023)</p>	<p>HF5 - Situational awareness</p> <p>Assumption that the asbestos register is complete – i.e. that if an asset is not on the register then there are no asbestos containing materials.</p>		<p>DF 4 - Awareness / Supervision</p> <p>Unclear responsibilities and accountabilities for ownership of asset inspection process and relevant management plans.</p>	

ICAM ANALYSIS				
Organisational Factors	Task/Environment Conditions	Individual/Team Actions	Absent/Failed Defences	Incident
			<p>DF2 - Awareness / Communication</p> <p>The HSE Handbook for Contractors does not include the need to identify and manage asbestos as referred to in S131.</p>	
			<p>DF3 - Competence / Knowledge</p> <p>Limited skills and knowledge in relation to identification and management of asbestos.</p>	
			<p>DF2 - Awareness / Communication</p> <p>The scope of works for asset inspection does not specifically require communication of major or critical changes in relation to ACM.</p>	

## **7 CONCLUSIONS AND OBSERVATIONS**

There are gaps in the Water Corporation's asbestos management process and project delivery process, and the two are not well integrated. There were several instances through the project that ACM should have been identified.

- On 10 October 2014, when the Minnivale Reservoir was added to the Water Corporation's Asbestos Asset Register (fascia panels and mastic joints) there was no formal process for advising the project team or Regional staff of that change.
- During the planning, design and construction phases of the refurbishment project, multiple opportunities arose for ACM to be identified on the site including:
  - The 1983 drawing that identified ACM in the fascia panel;
  - Site visits by project team, design consultant and bidders;
  - Verbal and written communications with the region; and
  - Contract documentation and construction start up meetings.

## 8 CORRECTIVE ACTIONS

	Org Factor code	Absent Failed Defence Code	Corrective Actions	Hazard Hierarchy Control Level	By Who	By When	Sentinel Action Number
<b>Region/Branch/District or Section Corrective Actions</b>							
1.	MC	DF6	Install asbestos warning signage at Minnivale Reservoir site and update register as required.	Administration	GAR Regional Manager	30 Oct 2015 <b>(Complete)</b>	
2.	PR TR	DF1 DF2 DF3	Discuss the key learnings with regional lead teams to raise awareness of which assets are on the register and document discussion completion dates.	Administration	GM Operations Group	15 Nov 2015 <b>(Complete)</b>	
3.	TR,	DF2 DF3	Communicate internally that assets not on the register may still contain asbestos (and include in the OSH Alert).	Administration	All Regional Managers, General Manager Asset Delivery Group	15 Nov 2015 <b>(Complete)</b>	
4.	MS TR	DF1 DF3	Modify the current prompt list on the Clearance to Work permit. Assess implementation and compliance as part of the contractor assurance activities. Ongoing monitoring to be verified through the Operational OSH Assurance Review program.	Administration	Manager SEA Branch	17 Dec 2015 <b>(Complete)</b>	
5.	MS OR	DF1	Perform a gap analysis between current local knowledge and existing asset asbestos register to determine priorities for inspection and update Asbestos Asset Register as required.	Administration	General Manager Operations Group	17 Dec 2015 <b>(Complete)</b>	

	Org Factor code	Absent Failed Defence Code	Corrective Actions	Hazard Hierarchy Control Level	By Who	By When	Sentinel Action Number
6.	TR PR	DF3	Prepare and issue an OSH Alert to communicate the findings, actions and key learnings arising from the event	Administration	Manager SEA Branch	9 Dec 2015 <b>(In progress)</b>	
<b>Group Corrective Actions</b>							
7.	OI MS	DF2	Review the project Asbestos Asset Register against the risk register for major works in progress to ensure they accurately reflect the latest version of the Asbestos Asset Register and update accordingly.	Administration	Manager Project Management Branch	6 Nov 2015 <b>(Complete)</b>	
8.	MS OR		Inspect works in progress (under construction) that are not identified on the Asbestos Asset Register to identify ACM and prioritise inspections based upon risk.	Administration	Manager Project Management Branch	31 Dec 2015 <b>(Complete)</b>	
9.	MS	DF6	Modify project management process to ensure appropriate signage is installed for asbestos encountered during projects and the asset owner is advised to include in the asbestos register.	Administration	Manager Project Management Branch	17 Dec 2015 <b>(Complete)</b>	
10.	MS	DF1 DF2 DF5	Modify the Safety in Design process and the Project Management process to explicitly reference the Asbestos Asset Registers to ensure that the most relevant information is available throughout the project lifecycle including granting of possession of site.	Administration	General Manager Asset Delivery Group	27 Nov 2015 <b>(Complete)</b>	
11.	MS	DF2	Revise and update the standard 'Special Conditions of Contract' to include specifications for the identification and management of Asbestos post possession of site, as interim whilst the Handbook for Contractors is being update with the same information.	Administration	Manager Contracts Branch	4 Dec 2015 <b>(Complete)</b>	
12.	IT7		Apply the performance and behaviour model to those involved in the incident	Administration	Manager Project Management Branch	31 Dec 2015 <b>(In progress)</b>	

	Org Factor code	Absent Failed Defenc e Code	Corrective Actions	Hazard Hierarchy Control Level	By Who	By When	Sentinel Action Number
<b>Organisational Corrective Actions</b>							
13.	OR MC	DF4 DS6	<p>Develop project management plan (Water Corporation Asbestos Management Project. Aqua Doc#13901266) to include:</p> <ul style="list-style-type: none"> <li>Auditing of all sites listed on the Asbestos Asset Register to verify if they contain ACM, determine specific location of asbestos and ensure sites are appropriately and clearly labelled.</li> <li>Inspecting all sites that are not on the register to verify presence or absence of ACM – to be prioritised based on asset type, age, risk, etc.</li> <li>Labelling all sites clearly as either containing asbestos, or not containing asbestos.</li> <li>Reviewing governance, processes and accountabilities for asbestos management.</li> <li>Reviewing current and auditing previous projects and activities of a similar nature to ensure correct processes were followed for asbestos management.</li> </ul>	Administration	Mgr Safety Environment & Aboriginal Affairs Branch	9 Nov 2015 <b>(Complete)</b>	Refer Corporate Asbestos Managem ent Project.
14.	OR MC	DS6	Implement the project management plan in accordance with the project milestones.	Administration	Mgr Safety Environment & Aboriginal Affairs Branch	<b>(In progress)</b>	
15.	TR PR		Simulate the work activity of grinding mastic containing asbestos to quantify the risk of exposure to people and communicate the outcome to affected parties.	Administration	Manager SEA Branch	10 Dec 2015 <b>(Complete)</b>	

## 9 KEY LEARNINGS

The Water Corporation knew of asbestos at the Minnivale site from the original 1983 drawings and from the 10 October 2014 update to the Asbestos Register. Despite having this information in its corporate systems the Water Corporation failed to inform contractors of the risks on the site.

Key learnings from this ICAM investigation are:

1. Be aware that the Asbestos Asset Register can never truly capture the asbestos risk on all Water Corporation assets;
2. When the Asbestos Asset Register is updated the management of change process must be followed;
3. It is important for the asbestos management process to be fully integrated with project management processes;
4. Assumptions underpinning the risk assessment for major projects need to be continually re-examined during all stages of a project lifecycle.
5. When working with dust and hazardous materials it is important to ensure that the correct and approved PPE is used at all times; and
6. Be aware that constructions mastics may be ACM or contain asbestos.

As a fundamental principle, the Water Corporation will assume that asbestos is present on all sites unless otherwise verified.

Figure 1 – Location Plan

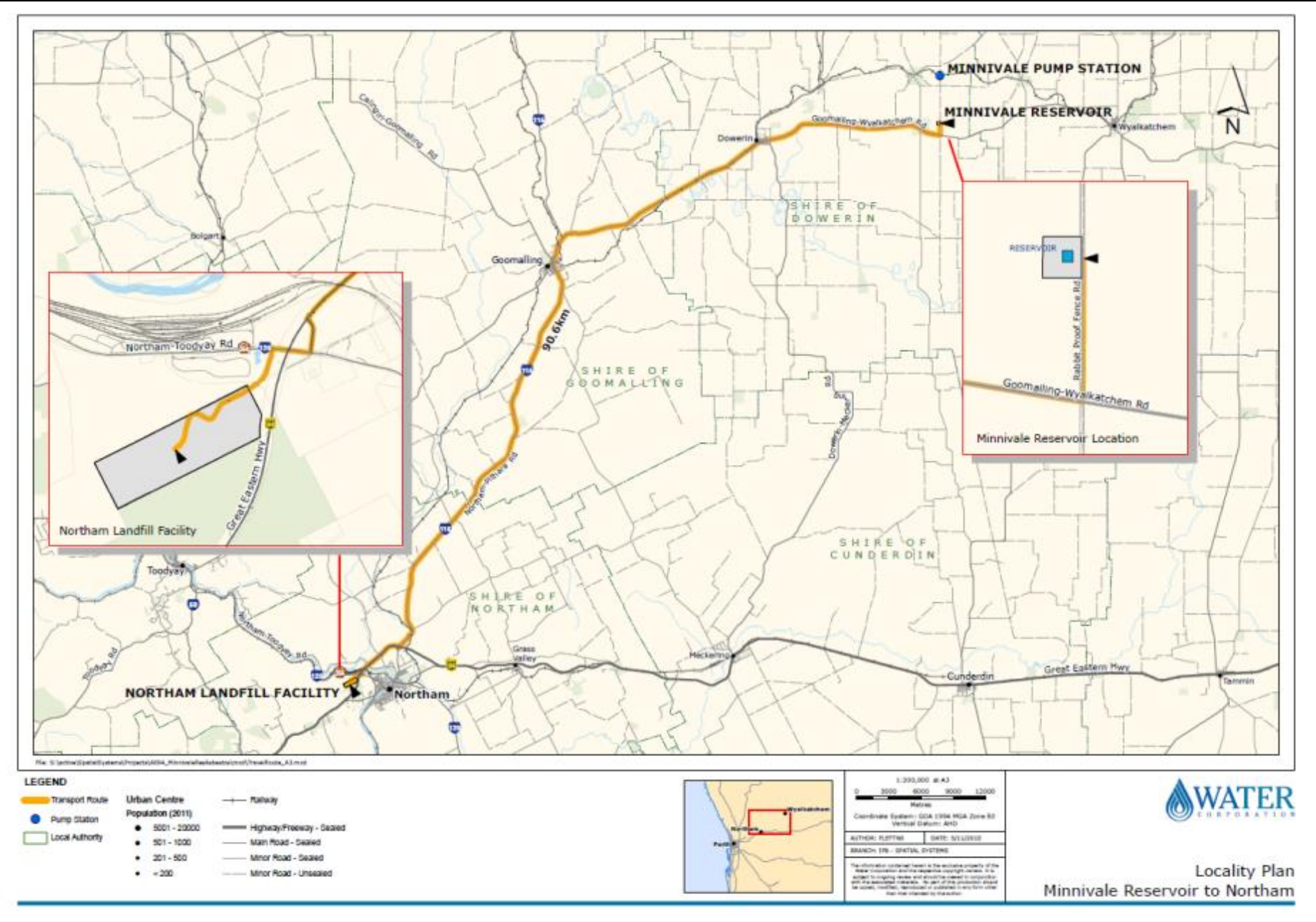




Figure 2 – Minnivale roof 2010 (prior to refurbishment)





Mr Richard Smith  
Project Manager  
Safety Environment & Aboriginal Affairs  
Water Corporation  
629 Newcastle Street Leederville WA 6007

Dear Richard,

**RE: Review of Minnivale Potential Asbestos Exposure Investigation Report (INC-048163)**

I refer to your request on 25th November 2015 and subsequent Terms of Reference for Safety Wise Solutions to provide an independent review of the above mentioned incident investigation report. This letter provides confirmation that this review has been completed and the details therein are outlined below.

On 27th November 2015 I met with two representatives from Water Corporation; Trevor Roffman and Karina Congdon; to discuss the report and identify specific areas for improvement. A particular focus of the review was to assess whether the proposed corrective actions address all the identified risks and are appropriately focused on risk reduction and incident prevention.

The following comments are provided against the Safety Wise Solutions incident report review criteria.

Report Section	Check Question	Comments
Identifying Information	Are the details of the time, place, date of the incident, people and equipment involved, clearly specified?	The report provided good identifying information and no changes were recommended.
Description of the Incident	Is the description of the incident clear, concise, logical and readable? Are only facts stated, not opinions?	The report provided a succinct and factual description of the incident in the section titled <i>Short Incident Description</i> . No changes were considered necessary.
Events leading up to the Incident	Is there enough background information on the work processes, people, equipment, environmental conditions, procedures and organisations involved to fully understand the situation prior to the event?	In general the report provided good background information and included photographs and supplementary documentation where appropriate. However, it was identified that the report would benefit from additional background information, some of which is contained in the document titled <i>Incident Review - Minnivale Reservoir</i> . Specifically, additional background information on the role and purpose of the Asbestos Asset Register (AAR) would be helpful.

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Report Section	Check Question	Comments
<b>Timeline</b>	Is there enough information presented in the timeline to fully understand the sequence of events? Is it logical?	A <i>Timeline of Events</i> table was provided but the format and layout of this table does not afford the reader to gain a visualisation of the relationship between events leading up to the incident, the activity surrounding the incident and events that occur immediately following the incident. It is recommended that the table be reformatted to more clearly identify the events Pre-Incident and those Post Incident. More specifically, the incident was not clearly defined and it is recommended that it be modified to the following: <i>Failure to communicate the presence of ACM at Minnivale Reservoir prior to contractors commencing Stage 1 &amp; 2 works (between 11 September and 10 October 2014)</i>
<b>Actual and potential consequences of the Incident</b>	Are the actual and potential consequences clearly stated and has the level of risk been identified?	There were no actual consequences identified in the report as the risk was identified as the potential exposure to ACM. The potential impact on people was well stated and generally thorough. However, it is recommended that some additional information contained in <i>Section 2.3 Asbestos Disposal</i> of the document titled <i>Incident Review - Minnivale Reservoir</i> be included around the potential risks to people from the removal of the fascia panels and cleanup process with mastic and concrete dust particles.
<b>Investigation Team</b>	Was the Team leader appointed as per Water Corporation Standards? Was there a competent facilitator? Was adequate technical expertise available on the team?	The makeup and composition of the investigation team was considered thorough and appropriate given the incident type.
<b>ICAM Analysis</b>		
<b>Basic Cause</b>	Does the basic cause describe the mechanism that caused the incident (where control was lost)	The basic cause was correctly defined in the report as: <i>The Water Corporation had a record in its corporate systems of the presence of asbestos within the Minnivale Reservoir, but failed to inform the Stage 1 and 2 contractors of this risk. Control was lost due to Water Corporation failing to communicate the potential presence of ACM prior to contractors commencing construction activities.</i>



Report Section	Check Question	Comments
<b>Absent and Failed Defences</b>	Do the listed items describe the equipment, work process, control measure, detection system, procedure or attribute which normally prevents this incident or limits the consequences?	<p>Some of the identified defences did not meet the criteria and were considered more appropriate as Organisational Factors or Task/Environment Conditions. It was also recommended that the report include the ICAM Contributing Factor Types for easier identification. The following defences were agreed based upon the evidence:</p> <p><i>DF6 Detection Visual Warning Systems: No warning signage on site warning stakeholders of the potential presence of ACM.</i></p> <p><i>DF2 Awareness Communication: A failure to communicate the updated AAR to relevant parties.</i></p> <p><i>DF1 Hazard Identification: Failure to identify a requirement to transfer information indicating the presence of ACM in design drawings (Drawing No 54221 [1983 design drawing]).</i></p> <p><i>DF1 Hazard Identification: The Minnivale site was not identified on the AAR leading to a failure to include ACM as a risk in the Safety in Design report.</i></p> <p><i>DF5 Awareness Work Instructions / Procedures: At each stage of the project, no procedure actually stated the need to consult the asbestos register (SID, Project risk register, creation of contract, Start-up meeting agenda, Construction Risk Assessment Workshop, OSHMP desktop assessment)</i></p> <p><i>DF 4 Awareness / Supervision: Unclear responsibilities and accountabilities for ownership of asset inspection process and relevant management plans.</i></p> <p><i>DF2 Awareness / Communication: The HSE Handbook for Contractors does not include the need to identify manage asbestos as referred to in S131.</i></p> <p><i>DF3 Competence / Knowledge: Limited skills and knowledge in relation to identification and management of asbestos.</i></p> <p>One additional failed defence was identified but required further clarification with stakeholders, namely:</p> <p><i>DF2 Awareness Communication: The scope of works for asset inspection does not specifically require communication of major or critical changes in relation to ACM.</i></p>
<b>Individual or Team Actions</b>	Do the listed items tell you about an error or violation of a standard or procedure made in the presence of a hazard?	<p>There were a number of Individual/Team Actions identified in the report that did not meet the ICAM criteria and were more appropriate as Organisational Factors or Task/Environment Conditions. It is recommended that these be removed and replaced with the only identified action:</p> <p><i>IT7 Change management error: The Asset Manager failed to review the AAR to identify and communicate any changes following the annual inspection on 11 September 2014.</i></p>
	Are they something that a person or persons did that directly led to the incident?	The original Individual/Team Actions identified in the report did not meet this requirement and it is recommended that they be removed.

Report Section	Check Question	Comments
Task or Environmental Conditions	Do the listed items describe something about the task demands, work environment, individual capabilities or human factors that promoted errors/violations or undermined the effectiveness of the system's defences?	<p>Some of the Task/Environment Conditions identified issues that were considered post incident and it was therefore recommended that they be included in key learning's. Specifically issues around the transportation and disposal of ACM and cleaning of dust without P2 respiratory protection.</p> <p>It is recommended that the following Task/Environment Conditions be included based upon them existing prior to the incident:</p> <p><i>TE 2 Hazard Analysis: The presence of ACM was not identified on multiple occasions.</i></p> <p><i>HF25 Reliance on undocumented knowledge: During the design phase ACM was not identified as there was reliance on information from the local operator that there was no ACM.</i></p> <p><i>HF5 Situational Awareness: Perception that asbestos would not be present in a mastic joint leading to use of inadequate tools for removal.</i></p> <p><i>HF5 Situational Awareness: Assumption that the asbestos register is complete – i.e. that if an asset is not on the register then there are no asbestos containing materials.</i></p>
Organisational Factors	Do the listed items identify a standard Organisational Factor present before the incident and which resulted in Task/Environmental Conditions or allowed those conditions to go undetected or unaddressed?	<p>There were a number of Organisational Factors identified in the report that were assigned multiple Organisational Factor Type (OFT) labels, making it unclear to specifically identify the organisational process that failed. It is recommended that the following Organisational Factors be included based upon the evidence:</p> <p><i>MS: Lack of integration in the management systems for asbestos in assets in Water Corporation which did not trigger the AAR at multiple points</i></p> <p><i>OR: Inadequate governance and processes for asbestos management, including use of the Asbestos Asset Register. (Lack of designated role in the regions which is accountable for managing Asbestos Register and communicating change)</i></p> <p><i>MC: There is no triggers to identify the need to install signage on site for assets that have been added to the AAR.</i></p> <p><i>TR &amp; PR: The procedures for ACM management lack sufficient detail for works under contract and lead to a lack of knowledge and skills regarding identification and management of ACM,</i></p> <p><i>CM: The process that ensures contractors are fully informed about hazards (e.g. ACM) are lacking in detail.</i></p>



Report Section	Check Question	Comments
Corrective actions	Do the corrective actions address all of the Absent/Failed Defences and Organisation Factors?	<p>The report included corrective actions that were all administrative in nature, although this is considered appropriate given that the incident was; 'the failure of Water Corporation to communicate'.</p> <p>It is recommended that a number of corrective actions be modified to meet the SMART requirement, specifically are able to be measured. Evidence that issues have been communicated/shared, procedures updated and registers modified should be noted.</p> <p>It is also recommended that the OFT's and Absent/Failed Defences contributing factor types are referenced against each corrective action to ensure that all identified risk issues are being addressed.</p> <p>Based on the above, it was determined that the corrective actions are appropriate for the risk issues identified and are focused on addressing all the identified OFT's and Absent/Failed Defences.</p>
Key Learning's	Are the key learning's appropriate?	<p>The key learning's provided in the report were not appropriately worded as learning's, but rather recommendations. An example of a key learning for this investigation would be: <i>Assumptions underpinning the risk assessment for major projects need to be continually re-examined during all stages of a project lifecycle.</i></p> <p>It is recommended that they be modified based upon the above. Additionally, some of the Task/Environment Conditions that were considered post incident should be included as key learning's.</p>

Based upon the above comments and recommendations, I believe that the report is thorough, evidence based and addresses all the identified risk issues. Furthermore, the steps outlined in the Asbestos Management Project is representative of a comprehensive approach by Water Corporation to ensure similar incidents in relation to potential exposure to ACM are minimised as far as is reasonable practicable.

If you wish to discuss any of the specific details of my review, please don't hesitate to contact me.

Kind regards



Dr Graham Edkins  
Manager Business Development