STEP-BY-STEP GUIDE

FOR CREATING STAKEHOLDER ENGAGEMENT PLANS FOR CONTAMINATED SITES IN NSW

Copyright

Disclaimer

The authors have used all due care and skill to ensure the material is accurate as at the date of this report and accept no liability for any errors or discrepancies in its contents.

INSTITUTE FOR SUSTAINABLE FUTURES
University of Technology Sydney
PO Box 123 Broadway, NSW, 2007
www.isf.edu.au

ACKNOWLEDGMENTS

This guidance document was developed with the assistance of the New South Wales Government through its Environmental Trust. The guidance document was developed:

- By a team led by Jason Prior of the Institute for Sustainable Futures, in collaboration with academics from the Institute for Sustainable Futures, including Irena Connon and Dena Fam and the Faculty of Health, including Jon Adams and Erica McIntyre at the University of Technology Sydney. The team from the University of Technology Sydney undertook a range of tasks during the course of developing the guidance document. These included: reviewing policy and practice literature; interviewing remediation engagement experts who have been involved in either developing or implementing stakeholder engagement plans; conducting focus groups, surveying and interviewing residents and other stakeholders involved in stakeholder engagement processes for contaminated sites and reviewing academic literature.
- With the ongoing support and guidance of a project reference group consisting of representatives of NSW Environment Protection Authority, including Arminda Ryan, Holly Love, Joanna Graham, Jen Byrne, Carolina Olmos; the Australasian Land and Groundwater Association, including Barbara Campany; the Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, including Bruce Kennedy; Bayside Council, including Judith Betts; and the Southern Sydney Regional Organisation of Councils, including Kate Hannan. The reference group provided guidance, advice and direction throughout the project and acted as a 'sounding board' for the ideas and approaches that were proposed.
- Through the contributions made by 3753 Australian residents, 2809 of whom lived near 15 contaminated sites across Australia. The sites were located in New South Wales, South Australia, the Australian Capital Territory, Tasmania, Queensland and Victoria. These residents participated in telephone surveys, interviews and focus groups.

TABLE OF CONTENTS

List of Tables

List of Figures

List of Casestudies

INTRODUCTION

IN THIS SECTION

INTRODUCTION

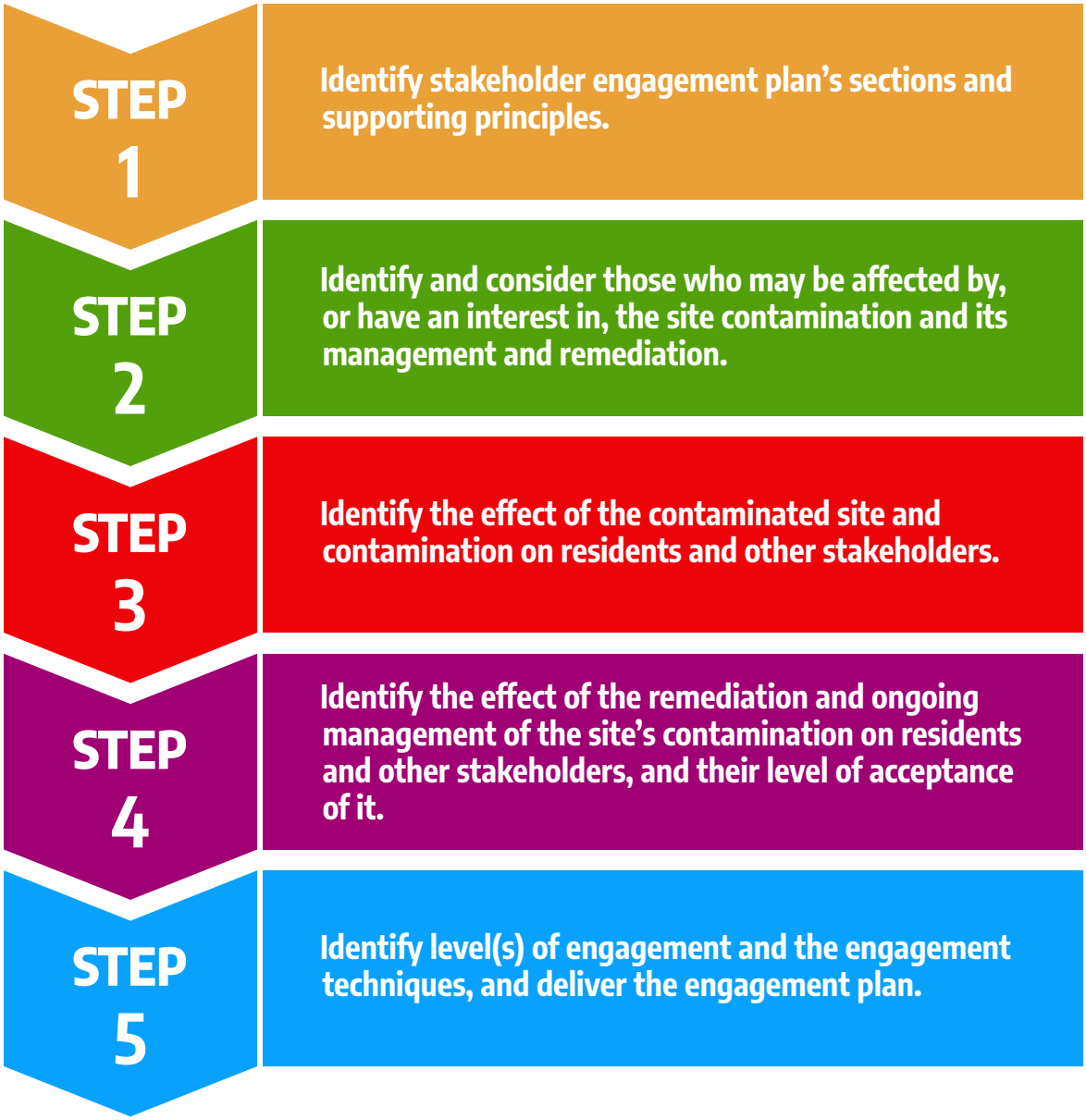
Background

There may be many people who are affected by, or interested in, a contaminated site. These stakeholders may include residents living near the site, landowners, officers from local government, or public health, environmental or other government regulatory authorities, and members of interest groups. In recent decades, the importance of engaging with these stakeholders has been recognised in a broad cross section of guidance that focus on the investigation, management and remediation of contaminated sites across Australia.[1] It has become common practice to develop a plan that assists with effectively engaging with those people who are affected by, or have an interested in, a contaminated site, and that specifies activities that will be implemented to manage or enhance engagement throughout the life of a contaminated site. A range of different terms may be used to describe these plans – for example, 'stakeholder engagement plan', 'community engagement plan', 'community consultation plan' or 'community relations plan'. Furthermore the terms 'stakeholder' or 'community' may be used interchangeably to refer to the target of the plan.[2] Regardless of the terminology used, the expectation is that the plan will enable engagement with all parties who are affected by, or have an interest in, a contaminated site and the investigation, remediation and management of that site.[3] This step-by-step guide uses the term 'stakeholder engagement plan' and provides information that can be used to construct such plans.

A stakeholder engagement plan is used to establish the objectives of the engagement program for a contaminated site, and to identify the individuals and groups that are affected by, or have an interest in, the site. A number of engagement techniques may need to be used within the plan to ensure the appropriate level of engagement with these stakeholders – from ensuring that local residents are kept up-to-date about work occurring on a site, to running workshops that involve relevant parties in decision-making around remediation objectives and options.

Purpose of step-by-step guide

The purpose of this document is to provide clear step-by-step guidance on how to create a stakeholder engagement plan for a contaminated site within New South Wales (NSW). The steps outlined in the guide include:



Whilst the primary purpose of this document is to provide step-by-step guidance on how to create a stakeholder engagement plan, consent authorities can also use it to: provide advice on how to compile a stakeholder engagement plan, or provide feedback on stakeholder engagement plans.

The value of stakeholder engagement planning

When planned well, stakeholder engagement can benefit all aspects of a contaminated site's investigation, remediation and ongoing management by helping to:

- understand stakeholder perceptions and concerns and more accurately anticipate stakeholder responses to actions and decisions
- increase the effectiveness of risk management decisions through stakeholder engagement
- improve communication, dialogue and trust and reduce unwarranted tension between stakeholders and decision-makers
- explain risk more effectively to ensure that stakeholders gain an accurate understanding of the risks.[4]

Furthermore, well planned stakeholder engagement ensures that there is an appropriate allocation of resources to engagement and communication efforts.[5]

Effective stakeholder engagement planning increases the opportunities for industry to benefit both during and after the investigation, remediation and management of a site. The benefits can include:

- less resistance to appropriate proposals
- better decision-making and sustainable outcomes – stakeholders, through their local knowledge, can offer new perspectives and solutions for issues, which may result in financial savings
- relationship/partnership development
- increased openness and trust
- demonstrated commitment to accountability and transparency
- shared understanding of problems and dilemmas
- wider community pride in organisations that work collaboratively with stakeholders[6]
- significant cost savings and greater credibility for organisations involved in contaminated site management.[7]

Risks of not effectively planning stakeholder engagement can include:

- delays for a project, which can create a need for additional investigations or engagement and increases to the project cost
- stakeholder outrage
- media scrutiny
- damage to a company's reputation and ability to conduct business
- potential litigation.[8]

Evidence-base, guidelines and legislation that informed the step-by-step guide

This step-by-step guide aligns with existing guidelines[9] and legislation[10] that are relevant to contaminated sites within NSW, and draws on an evidence-based understanding of how residents perceive and experience contaminated sites, their management and their remediation in the Australian context.[11]

How to use the step-by-step guide

After providing an overview of the evidence base, and of the guidelines and legislation that were used to construct the step-by-step guide, this document presents the step-by-step guide for developing a stakeholder engagement plan for a contaminated site in NSW. The document concludes with a glossary which defines some of the terms used throughout the step-by-step guide.

The step-by-step guide is made up of the following key components: 5 steps, 14 key questions, 14 checklists and a coding system. Figure 1 provides an overview of the relationships between these key components.

- **Steps:** We recommend that the user begin with Step 1. The checklist in Step 1 provides the user with an understanding of the different sections of a stakeholder engagement plan, and the 13 checklists within Steps 2, 3, 4 and 5 of this guide can be used to develop different sections of the plan.

- **Checklists structured around key questions:** Each of the 14 checklists within the step-by-step guide relates to one of 14 key questions that need to be addressed when developing the stakeholder engagement plan. For example, "Checklist E2" in Step 5 is designed to assist the user when addressing the key question "Does the plan consider how the engagement techniques will be delivered?"

- **Evidence, guidance and associated questions within each checklist:** Each checklist follows a similar structure. Within each checklist evidence, guidance and associated questions are grouped together to help the user to address that checklist's key question and identify information that can be used to complete the different sections of the stakeholder engagement plan outlined in Step 1.

  Where necessary, the information in each checklist is supplemented with case studies, tables and figures. These case studies, tables and figures are located as close as possible to the relevant checklist, usually immediately after the checklist.

- **Coding system within the checklists:** As explained in Figure 1, an intuitive coding system has been used throughout the 14 checklists. This coding system has been included to:

  - provide cross referencing within the guide that enables the user to understand how parts of the checklists in steps 2, 3, 4 and 5 can be used to complete the different sections of the stakeholder engagement plan outlined in Step 1
  - enable the user to reference different parts of the guide in their stakeholder engagement plan
  - enable the user to provide advice to someone who is creating a stakeholder engagement plan. If you are providing advice on a plan, it is advisable to speak with the person who will be the recipient of the advice when you have a reasonable idea about what your advice will include.

When approaching this step-by-step guide, a distinction should be made between first-time users and those with more experience. This recognises that although first-time users may benefit from going through each of the checklists in each step 'from cover-to-cover', more experienced users will be able to move directly to the checklists that are most relevant to them. We acknowledge that user experience and knowledge will influence greatly how the step-by-step guide will be used. For example, if an experienced user is creating a stakeholder engagement plan focused only on the investigation phase of a contaminated site, they may choose to ignore Step 4 which focuses on remediation and ongoing management.

Figure 1. Flow diagram of the step-by-step guide

Before proceeding to the five steps within the guide, we recommend that the first-time user read an overview of the evidence-base, and guidance and legislation that was used to construct the step-by-step guide. This overview is provided immediately after this figure. Topics covered include an evidence-based understanding of the relationship between residents and contaminated sites, and an overview of existing guidelines and legislation that inform stakeholder engagement planning for a contaminated site in NSW. This evidence-base, guidance and legislation has been incorporated into the step-by-step guide.

STEPS	CHECKLISTS STRUCTURED AROUND KEY QUESTIONS	CODING SYSTEM WITHIN THE CHECKLISTS
STEP 1 We recommend that the user begin with the checklist in step 1. The checklist in step 1 provides the user with an understanding of the different sections of a stakeholder engagement plan, and provides cross referencing to checklists in steps 2, 3, 4 and 5 that can be used to complete the different sections of the stakeholder engagement plan. The checklist within step 1 also provides the user with an understanding of the principles that guide each section of the plan.	Step 1 contains one checklist which helps the user address one key question: **Checklist P1 ➨ What are the stakeholder engagement plan's sections and supporting principles?**	The letter "**P**" is used to distinguish the checklists in Step 1, and is a reference to the step's focus on the **P**lan's sections and **P**rinciples that guide each section of the plan.
STEP 2 The checklists in Step 2 help the user to identify the plan's stakeholders.	Step 2 contains four checklists which help the user address four key questions: **Checklist S1 ➨ Does the plan identify and consider residents and landowners who are affected by, or have an interest in, the site contamination and its management and remediation?** **Case Study 1 – Homebush Bay Olympic Park** **Checklist S2 ➨ Does the plan identify and consider groups, organisations or other entities, ranging from local interest groups through to government agencies, that are affected by, or have an interest in, the site contamination and its management and remediation?** **Checklist S3 ➨** Does the plan identify and consider residents and other stakeholders from culturally and linguistically diverse (CALD) backgrounds, including indigenous people, who are affected by, or have an interest in the site contamination and its management and remediation? **Checklist S4 ➨** Does the plan identify and consider residents and other stakeholders who are living with chronic illness or disability who are affected by, or have an interest in, the site contamination and its management and remediation? **Case Study 2 – Rhodes Peninsula**	The letter "**S**" is used to distinguish the checklists in Step 2, and is a reference to the step's focus on **S**takeholders.

STEP 3

The checklists in Step 3 help the user to develop the plan by identifying the effect of the contaminated site and contamination on residents and other stakeholders

Step 3 contains three checklists which help the user address three key questions:

Checklist C1 ➡ Does the plan consider engagement during the investigation of the site's contamination, and the role of residents and other stakeholders during the investigation stage?

Checklist C2 ➡ Does the plan consider the effect of the contaminated site on residents and other stakeholders?

Case Study 3 – Hunters Hill & Neutral Bay

Checklist C3 ➡ Does the plan consider the effect of the contaminant on residents and other stakeholders?

The letter "**C**" is used to distinguish the checklists in Step 3, and is a reference to the step's focus on the **C**ontamination and **C**ontaminated site.

STEP 4

The checklists in Step 4 help the user to develop the plan by identifying the effect of the remediation and ongoing management of the site's contamination on residents and other stakeholders, and their acceptance of it

Step 4 contains three checklists which help the user address three key questions:

Checklist R1 ➡ Does the plan consider the different stages of the remediation and ongoing management of the contamination at the site, and does it consider the roles of residents and other stakeholders at different stages?

Case Study 4 - Leichhardt

Checklist R2 ➡ Does the plan consider the impact of the remediation and ongoing management options on residents and other stakeholders?

Checklist R3 ➡ Does the plan consider how residents and other stakeholders perceive the risk and benefits of remediation options, and their level of acceptance of these options?

Case Study 5 – Cabarita

The letter "**R**" is used to distinguish the checklists in Step 4, and is a reference to the step's focus on the **R**emediation and ongoing management.

STEP 5

The checklists in Step 5 help the user to identify level(s) of engagement and engagement techniques for the plan, and how the plan will be delivered

Step 5 contains three checklists which help the user address three key questions:

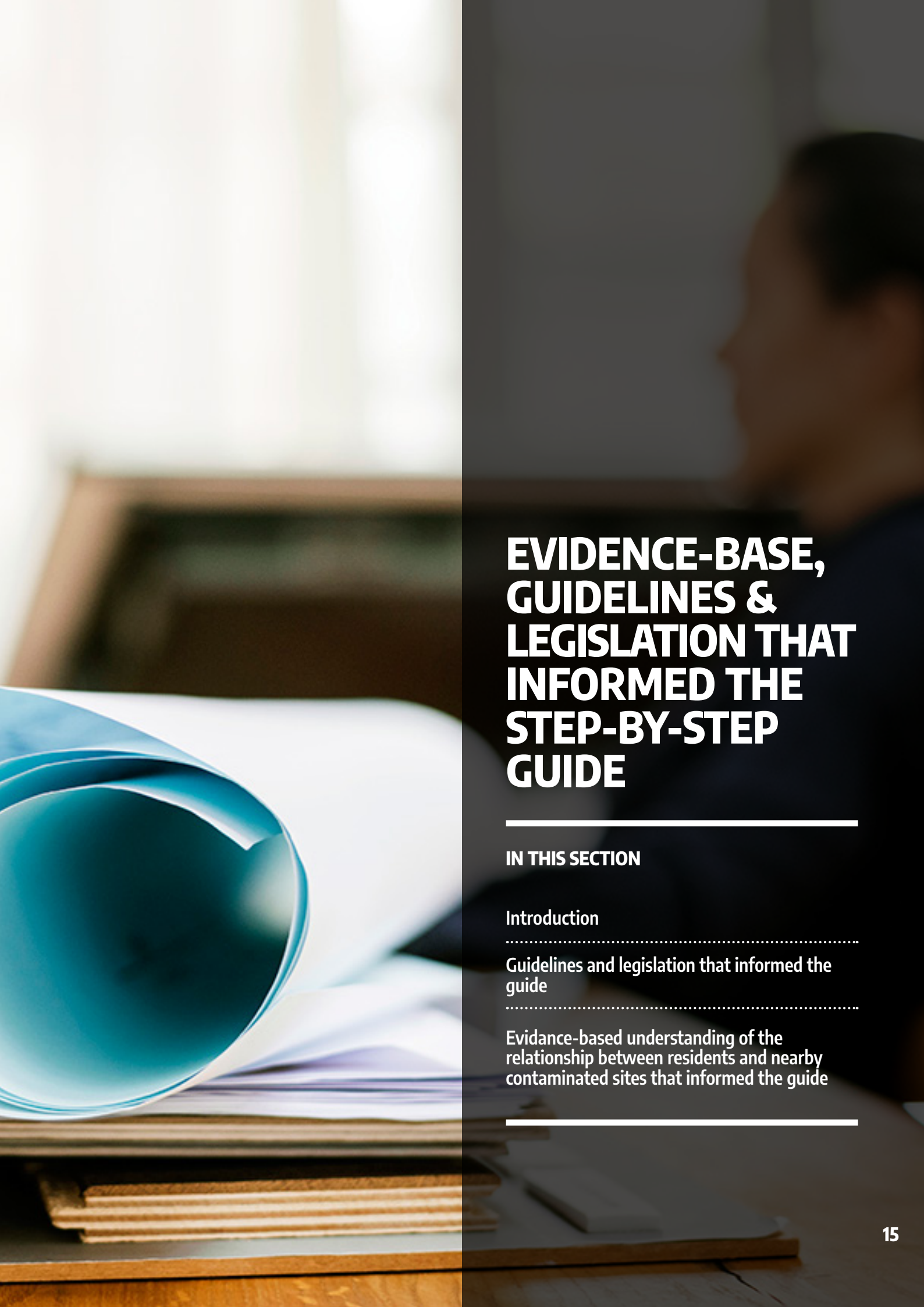
Checklist E1 ➡ Does the plan identify the level(s) of engagement and the engagement techniques that will be used to deliver the plan, and the resources needed to support the plan's delivery?

Checklist E2 ➡ Does the plan consider how the engagement techniques will be delivered?

Checklist E2 ➡ Does the plan consider the need for reporting, updating and ongoing evaluation?

Case Study 6 – Botany

The letter "**E**" is used to distinguish the checklists in Step 5, and is a reference to the step's focus on level(s) of **E**ngagement and **E**ngagement techniques.



EVIDENCE-BASE, GUIDELINES & LEGISLATION THAT INFORMED THE STEP-BY-STEP GUIDE

IN THIS SECTION

EVIDENCE BASE, GUIDELINES AND LEGISLATION THAT INFORMED THE STEP-BY-STEP GUIDE

➨ Introduction

The step-by-step guide aligns with existing guidelines[12] and legislation[13] that are relevant to contaminated sites within NSW and draws on an evidence-based understanding of how residents perceive and experience contaminated sites, their management and their remediation in the Australian context.[14]

➨ Guidelines and legislation that informed the guide

Stakeholder engagement planning for contaminated sites in NSW is driven by evolving guidelines and legislation at both the state and national levels within Australia.[15] This evolving guidance has been used to develop this step-by-step guide.

Various existing guidelines at the national level highlight that it is important to engage stakeholders throughout the assessment, remediation and management of a contaminated site. A guideline for engaging stakeholders at the time a site is being assessed for contamination is available through the National Environment Protection (Assessment of Site Contamination) Measure 1999 as amended (NEPM), in ***Schedule B (8), Guideline on community engagement and risk communication.***[16] The recently developed National Remediation Framework (NRF), specifically the ***'Remediation and management of contaminated sites guideline for stakeholder engagement'***[17] and ***'Identifying and Selecting Remediation Options'***[18] has extended stakeholder engagement guidance to the time that a site is undergoing the development and implementation of remediation and management processes. The guidance in this document builds on the guidance offered in the NEPM and the NRF. Where relevant and appropriate, the material contained in the NEPM and NRF has been adapted for use in this step-by-step guide.

NSW has its own guidelines and legislation that are related to the assessment, remediation and management of contaminated sites. These NSW guidelines and legislation provide minimal guidance on the requirements regarding the engagement of stakeholders during the assessment, remediation and management of a contaminated site.[19] The reason for this is that the NSW Environment Protection Authority, along with others involved with contaminated land in NSW, have traditionally deferred to the NEPM guidance, and the more recent NRF guidance, on stakeholder engagement. This guide was developed in line with the NSW guidelines and legislation that relate to the assessment, remediation and management of contaminated sites, and references within those documents to stakeholder engagement. These NSW-specific guidelines and legislation include: the ***Contaminated Land Management Act 1997 (NSW)***[20] ***State Environmental Planning Policy No 55: Remediation of Land (NSW)***[21], the ***Contaminated Land Management Regulation 2013 (NSW)***[22], the ***Protection of the Environment Operations Act 1997 (NSW)***[23], and the ***Environmental Planning and Assessment Act 1979 (NSW).***[24]

Other information used in the development of this guide includes a range of material, both generic and environmentally-specific, that provides guidance on stakeholder engagement. This includes the Environmental Health Risk Assessment: ***Guidelines for Assessing Human Health Risks from Environmental Hazards***[25] and ***A Framework for Assessing the Sustainability of Soil and Groundwater Remediation.***[26] In some instances material in this guide has been drawn verbatim, from these policy and guidance documents. This reflects the fact that one of the objectives of this guide is to harmonise with the existing policies and guidance.

➨ Evidence-based understanding of the relationship between residents and nearby contaminated sites that informed the guide

This step-by-step guide builds on an evidence base of how residents living near contaminated sites perceive and experience the contamination associated with those sites, and the remediation options that might be used at those sites. The evidence base used to construct the guide has been internationally peer reviewed, and is drawn from a detailed study of the perceptions of different contaminants, and remediation options, expressed by 3753 Australian residents, 2809 of whom lived near 15 contaminated sites across Australia. The sites were in New South Wales, South Australia, the Australian Capital Territory, Tasmania, Queensland and Victoria. The 15 sites had a range of recognised environmental contaminants present, including chlorinated solvents, hydrocarbons, heavy metals, asbestos and putrescible waste. Residents have complex relationships with contaminated sites in their neighbourhoods, and these relationships have for the most part not been adequately considered in engagement planning.

The evidence base provides insights into residents' perceptions and levels of acceptance including:

- how residents worry about different types of contamination and remediation options that are being applied within their local areas
- how residents perceive the risks of different types of contamination and remediation options, and how they perceive the benefits of different remediation options that are applied in their local areas
- the extent to which residents accept different remediation options that are applied in their local areas.

Furthermore, the evidence base provides insights into how residents' levels of worry, risk and benefit perception, or acceptance might be affected by:

- the residents' characteristics (e.g. gender, income, education, children living in the home).
- residents' physical environments (e.g. transportation of contaminants through local streets, sense of place, proximity, impact of contamination on daily life, amenity impacts)
- institutional engagement, that is, the ways in which institutions engage with residents about contaminated sites, the contamination, and the ways in which their remediation affects residents' perceptions and acceptance of the contamination and remediation technologies (e.g. trust, confidence in experts, language used by organisations to communicate with residents)
- contaminant and technology option characteristics, that is, the attributes of the contamination or remediation options that affect residents' perceptions and acceptance (e.g. type, location, naturalness, safety).

We provide a brief overview of each of these influences below. A more detailed discussion of the conceptual frameworks and methodology used, and the evidence obtained, is presented in a series of published journal papers.[27]

An Australian study has shown that residents' worry about contamination can be accompanied by negative, debilitating feelings of fear, tiredness, exhaustion, unhappiness, despondency, violation and exposure. For some, a feeling is connected with possible bodily contamination. One participant stated, *'Poisons in the air and the food we eat. … It worries me, I feel exposed and frightened. I'm tired and exhausted from it all'.* Another said, *'It makes you feel uneasy when you think it is at a site where people are living, it might get into the drinking water … it scares me'.* Others felt a loss of agency; for instance: '*The little creek down the road, I am worried about that … but what can I do?'*

- Prior et al., "A geography of residents' worry about the disruptive effects of contaminated sites.", p.61 [28]

Resident characteristics

The evidence demonstrates that residents' levels of worry about contamination in their neighbourhood, levels of worry about remediation options, levels of acceptance of remediation options, and perceptions about the degree of risk to human and environmental health are affected by their sociodemographic characteristics and psychological vulnerabilities. Psychological vulnerabilities in this context refer to residents' beliefs, cognitions, emotions (e.g. fear) and behaviours (e.g. avoidance).[29] See Table 1 for a summary of this evidence.

Table 1. Resident characteristics found to predict level of worry about contamination, level of worry about remediation options, acceptance of remediation options, perceptions about the degree of health and environmental risk and benefit of remediation.

Resident characteristics		Worry about contamination	Worry about remediation	Acceptance of remediation	Belief about health risk from remediation	Belief about environmental risk from remediation	Belief about health benefit from remediation	Belief about environmental benefit from remediation
Sociodemographics	Gender	✓	✓					
	Education Level							
	Age	✓			✓			
	Household Income	✓	✓	✓				
	Home Tenure							
	Children at home	✓	✓	✓				
	CALD Background	✓	✓		✓			
	Illness or Disability	✓						
Psychological vulnerabilities	Negative Emotions	✓						
	Uncertainty about health risks	✓			✓			
	Belief about control over contaminant	✓			✓			
	Belief about effect on health and wellbeing	✓	✓	✓	✓		✓	
	Belief about effect on environment	✓	✓	✓		✓		✓
	Belief about need to balance types of risk				✓	✓	✓	✓

Resident relationship with physical environment

The evidence base demonstrates that factors related to a resident's relationship with the physical environment of their neighbourhood influence their level of worry about contamination in their neighbourhood, the remediation options, their level of acceptance of remediation options, and their perceptions about the degree of risk to human and environmental health.[30] These neighbourhood environment factors may be tangible (e.g. resident's distance from the source site) or subjective (e.g. sense of place) and relate to how residents behave in their communities as a consequence of the impact of the contamination and remediation on their day-to-day life, and the ways they perceive themselves and their neighbourhoods and communities within the context of how the contamination and remediation has changed the local environment. See Table 2 for a summary of resident environment factors.

Resident relationship with the contamination and remediation options, and institutional engagement

Evidence has identified diverse attributes related to the contamination and remediation options that influence residents' levels of worry about contamination and remediation options in their neighbourhoods, their levels of acceptance of remediation options, and their perceptions about the degree of risk to human and environmental health.[31] These contamination and remediation attributes relate to the:

- contaminant's characteristics (e.g. type of contaminant present, sensory characteristics)
- institutional engagement (e.g. level of trust, engagement style)
- remediation options characteristics (e.g. type and location of remediation options)
- beliefs about remediation options (e.g. safety, effectiveness).[32]

Table 3 summarises the remediation attributes and residents' responses to and perceptions about them.

Table 2. Resident environment factors found to predict level of worry about contamination, level of worry about remediation options, acceptance of remediation options, and beliefs about the degree of health and environmental risk and benefit of remediation.

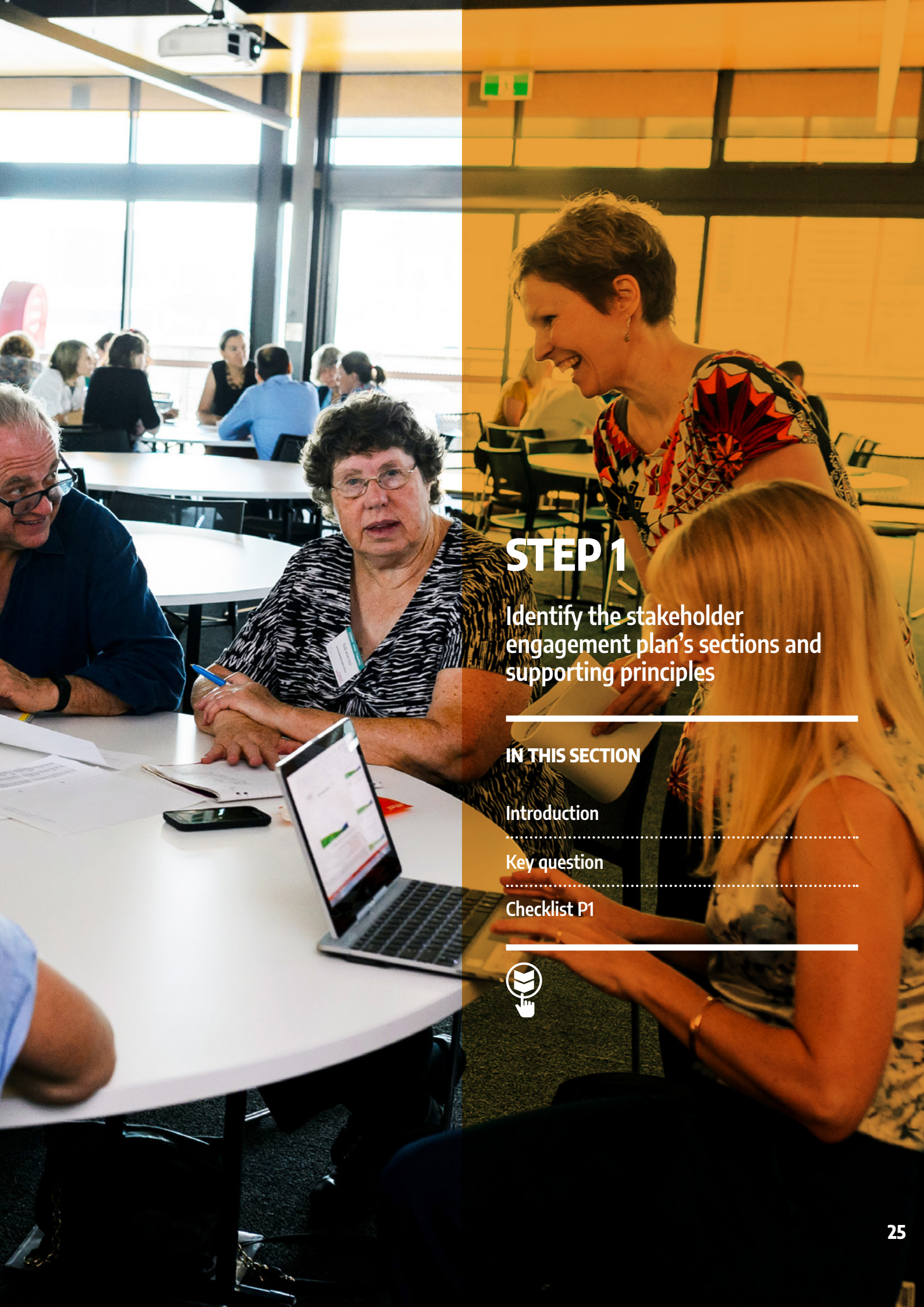
Resident physical environment factors		Worry about contamination	Worry about remediation	Acceptance of remediation	Belief about health risk from remediation	Belief about environmental risk from remediation	Belief about health benefit from remediation	Belief about environmental benefit from remediation
Physical factors	Knowledge of contaminant	✓						
	Transport of contaminant throgh neighbourhood		✓	✓	✓	✓	✓	✓
	Resident's distance from contaminated site	✓			✓			
	Community capacity	✓						
	Impacts on lifestyle	✓	✓	✓	✓	✓	✓	✓
	Changes to home and neighbourhood environment	✓	✓	✓	✓	✓	✓	✓
	Changing place / transition	✓	✓	✓	✓	✓	✓	✓
	Contact with contamination	✓			✓			
Subjective experience	Sense of place	✓						
	Contamination features in life		✓		✓	✓		
	Perceived stigma	✓						

Table 3. Remediation attributes found to predict level of worry about remediation options, acceptance of remediation options, beliefs about the degree of health and environmental risk and benefit of remediation options.

Attributes		Worry about remediation	Acceptance of remediation	Belief about health risk from remediation	Belief about environmental risk from remediation	Belief about health benefit from remediation	Belief about environmental benefit from remediation
Institutional engagement	Generally trusting (personal attribute)			✓	✓	✓	✓
	Trust in centralised organisations (e.g. government organisations)	✓		✓	✓	✓	✓
	Trust in commercial organisations (e.g. media companies, local businesses)						
	Government should regulate technology	✓				✓	
	Confidence in experts	✓			✓	✓	✓
	Engagement language and style	✓		✓			
Remediation options characteristics	Chemical Remediation	✓	✓	✓	✓	✓	✓
	Physical Remediation	✓	✓	✓	✓	✓	✓
	Thermal Remediation	✓	✓	✓	✓	✓	✓
	Biological Remediation	✓	✓	✓	✓	✓	✓
	On-site in-ground treatment	✓	✓	✓	✓	✓	✓
	On-site out-of-ground treatment	✓	✓	✓	✓	✓	✓
	Off-site treatment	✓	✓	✓	✓	✓	✓

Table 3. (continued)

Attributes		Worry about remediation	Acceptance of remediation	Belief about health risk from remediation	Belief about environmental risk from remediation	Belief about health benefit from remediation	Belief about environmental benefit from remediation
Beliefs about remediation options	Technology solves our problems		✓			✓	✓
	Should use natural methods	✓					
	Effectiveness	✓	✓	✓	✓	✓	✓
	Safety		✓	✓	✓	✓	✓
	Economy	✓	✓				
	Containment	✓	✓	✓	✓	✓	✓
	Controllability	✓		✓	✓	✓	✓
	Location	✓	✓	✓	✓	✓	✓
	Proven	✓	✓				
	Duration	✓	✓				
	Naturalness	✓	✓	✓	✓	✓	✓
	Plausibility	✓	✓				



STEP 1

Identify the stakeholder engagement plan's sections and supporting principles

IN THIS SECTION

STEP 1

Identify the stakeholder engagement plan's sections and supporting principles

➨ Introduction

Step 1 of this guide is designed to provide the user with an understanding of the different sections of a stakeholder engagement plan. The checklist within Step 1 provides the user with an understanding of:

- the content of each section of the plan
- the principles that support each section of the plan
- how information in the checklists within Steps 2, 3, 4 and 5 of this guide can be used to develop each section of the plan.

A stakeholder engagement plan is an evolving document that will need to be responsive to stakeholder input and to the changing circumstances at the contaminated site, to ensure that it remains appropriate.[33]

Depending on the size and complexity of a contaminated site, a stakeholder engagement plan may be required by consent authorities as part of an overall remediation and management plan, or it may be provided as a separate document.[34] Depending on the circumstances surrounding a site, a stakeholder engagement plan may range from a few pages to a few hundred pages. The period of research, mapping and scoping that informs the development of a stakeholder engagement plan not only provides information that may be required by a consent authority —it also helps to develop a clearer understanding of the role that stakeholder engagement should and will perform during the life of the project.[35]

Step 1 contains one checklist which helps the user address one key question. We first present the key question that guides the checklist in this step, and then present the checklist. The letter "P" is used to identify the checklist in Step 1, and is a reference to the step's focus on the Plan's sections and Principles that guide each section of the plan. The checklist presents existing evidence[36], guidance[37], and associated questions to help the user develop the various sections of a stakeholder engagement plan.

➨ Key question

What are the stakeholder engagement plan's sections and supporting principles?

CHECKLIST P1 What are the stakeholder engagement plan's sections and supporting principles?

This checklist provides an overview of the typical sections of a stakeholder engagement plan. While the structure of the plan and its accompanying detail may vary, a stakeholder engagement plan will generally contain the following sections (in the order described):

1. **Background section** provides a clear description of the overall project, key issues, previously used engagement techniques, and the consent authority's engagement requirements.
2. **Identification of stakeholders section** includes a list of stakeholder types that will be engaged with through the plan.
3. **Objectives of stakeholder engagement section** provides a description of the key objective(s) of the plan, and the negotiable and non-negotiable aspects of the plan's objective(s).
4. **Stakeholder engagement techniques section** provides a description of the engagement techniques that will be used to address the plan's objective(s).
5. **Mapping and responding to stakeholder contributions section** which outlines how issues, concerns, questions and information raised by stakeholders, including media, will be effectively managed across the plan's different engagement activities.
6. **Reporting section** provides a commitment on how engagement feedback will be reported to stakeholders and consent authorities.
7. **Administrative and management section** provides a clear description of the human and financial resources needed to support the plan, and the plan's timeframe and key milestones.
8. **Updating and evaluation strategy section** provides a framework for updating and evaluating the plan and its engagement activities.
9. **Appendix – Key engagement documents** including a statement of intent.

The checklist also identifies key principles that guide each section of the plan. These principles are adapted from those used in current contaminated site guidance and policy documents in Australia and internationally.[38]

CHECKLIST : P1

Section	Code	Existing guidance to support the development of different sections of the plan	Questions to consider as you develop different sections of your plan, and where in the guide's checklists you will find information to help you with each section
Background	P 1.1	**Current knowledge of the contaminated site:** This section of the plan includes a description of the overall understanding of what is currently known about the contamination and its impacts on stakeholders, based on the site's investigations, remediation and ongoing management planning, in order to provide context for the stakeholder engagement process. The plan should be updated accordingly as new information comes to light or conditions onsite change.	**Q** Does the **background section** of the plan include a description of the overall understanding of what is currently known about the contamination and its impacts on stakeholders, based on the site investigations, remediation and ongoing management planning? When addressing this question consider: ☑ **Checklist C1** (in particular items **C1.1–C1.6**) in Step 3 for further guidance on understanding what is known about the contamination and its impacts on stakeholders based on the site's investigations. ☑ **Checklist R1** (in particular items **R1.1– R1.4**) in Step 4 for further guidance on understanding what is known about the contamination and impacts on stakeholders based on the site's remediation and ongoing management planning.
	P 1.2	**Key issues:** This section of the plan should include a description of key issues and associated stakeholder concerns that will be addressed through the stakeholder engagement program. These key issues and associated stakeholder concerns may relate to the contamination, and/or the site's remediation and management approaches. The term 'issues' can cover a range of events or actions where a decision of some form is likely to be made. A project can be based on a single issue or, as is more likely on a contaminated site, can be made up of multiple issues. Whilst the risk management associated with the contaminant at the site is often the key issue, it is often not the only issue. The stakeholder engagement plan should consider the main project issues (e.g. that a contaminated site is being remediated), along with any potential separate issues within components of the project (e.g. that there are a number of remediation options that may or may not be appropriate for the site). *(continued)*	**Q** Does the **background section** of the plan include a description of key issues and associated stakeholder concerns that will be addressed through the stakeholder engagement program? When addressing this question consider: ☑ **Checklist C1** in Step 3 for key issues that were identified during the site's investigations. ☑ **Checklist C2** in Step 3 for further guidance on key issues and associated stakeholder concerns that might arise as a result of the history of the contaminated site. *(continued)*

CHECKLIST : P1 (continued)

Section	Code	Existing guidance to support the development of different sections of the plan	Questions to consider as you develop different sections of your plan, and where in the guide's checklists you will find information to help you with each section
Background	P 1.2 cont.	It is important to allow for the fact that issues can be viewed in potentially countless ways, depending on a person's interests, backgrounds and experience. When deciding which issues would benefit from inclusion in a stakeholder engagement plan, it is useful to consider whether any, some, or all of the following statements apply to the issue in question: ▸ The issue affects the rights and entitlements of stakeholders. ▸ The issue is likely to affect people's health, wellbeing and quality of life. ▸ The issue affects the natural environment. ▸ A significant number of people, or particular groups, are likely to have strong and/or competing views on the issue (both negative and positive). ▸ Insufficient information is available on which to make a decision about an issue. ▸ The issue is technically complex. ▸ The organisation undertaking the remediation and management project genuinely wants to find out the views of stakeholders. ▸ Agreement and acceptance by stakeholders will be critical to the longer-term success of the project.[39] The type of concerns that might be held by stakeholders with an interest in activities occurring on a contaminated site may be related to the impacts of the contamination, and/or be associated with the site's remediation and ongoing management approaches. Obviously, not all stakeholders will be concerned with every issue. For example, the concerns of local residents are likely to differ from the concerns expressed about the site by an environmental protection interest group.[40]	☑ **Checklist C3** in Step 3 for further guidance on key issues and associated stakeholder concerns that might arise as a result of the contamination at the site. ☑ **Checklist R1** in Step 4 for further guidance on key issues identified during the site's remediation and ongoing management planning. ☑ **Checklist R2** and **R3** in Step 4 for further guidance on key issues and associated stakeholder concerns that might arise as a result of the remediation and ongoing management approaches identified.

CHECKLIST : P1 (continued)

Section	Code	Existing guidance to support the development of different sections of the plan	Questions to consider as you develop different sections of your plan, and where in the guide's checklists you will find information to help you with each section
Background	P 1.3	**Previous stakeholder engagement:** This section of the plan includes a summary of any stakeholder engagement that may have already taken place before the development of this plan (e.g. during preliminary investigations at the site).[41] In particular these will include the identification of key issues raised by different stakeholders, their concerns for these issues, and how these issues and concerns have been addressed to date through engagement activities.	**Q** Does the **background section** of the plan include a summary of any stakeholder engagement that may have already taken place?
	P 1.4	**Consent authority's engagement requirements:** This section of the plan includes a summary of any consent authority requirements for stakeholder engagement. The NSW Environment Protection Authority (NSW EPA) or other consent authority should always be consulted regarding: ▸ any specific stakeholder engagement requirements for the contaminated site ▸ the structure and content of the stakeholder engagement plan to ensure that it is in line with any documentation and reporting requirements.[42] The NSW EPA may regulate site contamination if it believes the contamination is significant enough to warrant regulation.[43] There does not have to be a new use proposed on the land for this to occur. The NSW EPA may declare the site to be significantly contaminated land and issue a management order or approve a voluntary management proposal to require investigation and/or remediation of a site.[44] The NSW EPA may require engagement of residents and other stakeholders for significantly contaminated land as a condition(s) within a management order, approved voluntary management proposal, ongoing maintenance order.[45] Where the consent authority for a contaminated site is not the NSW EPA, it may be regulated through the NSW planning process. Within this context the consent authority may involve the NSW department responsible for planning, or a delegated authority (e.g. local government). Through the planning system, identification of site contamination and the need for its remediation may result from: strategic planning or rezoning activity (e.g. land use changes over large areas of formerly rural land), development control planning [46] or development planning. The planning consent authority for the site may impose requirements for engaging with residents and other stakeholders as part of their condition(s) for consent.[47]	**Q** Does the **background section** of the plan identify any conditions for engagement or documentation requirements laid down by the consent authority (NSW EPA, NSW Department of Planning, local council or other consent authority)?

(continue for ☼)

CHECKLIST : P1 (continued)

Section	Code	Existing guidance to support the development of different sections of the plan	Questions to consider as you develop different sections of your plan, and where in the guide's checklists you will find information to help you with each section
		The following principle determines the information included in the **background section** of the plan: ➨ **Plan carefully** by understanding what is currently known about the site, contamination, site investigation, remediation planning and management, stakeholder engagement, and the regulatory requirements for engagement.[48]	
Identification of stakeholders	**P 1.5**	**Stakeholder identification:** This section of the plan includes the names of potential stakeholders (individuals and groups), and organisations who may assist and support engagement with these stakeholders. This section of the stakeholder engagement plan will identify the stakeholders that are affected by, or have an interest in, the contaminated site and its investigation, remediation and ongoing management. The individuals and groups that are affected by, or have an interest in, the activities occurring on a site will vary, depending on the surrounding community and a range of site-specific factors. Of particular importance is the identification of those stakeholders who may be affected by the contamination and need to be involved in any risk communication and/or engagement technique during the investigation, remediation and management of the contaminated site. Keep in mind that within these groups there will be people with different backgrounds, resulting in a diverse range of perspectives, expectations and concerns that will need to be considered throughout the project. It is also important to remember that the identification and inclusion of stakeholders in any engagement program is an ongoing process. You may need to include new and different stakeholders, whether individuals or groups, at any stage in the engagement process, particularly if the project is extensive in size or time.[49] For example, if site works establish that contamination is greater than previously believed based on site investigations, then more stakeholders (e.g. landowners) may be affected and should therefore be included in the engagement process.[50]	**Q** Does the **identification of stakeholders section** of the plan include the names of potential stakeholders (individuals and groups), and organisations which may assist and support engagement with these stakeholders? When addressing this question consider: ☑ **Checklists S1, S2, S3, S4** in Step 2 for further guidance on how to identify stakeholders for the plan.

CHECKLIST : P1 (continued)

Section	Code	Existing guidance to support the development of different sections of the plan	Questions to consider as you develop different sections of your plan, and where in the guide's checklists you will find information to help you with each section
Identification of stakeholders	**P 1.6**	**Stakeholder requirements:** This section of the plan should include details about how stakeholders have been/will be invited to engage and any specific engagement requirements stakeholders (either as individuals or groups) may have. Stakeholders are not a homogenous group, and it is important to recognise that diverse characteristics such as gender and cultural background can affect how they engage.[51] Where possible, engage with stakeholders during the development of the plan to determine how different stakeholders wish to be engaged and if they wish to be engaged at all.	**Q** Does the **identification of stakeholders section** of the plan include details about how stakeholders have been/will be invited to engage and any specific engagement requirements stakeholders may have? When addressing this question consider: ☑ **Checklists S1, S2, S3, S4** in Step 2 for further guidance on how to identify the needs of different stakeholders.

The following principles determine what information is included in the **identifying stakeholders section** of the plan:

- **Plan carefully** by identifying the engagement plan's stakeholders.
- **Accept stakeholders as legitimate** by engaging all stakeholders that are potentially affected by, or have an interest in, the contaminated site and its investigation, remediation and ongoing management.[52]
- **Coordinate stakeholder engagement with other credible sources** by building bridges with other organisations and groups that can provide reliable, credible information and advice.[53]
- **Meet the needs of stakeholders** by being aware of and sensitive to different cultural behaviours and preferred methods of engagement.[54]

Objectives of stakeholder engagement	**P 1.7**	**Plan's objectives:** This section of the plan includes details about the objectives of the stakeholder engagement plan. This section enables everyone identified within the plan to be clear about what they expect to be achieve through the engagement plan. Each objective identified for the stakeholder engagement plan will be a combination of: ▸ **issue(s)** that need to be addressed *(continued)*	**Q** Does the **objectives of stakeholder engagement section** of the plan provide details about the stakeholder engagement plan's objectives? *It is only possible to address this question once you have clarity about the plan's key issues and stakeholders (see P1.1–P1.6 above).* *(continued)*

CHECKLIST : P1 (continued)

Section	Code	Existing guidance to support the development of different sections of the plan	Questions to consider as you develop different sections of your plan, and where in the guide's checklists you will find information to help you with each section
Objectives of stakeholder engagement	**P 1.7 cont.**	▸ **the level(s) of engagement with stakeholders** that is needed to address the issue(s). Broadly, levels of engagement range from the lowest level of stakeholder engagement which is simply to inform, up to consultation, involvement, collaboration, and the highest level of engagement which is to empower. The higher the level of engagement, the more influence the stakeholders have over decisions about a given issue, and each level can be appropriate depending on the context. Higher levels are not necessarily better. For example, it is better to just inform stakeholders, and make it clear that stakeholders have no influence over a decision when there is no opportunity for stakeholders to influence a decision. Agreeing on the objectives for the stakeholder engagement plan will help to determine the scope and depth of the engagement. The objective(s) of the stakeholder engagement plan will vary from site to site, and can be singular or plural. For example, the objective of the stakeholder engagement plan at one contaminated site may be to inform stakeholders of the site investigations, ongoing management, or elements of the project that may have an impact on them. At another contaminated site the objectives of the engagement plan may need to be tailored to the issues faced by different stakeholders, and may include: ▸ **informing** all stakeholders about the site investigations, remediation and ongoing management process at the site ▸ **involving** affected residents by obtaining their input into the identification of remediation approaches that will be applied to address the contamination ▸ **collaborating** with local Aboriginal stakeholders who have sacred sites within an investigation zone to determine how site investigations and remediation works are carried out near those sacred sites. Selecting levels of engagement for specific issues does not mean that the level cannot change over time.[55]	When addressing this question consider: ☑ **Checklist E1** (in particular items **E1.1–E1.7**) in Step 5 for further guidance on the different levels of engagement that may be used with stakeholders.

CHECKLIST : P1 (continued)

Section	Code	Existing guidance to support the development of different sections of the plan	Questions to consider as you develop different sections of your plan, and where in the guide's checklists you will find information to help you with each section
Objectives of stakeholder engagement	P 1.8	**Negotiable and non-negotiable aspects of the plan's objectives:** This section of the plan needs to clearly outline the negotiable and non-negotiable aspects of the plan's objectives. This is particularly important when the plan's objectives are carried out at higher levels of engagement, such as through the involvement of, or collaboration with, stakeholders. Explanations about the negotiable and non-negotiable aspects of the plan's objective(s) help to clarify the boundaries and limitations of the engagement plan as a whole, and of individual engagement activities. Negotiable items are those choices and options and outcomes that can be changed to reflect or incorporate stakeholder input. Non-negotiable items are those things already set that cannot be changed or negotiated. They might include standards and policies that must be adhered to, or the time and resources available.[56] For example, if stakeholders are to be involved in decisions around remediation options for the site, then it is important to explain that they will have input into the selection of one of a range of possible remediation approaches that have already been identified for the site by remediation experts.	**Q** Do the **objectives of the stakeholder engagement section** clearly outline the negotiable and non-negotiable aspects of the plan's objectives?
	P 1.9	**Stakeholders' involvement in setting objectives:** This section of the plan clearly outlines how stakeholders have been or will be engaged in the setting of the plan's objectives. Whilst it may not always be possible or appropriate to engage stakeholders in setting the plan's objectives, engaging stakeholders in the identification of the plan's objectives has a number of advantages, including the early development of good working relationships with stakeholders, and the management of expectations regarding the engagement program. The extent to which stakeholders are engaged at this stage will depend on the size and complexity of the project.[57]	**Q** Does the **objectives of stakeholder engagement section** of the plan clearly outline if and how stakeholders have been or will be engaged in the setting of the plan's objectives?

The following principles determine what information is included in the **objective of the stakeholder engagement section** of the plan:

- **Plan carefully** by clearly defining the objectives of the stakeholder engagement plan.[58]
- **Accept stakeholders as legitimate** by inviting stakeholders to have input into the objectives of the engagement plan.[59]
- **Listen to stakeholders' specific concerns** so as to develop a stakeholder engagement plan that has the support of the stakeholders.[60]

CHECKLIST : P1 (continued)

Section	Code	Existing guidance to support the development of different sections of the plan	Questions to consider as you develop different sections of your plan, and where in the guide's checklists you will find information to help you with each section
Stakeholder engagement techniques	**P 1.10**	**Plan's engagement techniques:** This section of the plan includes details about the different engagement techniques that will be used to carry out the plan. Within this section it is important to provide details about the way each engagement technique will be approached, including: ▸ identification of how each engagement technique will address the plan's objectives ▸ clear explanations about the negotiable and non-negotiable aspects of the issue(s) that is the focus of each engagement technique ▸ identification of the types of stakeholders that will take part in each engagement technique ▸ identification of the frequency and timing for each engagement technique (e.g. the decision to use three workshops to engage stakeholders at key stages of the site investigation process). ▸ identification of how different engagement techniques related to each other (e.g. how does the decision to engage using stakeholder workshops relate to the decision to provide information via a project website and social media?) ▸ identification of what will be done with information collected from stakeholders through each engagement technique, including how information will be used and stored to maintain levels of confidentiality and privacy agreed with stakeholders.	**Q** Does the **stakeholder engagement techniques section** identify the techniques that will be used to carry out the plan? *It is only possible to address this question once you have clarity about the engagement plan's stakeholders and objectives (see P1.1-P1.6 above).* When addressing this question consider: ☑ **Checklist E1** (in particular items **E1.8–E1.11**) in Step 5 for further guidance on a variety of engagement techniques that can be considered to carry out the plan. ☑ **Checklist E1** (in particular items **E1.2–E1.6**) in Step 5 for examples of engagement techniques that have been used within engagement processes at NSW contaminated sites to support different levels of engagement with stakeholders ☑ **Checklist E2** (in particular item **E2.13**) in Step 5 for further guidance on engaging with the media.

CHECKLIST : P1 (continued)

Section	Code	Existing guidance to support the development of different sections of the plan	Questions to consider as you develop different sections of your plan, and where in the guide's checklists you will find information to help you with each section
Stakeholder engagement techniques	P 1.11	**Staff trained in risk communication:** This section of the plan should detail how those delivering the plan's engagement techniques will be either trained in engaging about such concepts as risk, uncertainty, benefit and trust, or will be provided with guidance on how to effectively engage in dialogue with stakeholders about such concepts. The NSW EPA and other consent authorities in NSW expect that engagement techniques outlined in the plan will be used to engage relevant stakeholders in the risk management decisions that are taken during the investigation, remediation and management of a contaminated site. They further expect that the stakeholder engagement plan will be used to put in place effective risk communication and management strategies relating to the site's contamination. At its best, risk communication is an interactive process involving the exchange among individuals, groups and institutions of information and expert opinion about the nature, severity and acceptability of risks and the decisions to be taken to combat them. Risk communication with stakeholders is carried out most efficiently in the context of a well-structured stakeholder engagement plan.[61]	**Q** Does the **stakeholder engagement techniques section** provide clear guidance on the training that is needed to support effective dialogue about key concepts (e.g. risk, benefit and uncertainty) during the delivery of engagement techniques? When addressing this question consider: ☑ **Checklist E2** (in particular items **E2.15–2.19**) in Step 5 for information on addressing risks, benefits and uncertainty during the delivery of engagement techniques.
	P 1.12	**Strategies to promote access to engagement techniques:** This section of the plan includes details about strategies in place to remove or lower barriers to accessing engagement techniques that may be used within the plan (e.g. using online focus groups rather than face-to-face focus groups where remote stakeholders are involved).	**Q** Does the **stakeholder engagement techniques section** of the plan provide detail on strategies that have been put in place to remove or lower barriers to stakeholder access to engagement techniques? When addressing this question consider: ☑ **Checklist E2** (in particular items **E2.1–E2.9**) in Step 5 for further guidance on items that can be considered to remove or lower barriers to accessing engagement techniques.

CHECKLIST : P1 (continued)

Section	Code	Existing guidance to support the development of different sections of the plan	Questions to consider as you develop different sections of your plan, and where in the guide's checklists you will find information to help you with each section
Stakeholder engagement techniques	**P 1.13**	**Stakeholder involvement in selection and design of engagement techniques:** This section of the plan should clearly outline how stakeholders have been or will be engaged in the selection and design of engagement techniques. The engagement of stakeholders in the selection and design of engagement techniques can have a number of advantages, including: ▸ the early development of good working relationships with stakeholders ▸ management of expectations during the delivery of engagement techniques ▸ clarification of the objectives being addressed through engagement techniques ▸ increase stakeholder participation ▸ identification of barriers that might reduce stakeholder participation It may be that early engagement identifies that stakeholders are satisfied that the project (or elements of the project) should proceed promptly. In this case, it may not be necessary to undertake wide and comprehensive engagement activities, although there will remain a need for techniques to be used to keep stakeholders informed of progress.[62]	**Q** Does the **stakeholder engagement technique section** of the plan clearly outline if and how stakeholders have been or will be engaged in the design of engagement activities?

The following principles determine what information is included in the **stakeholder engagement technique section** of the plan:

- **Plan carefully** by identifying, acknowledging and addressing the stakeholders' perceptions.[63]
- **Accept stakeholders as legitimate** by inviting stakeholders to engage in the design of the engagement plan; focusing on engaging stakeholders to enable their participation; engaging early with stakeholders; and never underestimating the level of technical knowledge of stakeholders.[64]
- **Listen to stakeholders' specific concerns** by not making assumptions about what people know, think or feel – take time to find out; allowing all interested parties the opportunity to be heard; being empathetic with stakeholders and trying to understand their concerns; understanding that trust, credibility, competence, fairness and empathy can be of as much or greater importance to stakeholders as facts and figures.[65]

(continued)

CHECKLIST : P1 (continued)

Section	Code	Existing guidance to support the development of different sections of the plan	Questions to consider as you develop different sections of your plan, and where in the guide's checklists you will find information to help you with each section

- **Meet the needs of stakeholders** by considering opportunities to assist stakeholders so that they can engage in the process, for example by providing assistance with travel to meetings, access to office facilities, free ways of responding to published material (e.g. free phone numbers, return envelopes); information in languages other than English, if appropriate; ensuring that information is readable, credible and publicly accessible, and written in a style and format (including site maps and diagrams) that encourages stakeholders to comment about general and specific issues, especially where technical detail is involved; and being aware of and sensitive to different cultural behaviours and preferred methods of engagement.
- **Coordinate with other credible sources** by trying to issue communications jointly with them – conflict and disagreement between organisations makes communication difficult and results in loss of credibility.[66]

- **Be honest, frank and open at all times** by not expecting to be trusted, and remembering that once trust is lost, it is very difficult to regain; acknowledging when you do not have all the answers, and commit to getting back to people with the answers in a given timeframe; disclosing information, including 'bad news' as soon as it comes to hand; not exaggerating or minimising the level of risk, by being honest about the risk; and by sharing as much information as possible.[67]
- **Speak clearly and with compassion, kindness and respect** by always using clear, plain language; simplifying language, not content; acknowledging and responding to emotions expressed by stakeholders, including worry, anger, fear, outrage and helplessness; not being patronising or condescending; showing respect for stakeholders' intelligence; respectfully re-stating a person's questions or statements in your own words to make sure you understand the question before answering it; discussing what you can do and what you will do; doing what you promise; remembering to tell people what you can't do, and why.[68]
- **Meet the needs of the media** by being accessible to the media, being open with information and respecting deadlines; providing information tailored to the needs of each type of media; preparing in advance and providing background information on issues; providing feedback (praise or criticism) to the media when appropriate; establishing, where possible, a good working relationship with media personnel; nominating one person to liaise with the media and providing the main point of contact; this helps to avoid conflicting or confused messages; and remembering that the media will want to report danger rather than safety, simplicity rather than complexity, and politics rather than risk.[69]

CHECKLIST : P1 (continued)

Section	Code	Existing guidance to support the development of different sections of the plan	Questions to consider as you develop different sections of your plan, and where in the guide's checklists you will find information to help you with each section
Mapping and addressing stakeholder contributions	**P 1.14**	**Procedures for addressing and mapping stakeholder contributions:** This section of the plan includes details about the way issues, concerns, questions and information raised by stakeholders (including media) across the plan's different engagement activities will be effectively managed by: ▸ keeping clear and transparent records of issues, concerns, questions and information raised by stakeholders and how they were addressed ▸ developing a system for mapping issues, concerns, questions and information so that consistent responses can be provided to different stakeholders about similar issues, concerns, questions and information ▸ keeping records of how and where commitments made to stakeholders were fulfilled ▸ keeping a clear and transparent record of how stakeholder contributions have been used to inform the process at the site.	**Q** Does the **mapping and addressing stakeholder contributions section** of the plan provide details of how issues, concerns, questions and information raised by stakeholders (including media) during the engagement process will be effectively managed? When addressing this question consider: ☑ **Checklist E2** (in particular items **E2.10–E2.14**) in Step 5 for information on how to effectively manage issues, concerns, questions and information raised by stakeholders (including media) across the plan's different engagement techniques.

The following principles determine what information is included in the **mapping and addressing stakeholder contribution section** of the plan:

- **Plan carefully** by recording accurately and comprehensively the nature and detail of stakeholder contributions and responses made through the stakeholder engagement activities.[70]
- **Listen to stakeholders' specific concerns** so as to develop a stake-holder engagement plan that has the support of the stakeholders.[71]

CHECKLIST : P1 (continued)

Section	Code	Existing guidance to support the development of different sections of the plan	Questions to consider as you develop different sections of your plan, and where in the guide's checklists you will find information to help you with each section
Engagement Reporting	**P 1.15**	**Stakeholder reporting procedures:** This section of the plan includes details of the reporting procedures that will be used to provide feedback to stakeholders following engagement, including the content and timing of the feedback. This section should clearly outline if and how stakeholders have been or will be engaged in the setting of reporting requirements (e.g. agree that minutes will be provided a week after a stakeholder advisory committee meeting). Whilst it may not always be possible or appropriate to engage stakeholders in setting reporting requirements, engaging stakeholders in identification of the plan's reporting requirements has a number of advantages, including managing expectations regarding the timing and type of information they will receive through the reporting about the engagement plan and its activities.	**Q** Does the **reporting section** of the plan include details about reporting procedures for providing feedback to stakeholders following engagement? When addressing this question consider: ☑ **Checklist E3** (in particular item **E3.1**) in Step 5 for further guidance on reporting back to stakeholders.
	P 1.16	**Consent authority reporting requirements:** This section of the plan includes details about reporting that will be provided to consent authorities (e.g. NSW EPA) regarding the stakeholder engagement plan and its delivery, including the content and timing of any reporting. Reporting obligations for contaminated sites in NSW may include the provision of information about the engagement techniques use to engage with the individuals and groups that may have an interest in, or are affected by, a contaminated site.[72] *(continue for ☼)*	**Q** Does the **feedback and reporting section** of the plan include details about the reporting requirements of consent authorities for stakeholder engagement? *It is only possible to address this question once there is clarity about consent authority requirements for reporting on stakeholder engagement associated with the contaminated site (see P1.4 above).* When addressing this question consider: ☑ **Checklist E3** (in particular item **E3.2**) in Step 5 for further guidance on reporting back to consent authorities.

CHECKLIST : P1 (continued)

Section	Code	Existing guidance to support the development of different sections of the plan	Questions to consider as you develop different sections of your plan, and where in the guide's checklists you will find information to help you with each section
		The following principles will determine what information is included in the **engagement reporting section** of the plan: ➨ **Plan carefully** by establishing feedback processes for each engagement technique as well as the overall program.[73] ➨ **Listen to stakeholders' specific concerns** to develop a stakeholder engagement plan that has the support of the stakeholders.[74] ➨ **Meet the needs of stakeholders** by ensuring that information is readable, credible and publicly accessible, and written in a style and format (including site maps and diagrams) that encourages stakeholders to comment about general and specific issues, especially where technical detail is involved; and by being aware of and sensitive to stakeholders' different cultural behaviours and preferred methods of engagement.[75] ➨ **Coordinate with other credible sources** by trying to issue communications jointly with other credible sources – conflict and disagreement between organisations makes communication difficult and results in loss of credibility in the engagement process.[76]	
Administrative and management	**P 1.17**	**Human resources:** This section of the plan includes details of the human resources that are needed to carry out the engagement plan. This is about personnel – staff, government officials, and volunteers – who will be implementing the stakeholder engagement program, including those who may be contracted to conduct all or any aspects of the plan.	**Q** Does the **administrative and management section** of the plan provide details of the human resources needed to carry out the engagement plan? When addressing this question consider: ☑ **Checklist E1** (in particular items **E1.15–E1.18**) in Step 5 for further guidance on human resources to consider to implement the plan.
	P 1.18	**Financial resources:** This section of the plan includes details of the financial resources needed to carry out the engagement plan.	**Q** Does the **administrative and management section** of the plan provide details of the financial resources needed to carry out the engagement plan? When addressing this question consider: ☑ **Checklist E1** (in particular item **E1.19**) in Step 5 for further guidance on financial resources needed to carry out the plan.

CHECKLIST : P1 (continued)

Section	Code	Existing guidance to support the development of different sections of the plan	Questions to consider as you develop different sections of your plan, and where in the guide's checklists you will find information to help you with each section
Administrative and management	P 1.19	**Resources needed to promote stakeholder engagement:** This section of the plan includes details of the administrative support/financial resources the stakeholders need to take part in the engagement plan. For example, some stakeholders, including some Aboriginal group representatives, may require payment of a fee (e.g. for services provided) or reimbursement of costs (e.g. travel costs), and they might also need assistance with administrative matters (e.g. drawing up an invoice on behalf of the people(s) consulted).	**Q** Does the **administrative and management section** of the plan provide details of the administrative support/ financial resources that are needed by stakeholders to carry out the engagement plan? When addressing this question consider: ☑ **Checklist E1** (in particular items **E1.12–E1.14**) in Step 5 for further guidance on support/resources needed by stakeholders to carry out the plan.
	P 1.20	**Plan's timeline:** This section of the plan includes details about the timeline, including identification of factors that may influence the timing of engagement activities, e.g. the meeting cycles of particular organisations and the need to allow ample time for participants to receive and reflect on information provided to them.	**Q** Does the **administrative and management section** of the plan provide details of the plan's timeline? When addressing this question consider: ☑ **Checklist E2** (in particular item **E2.4**) in Step 5 for further guidance on developing a timeline for the plan.
	P 1.21	**Identify process for addressing disputes:** This section of the plan includes details for managing disputes between stakeholders that are unlikely to be resolved purely by an engagement plan, through such mechanisms as negotiation or mediation. *(continue for ☼)*	**Q** Does the **administrative and management section** of the plan provide details of negotiation and mediation services that can be utilised to help alleviate the escalation of disputes that cannot be addressed within the engagement plan? When addressing this question consider: ☑ **Checklist E2** (in particular item **E2.20**) in Step 5 for further guidance on dispute resolution.

CHECKLIST : P1 (continued)

Section	Code	Existing guidance to support the development of different sections of the plan	Questions to consider as you develop different sections of your plan, and where in the guide's checklists you will find information to help you with each section
		The following principle will determine what information is included in the **administrative and management section** of the plan : ➨ **Plan carefully** by ensuring all relevant staff are trained in risk communication and/or stakeholder engagement; and by developing a timeline that allows sufficient time for the engagement process.[77]	
Updating and Evaluation strategy	**P 1.22**	**Strategy for updating the plan:** This section of the plan highlights that the stakeholder engagement plan will be updated whenever new stakeholders are identified, in response to stakeholder input, or in response to new situations or conditions on the site. Whilst the plan's updating is subject to a range of factors, the plan should identify a strategy for updating the plan on a regular basis, and many identify a procedure for agreeing to any changes to the plan (e.g. Will changes to the plan be agreed to through a regular stakeholder advisory committee meeting?).	**Q** Does the **updating and evaluation strategy section** indicate that the stakeholder engagement plan will be updated and responsive to changing circumstances at the site, identification of new stakeholders, and stakeholder input? When addressing this question consider: ☑ **Checklist E3** (in particular item **E3.3**) in Step 5 for further guidance on updating the plan.
	P 1.23	**Plan's evaluation strategy:** This section includes details of the stakeholder engagement plan's evaluation strategy. This section should outline the: ▸ agreed objectives of the evaluation strategy – for both the program as a whole, and for individual engagement activities ▸ evidence that will be used – the what and how of information collection ▸ resources required to undertake evaluation ▸ ways that the evaluation will be undertaken – the process and tools that will be used ▸ what will be done with the results of the evaluation. One objective of the evaluation strategy to consider very early in the engagement planning process is 'road-testing' the plan with key stakeholders before engagement activities commence to ensure that the appropriate stakeholders have been identified and that the plan is likely to meet stakeholder expectations.	**Q** Does the **updating and evaluation strategy section** include details of the stakeholder engagement plan's evaluation strategy? When addressing this question consider: ☑ **Checklist E3** (in particular **E3.4–E3.5**) in Step 5 for further guidance on developing the plan's evaluation strategy. *(continue for)*

CHECKLIST : P1 (continued)

Section	Code	Existing guidance to support the development of different sections of the plan	Questions to consider as you develop different sections of your plan, and where in the guide's checklists you will find information to help you with each section
		The following principles will determine what information is included in the **updating and evaluation section** of the plan: ➨ **Plan carefully** by including allowance for new developments or changes – be flexible and responsive.[78] ➨ **Evaluate effectively** by monitoring and evaluating the effectiveness of the stakeholder engagement plan and engagement activities; and by engaging stakeholders in the design of the engagement plan's evaluation strategy and the evaluation process.[79]	
Appendix – key engagement documents	**P 1.24**	**Provide copies of key engagement documents:** This section includes details about the information that will be provided to stakeholders through different engagement techniques e.g. key question and answer form. A key document to include in this appendix is the statement of intent. The statement of intent is a clear and concise summary of information set out in the stakeholder engagement plan. A statement of intent is a public document that can be easily provided to stakeholders. While it is similar in general content and structure to a stakeholder engagement plan, it has less detail; for example, while it may describe resources available for the program, it will not contain a detailed budget. It is best seen as a clear and concise summary document. Its purpose is to provide enough information to enable everybody involved to have a shared understanding of the engagement plan and how it will proceed. A statement of intent should include the following: ▸ background information about the site, incorporating a brief, clear statement about the project itself ▸ a description of the plan's key objectives and the major issues that are the focus of those objectives ▸ a broad description of stakeholders ▸ a clear statement about the negotiable and non-negotiable aspects/decision/ issues within the plan *(continued)*	**Q** Does the **Appendix - key engagement documents** include a statement of intent?

CHECKLIST : P1 (continued)

Section	Code	Existing guidance to support the development of different sections of the plan	Questions to consider as you develop different sections of your plan, and where in the guide's checklists you will find information to help you with each section
Appendix - key engagement documents	**P 1.24 cont.**	▸ a statement about the kind of involvement that is being sought ▸ a list of key engagement activities that will be used ▸ a commitment on how the information collected through the engagement activities will be used ▸ a commitment on how feedback will be given to stakeholders on how their input was used, and the reasons for final decisions ▸ a timeline for the engagement plan that allows sufficient time for stakeholders to discuss and form opinions on the issues ▸ a list of human and financial resources available for the engagement plan ▸ sources of further information, including website links and email and phone contact details for the person responsible for the engagement plan.[80]	

The following principle will determine the type of information included in the **appendix – key engagement documents section** of the plan principle:

➨ **Meet the needs of stakeholders** by ensuring that information is readable, credible and publicly accessible, and that it is written in a style and format (including site maps and diagrams) that encourages stakeholders to comment about general and specific issues, especially where technical detail is involved.[81]

STEP 2

Identify and consider those who may be affected by, or may have an interest in, the site contamination and its management and remediation

IN THIS SECTION

STEP 2

Identify and consider those who may be affected by, or may have an interest in, the site contamination and its management and remediation

➨ Introduction

Step 2 of the guide is designed to help the user identify the plan's stakeholders.

To develop an engagement plan, the user needs to identify and consider the residents and other stakeholders who may be affected by, or may have an interest in, the site contamination and its management and remediation.[82] For the purposes of this guide, 'stakeholder' means an individual, group, organisation or other entity that may be affected by, or interested in, the site contamination and its remediation and management. Depending on specific site circumstances, stakeholders may include residents, site owners, public health officials, government regulatory authorities, media outlets, businesses working onsite, environmental or other action/interest groups, and people working on the project.[83]

When identifying stakeholders for the engagement plan, existing evidence and guidelines indicate that it is important to appreciate the diverse interests, backgrounds and experiences of residents and other stakeholders in relation to the site contamination and its management and remediation.[84] For example, the interests of a resident who is living in a groundwater exclusion zone may differ from the interest in the site of an environmental protection interest group or a government authority interested in the technical aspects of the risk management process.[85]

Step 2 contains four checklists which help the user address four key questions. We first provide the four key questions that guide the four checklists in this step, and then present the checklists. The letter "**S**" in used to identify the checklists in Step 2, and is a reference to the step's focus on Stakeholders. The checklists present existing evidence[86], guidance[87], and associated questions to help the user to identify and consider those who may be affected by, or have an interest in, the site contamination and its management and remediation.

➨ Key questions

Does the plan identify and consider:

residents and landowners who are affected by, or have an interest in, the site contamination and its management and remediation?

groups, organisations or other entities, ranging from local interest groups through to government agencies, that are affected by, or have an interest in, the site contamination and its management and remediation?

residents and other stakeholders from culturally and linguistically diverse (CALD) backgrounds, including Indigenous people, who are affected by, or have an interest in, the site contamination and its management and remediation?

residents and other stakeholders who are living with chronic illness or disability who are affected by, or have an interest in, the site contamination and its management and remediation?

CHECKLIST S1

Does the plan identify and consider those residents and landowners who are affected by, or have an interest in, the site contamination and its management and remediation?

Related to : CASESTUDY 1

Existing guidance highlights the need for the plan to consider residents and landowners near the contaminated site who are affected by, or have an interest in, the site contamination and its management and remediation.[88] Moreover, this guidance suggests that consideration needs to be given to their personal and sociodemographic characteristics, such as gender[89] and age (i.e. young people[90] and seniors[91]), which can significantly influence how they experience, perceive and respond to contamination in their neighbourhood and its remediation. Australian research supports and expands on this guidance, highlighting that resident characteristics found to influence beliefs, attitudes and responses to contamination and remediation options include age[92], gender[93], household income[94], home tenure[95] and children living in the household.[96]

CHECKLIST S1

Resident Characteristic	Code	Existing guidance and evidence to support the plan's development	Questions to keep in mind as you develop your plan
Gender	S 1.1	**Gender:** When developing the plan, it is important to be aware that a person's gender can affect their level of worry.[97] Gender has been found to influence how residents perceive and experience the contamination and its remediation. Female residents are more likely then male residents to be worried about the application of remediation options[98] and the contamination in their neighbourhood.[99] Male residents are less likely to support the application of remediation options.[100]	**Q** Does the plan make provision for how different genders may be affected by the contamination and its remediation?
	S 1.2	**Promote gender equity:** Try to achieve a gender balance in the plan's engagement activities to ensure that participation reflects stakeholder diversity.[101]	**Q** Have you considered gender balance in the engagement activities within the plan to ensure resident diversity?
Young people	S 1.3	**Younger residents:** When developing the plan it is important to be aware of how young residents may experience the contamination.[102] Younger (35 and under) people are less likely to be worried about the contamination present in their neighbourhood compared to people between 36 and 74 years of age.[103]	**Q** Do the affected and interested residents include young people? Does the engagement strategy acknowledge that they might experience the contamination differently to people of other ages?
	S 1.4	**Youth organisations:** Consider whether organisations and agencies who work with young people could assist with the plan's engagement activities.[104]	**Q** What organisations and agencies work with young people? ■ Can you draw on these to assist with the plan's engagement activities?
Older people	S 1.5	**Older residents:** When developing the plan it is important to be aware of how older people may experience the contamination and its remediation.[105] Older (75 years+) residents are less likely to be worried about the contamination present in their neighbourhood compared to people between 36 and 74 years of age[106] and are less likely to be worried about the application of remediation options compared to younger adults.[107]	**Q** Do the affected and interested residents include older people? Does the plan acknowledge that they might experience the contamination differently to people of other ages?

CHECKLIST S1 (continued)

Resident Characteristic	Code	Existing guidance and evidence to support the plan's development	Questions to keep in mind as you develop your plan
Older people	S 1.6	**Senior organisations:** Consider whether organisations and agencies who work with older people could assist with the plan's engagement activities.	**Q** What organisations and agencies work with older people? ■ Can you draw on these organisations to assist with the plan's engagement activities?
Carers	S 1.7	**Residents with carer responsibilities:** When developing the plan it is important to consider how residents with carer responsibilities are engaged.[108] Be mindful of the carer responsibilities of parents, grandparents and others. Carers may be family members or friends (e.g. grandparents may provide childcare for grandchildren), but they may also come from organisations and services (e.g. a professional carer who looks after a person living with disabilities).[109]	**Q** Do the affected and interested residents include people with carer responsibility? ■ Does the plan acknowledge that carers may need assistance with their responsibilities to enable their engagement?
	S 1.8	**Carer support organisations:** Consider whether organisations and agencies who work with carers could assist with the plan's engagement activities (e.g. child care facilities).	**Q** What organisations and agencies work with carers? ■ Can you draw on these organisations to assist with the plan's engagement activities?
Households	S 1.9	**Household composition:** When developing the plan it is important to consider the composition of residents' households.	**Q** Has the plan considered the composition (e.g. families or individuals, low income or high income) of the households of affected and interested residents?
	S 1.10	**Households with children:** Having children living at home has been found to influence the degree to which residents are worried about the contamination and remediation. Residents who have children in the household are more likely to be worried about the application of remediation options[110] and about the contamination itself.[111]	**Q** Do affected and interested residents include those living in households with children? **Q** Does the plan consider that having children in their household may affect a resident's level of worry about the contaminants and their remediation?

CHECKLIST S1 (continued)

Resident Characteristic	Code	Existing guidance and evidence to support the plan's development	Questions to keep in mind as you develop your plan
Households	S 1.11	**Household income:** Researchers have found that household income level influences the degree to which people are worried about the application of remediation options. People earning incomes in the lowest bracket ($0–$40k annual household income) are likely to be more worried about the application of remediation options than those in the highest income ($120K+ annual household income).[112] Similarly, those on incomes between $80K to $120K are less likely to support the application of remediation options than those on higher incomes (over $120K).[113]	**Q** Does the plan consider the socioeconomic status of the affected and interested residents' households? **Q** Does the plan consider that affected and interested residents living in households earning lower incomes are more likely to be worried about the application of remediation options than those on higher incomes?
	S 1.12	**Household tenure:** The type of household tenure (ownership or rental) influences a resident's level of support for the application of remediation options in their local area. Residents who own or are purchasing a home in a neighbourhood affected by contamination are less likely to accept remediation options.[114] However, they are also less likely to worry about the contaminant[115] compared to those who do not own their home.	**Q** Does the plan consider the household tenure of affected and interested residents, and how this influences their support for the application of remediation options?

CASESTUDY 1

How gender affects residents' worries about the impacts of remediation options and how engagement can help to reduce worry: A case study of Homebush Bay, Olympic Park

CONTEXT

Timeframe	1990–2000
Site	Homebush Bay Olympic Park
Contaminant(s)	Mix of heavy metals, chemicals, solvents, asbestos, and waste
Selected remediation option	Mix of thermal desorption, solidification and off-site disposal
Issue	Gender and worry about the human and environmental health impacts of the use of remediation technologies
Related checklist	**Checklist S1** Does the plan identify and consider groups, organisations or other entities, ranging from local interest groups through to government agencies, that are affected by, or have an interest in, the site contamination and its management and remediation?

LESSONS LEARNED

- Sociodemographic factors, including gender, can influence worry about the use of remediation options.
- Gender should be taken into consideration when communicating information and engaging with residents as different issues of concern and extent of worry are evident amongst the different genders.
- Good practice involves tailoring information for different sociodemographic groups in order to help mitigate worry about the application of remediation options.

Situation

In the 1990s, in the run-up to the Sydney Olympic Games, investigations carried out by the NSW EPA on the soil and surface water at Homebush Bay revealed that the site was heavily contaminated with 400 hectares of land containing numerous contaminants harmful to both humans and the environment. These included heavy metals, dioxins, waste oil products, asbestos, pesticides, petroleum waste including persistent organic pollutants, polycylic aromatic hydrocarbon, dredged sediments, municipal waste, power station fly ash and gasworks waste.[116, 117]

Actions Taken

In 1995, the Olympic Coordination Authority (OCA) was established to plan and manage rehabilitation of the site for the Olympic Games preparation. The NSW Government allocated $137 million for remediation to be undertaken at the site (NSW Govt. 2018). This involved four types of actions applicable to the management of contaminated sediments: 1) thermal desorption, 2) solidification/stabilisation, 3) off-site disposal, and 4) waste management (Swane 2001: 36). Remediation activities were regulated by the NSW EPA and subject to conditions to ensure environmental protection and public safety.[118]

At the Homebush Bay site, women with very young children and especially those with disabled children, were more likely than men to be worried about noise from heavy machinery, foul smells and disruption caused by the remediation activities.[119, 120] A series of newspaper reports described how residents were especially worried about the general human health impacts of the remediation activities, with some commenting that the smell gave them headaches and coughs, despite official advice saying that the smell itself was not harmful to health.[121]

Government authorities also made a deliberate effort to ensure that extensive community consultation was undertaken throughout the remediation process.[122] This was undertaken to ensure that engagement captured a wide audience, including women with young children, who along with older people, were often more likely than others to spend the greatest amount of time at home. The Property Services Group (PSG) also kept key people informed through an environmental committee, who maintained contact through newsletters and brochures.[123] Information was tailored to provide answers about the human health risks and likely impacts of different remediation options for human health and the daily lives of those living in the area, including the risks for those spending significant time at home and the risks posed to young children.

Outcomes

The tailoring of information to specific sociodemographic groups helped to alleviate residents' worries about the impacts of the selected remediation option. Tailoring information about the risks posed to young children helped address the gendered dimension of worry at the Homebush Bay site.

Conclusion and recommendations

Research has shown that residents living nearby sites affected by environmental contamination often worry about the impacts of remediation options and processes on both human and environmental health.[124] Sociodemographic characteristics in particular, have been shown to influence the type and extent of an individual's worry about remediation options.[125, 126] Gender is one of the characteristics that is directly linked to levels of worry, with women being more likely to report higher levels of worry than men.[127] Evidence also suggests that gender has a very significant effect on the degree to which respondents worry about the application of remediation options in their neighbourhoods.[128]

Good practice in resident engagement should therefore consider the gendered dimensions of worry when engaging with residents, given that different genders may have different concerns owing to the impacts that remediation activities are likely to have on their day-to-day lives.[129]

Image Source: William Dove/EPA

CHECKLIST S2

Does the plan identify and consider groups, organisations or other entities, ranging from local interest groups through to government agencies, that are affected by, or have an interest in, the site contamination and its management and remediation?

Existing guidance highlights the need for the plan to consider groups, organisations or other entities, ranging from local interest groups through to government agencies, that are affected by, or have an interest in, the site contamination and its management and remediation. These organisations may range from local community groups through to local, state or Commonwealth agencies with responsibility in the area of contamination.[130] It is important to understand that these organisations (e.g. an environmental protection interest group or a government authority) may also have an interest of their own in the political and technical aspects of the contaminated site.[131]

CHECKLIST S2

Organisation	Code	Existing guidance and evidence to support the plan's development	Questions to keep in mind as you develop your plan
Community services and facilities	S 2.1	**Community services and facilities:** When developing the plan, it is important to consider community facilities, such as childcare centres, schools, kindergartens, hospitals and nursing homes, that may be affected by, or have an interest in, the site contamination and its management and remediation.[132]	**Q** Does the plan make provision for community facilities and services that may are affected by, or have an interest in, the site contamination and its management and remediation?
Environment groups, special interest groups, committees and associations	S 2.2	**Environment groups and other associations:** When developing the plan, it is important to be aware of environment groups, special interest groups, and committees and associations that are affected by, or have an interest in, the site contamination and its management and remediation.[133] In order to ensure broad involvement, it is important to consider small, local groups as well as peak stakeholder organisations.[134]	**Q** Does the plan make provision for environment groups, special interest groups, committees and associations that are affected by, or have an interest in, the site contamination and its management and remediation?
	S 2.3	**Don't ignore the viewpoints of environmental groups and other associations:** Environment groups, special interest groups, and committees and associations may have a lot of knowledge and skills that are relevant to the contamination and that they are willing to share.[135] Whilst 'activists' within some of these organisations may sometimes be perceived as a threat to those managing site contamination, the advice and assistance offered by these organisations often helps local residents to understand the issues and frame their concerns in a meaningful way.[136]	**Q** Does the plan involve engagement activities that allow environment groups, special interest groups, committees and associations to share their knowledge and skills to inform understanding of the site contamination and its management and remediation?
Businesses and industry	S 2.4	**Businesses and industry:** When developing the plan, it is important to be aware of local businesses and industries not directly involved in the activities on the contaminated site that may be concerned about the site contamination, and how its remediation and management will affect their own business activities.[137]	**Q** Does the plan make provision for local businesses and industries that are affected by, or have an interest in, the site contamination and its management and remediation? ■ What are the effects on their business activities?
Local authorities	S 2.5	**Local authorities:** When developing the plan, it is important to be aware of the local authorities that are affected by, or have an interest in, the site contamination and its management and remediation.[138] A local authority may either be a proponent or a consent authority for contaminated land.[139]	**Q** Does the plan make provision for local councils that are affected by, or have an interest in, the site contamination and its management and remediation?

CHECKLIST S2 (continued)

Organisation	Code	Existing guidance and evidence to support the plan's development	Questions to keep in mind as you develop your plan
Local authorities	S 2.6	**Local authorities as consent authority:** When engaging with local government, understand whether they are a consent authority in the matter you are raising.[140]	**Q** Is local government a decision-making authority for the contaminated site and its management and remediation?
	S 2.7	**Utilise local authorities' connections with community:** No-one is better qualified to represent the local community than local government, because they are elected by and accountable to the local community.[141] Local government provides a single measurement of community opinion that is often impractical to gather from engagement with other interests. Input from local government can provide consensus and direction, which submissions from more focused interest groups cannot provide.[142]	**Q** Does the plan acknowledge the role that local councils can play in representing local communities? ■ Are local councils willing to assist with the plan's engagement activities with local residents, businesses and industries?
State and commonwealth government agencies	S 2.8	**State and commonwealth government:** When developing the plan it is important to be aware of government agencies, departments and authorities who may have statutory responsibilities associated with the site contamination and its management and remediation. For example, some will have responsibility for overall management of a remediation and management program, while others will have responsibility for a specific aspect of contaminated site activity such as public health or work health and safety.[143]	**Q** Does the plan make provision for state and Commonwealth government agencies that have statutory responsibilities associated with the site contamination and its management and remediation?
Media	S 2.9	**Be aware of media:** When developing the plan it is important to be aware of the media, and their coverage of the contaminated site.[144]	**Q** Does the plan make provision for media that may have an interest in the site, the contamination and its management and remediation? ■ Has someone carried out a review of current media reporting on the contaminated site?
	S 2.10	**Identify media liaison person:** It is sensible to nominate one person to liaise with the media and to act as the main point of contact. This helps to avoid conflicting or confused messages being disseminated.[145] A good working relationship with media personnel can provide the opportunity for information dissemination outlets to stakeholders.[146]	**Q** Does the plan nominate one person to liaise with the media, and act as the main point of contact?

CHECKLIST S2 (continued)

Organisation	Code	Existing guidance and evidence to support the plan's development	Questions to keep in mind as you develop your plan
Workers, unions and associations	S 2.11	**Workers, unions and associations:** When developing the plan, it is important to consider workers at the contaminated site and their unions and associations. They are generally concerned that adequate health protection measures are in place. Australian work health and safety laws require that workers be consulted about a health and safety matter when they are, or are likely to be, directly affected by that matter. This duty to consult is based on the recognition that worker input and participation improves decision-making about health and safety matters and assists in reducing work-related injuries and disease. Fulfilling these legal requirements may necessitate engagement with other business operators who also have work health and safety duties on the site. It is essential that planning for stakeholder engagement includes consideration of health and safety matters.1[147]	**Q** Does the plan make provision for workers, unions and associations that are affected by, or have an interest in, the site contamination and its management and remediation?
Stakeholders associated with contaminated site	S 2.12	**Stakeholders associated with the contaminated site:** The contaminated site my involve a number of stakeholders including owners[148], occupiers and the entity (notional owner) who is responsible for causing the contamination.[149] 'Occupier of land' means the person who has the management and control of the land.[150]	**Q** Does the plan have a clear understanding of those who own and occupy the contaminated site, and how they relate to the entity (notional owner) who is responsible for causing the contamination?
Remediation industry experts	S 2.13	**Remediation industry experts engaged with the site:** The remediation industry in NSW includes a number of professionals who are certified to carry out key reporting and investigation tasks associated with contaminated sites in NSW. These professionals include contaminated land consultants and site auditors. A contaminated land consultant is a person who is suitably qualified and experienced in contaminated land assessment and management. The EPA recognises two certification scheme for consultants to carry out key aspects of the investigation and management process at a contaminated site that is regulated by the EPA, such as site investigations, developing remediation planning and environment management planning, and site validation and notice of completion.[151] A site auditor is a person accredited by the NSW EPA under the CLM Act to conduct site audits of contaminated land.[152]	**Q** Does the plan have a clear understanding of those remediation professionals who have been tasked with compiling reports and carrying out investigations of the contaminated site?

CHECKLIST S3

Does the plan identify and consider residents and other stakeholders from culturally and linguistically diverse (CALD) backgrounds, including Indigenous people, who are affected by, or have an interest in, the site contamination and its management and remediation?

Existing guidance highlights the need for the plan to be tailored to stakeholders from culturally and linguistically diverse backgrounds[153], and in particular Indigenous stakeholders.[154] For example, research shows that residents who speak a language other than English are more likely to be worried about contamination in their neighbourhood[155], and the application of remediation solutions[156], and to perceive greater levels of risk to human health.

CHECKLIST S3

Stakeholder group	Code	Existing guidance and evidence to support the plan's development	Questions to keep in mind as you develop your plan
Indigenous people and communities	S 3.1	**Engagement needs of Indigenous peoples:** When developing the plan it is important to consider how Indigenous people and their communities are engaged.[157] It is important to establish contact early in the engagement processes with recognised Elders in the community.[158]	**Q** Do the stakeholders include Indigenous people and communities?
	S 3.2	**Identify who speaks for different country and sites:** There may be several Indigenous people within a particular community that speak for different country and sites, all of whom may need to be consulted. Be aware that within a region there may be a number of different communities.[159]	**Q** Have you engaged all the relevant Indigenous groups and their representatives with traditional links to, or interests in, the area? ■ Have you engaged with the recognised Elders in the community?
	S 3.3	**Acknowledge divergent viewpoints during engagement:** There may be conflict between different Indigenous groups that will require separate discussions to be factored into the engagement process. Different Aboriginal groups may have differing views regarding who should be engaged with about what and in what manner. There may be numerous competing claims about who the true custodians of sites are, and who has the right to speak for them. The cause of these conflicts and the various views should be documented.[160]	**Q** Have you considered that different Aboriginal groups may have differing views regarding who should be engaged with about what and in what manner?
	S 3.4	**Relevant government bodies and Land Councils:** Approach relevant bodies. For example, government departments with responsibility for Indigenous matters, Indigenous Land Councils, and local Indigenous groups, to determine the relevant communities' preferred approaches and the appropriate people to meet with initially.[161]	**Q** Have relevant government departments with responsibility for Aboriginal matters, Aboriginal Land Councils, and local Indigenous groups been engaged to determine the preferred approaches to engagement and the appropriate people to meet?
People from culturally and linguistically diverse (CALD) backgrounds	S 3.5	**Engagement needs of people from CALD backgrounds:** When developing the plan it is important to tailor it to people from CALD backgrounds. CALD backgrounds may extend beyond language and nationality to other factors such as religious beliefs.[162]	**Q** Do the stakeholders include people from CALD backgrounds? ■ Have you identified their CALD backgrounds?

CHECKLIST S3 (continued)

Stakeholder group	Code	Existing guidance and evidence to support the plan's development	Questions to keep in mind as you develop your plan
People from culturally and linguistically diverse (CALD) backgrounds	S 3.6	**Tailor engagement to cultural norms:** Researching and respecting the cultural norms that may be important when communicating with particular individuals and groups. For example, the use of eye contact, or appropriate dress.[163]	**Q** Have you considered cultural norms when communicating with different cultural groups?
	S 3.7	**Identify who represents specific CALD communities:** Who are the representatives of specific CALD communities who are able to speak for those communities? [164]	**Q** Have you engaged relevant representatives of CALD communities?
	S 3.8	**Involve CALD support organisations and agencies:** Consider whether organisations and agencies who work with people of CALD backgrounds could assist with your engagement. For example, local councils may have good contacts and networks with CALD communities in their areas.[165]	**Q** What organisations and agencies work with people of CALD backgrounds that you can draw on to assist with your engagement? ■ Have you drawn on local council contacts and networks with culturally and linguistically diverse communities in their area?

CHECKLIST S4

Does the plan identify and consider residents and other stakeholders who are living with chronic illness or disability who are affected by, or have an interest in, the site contamination and its management and remediation?

Related to : CASESTUDY 2

Existing guidance highlights the need for the plan to be tailored to stakeholders living with disabilities.[166] The evidence suggests that the plan should also consider stakeholders living with a chronic illness or disability are more likely to worry about contamination in their neighbourhood compared to those without.[167]

CHECKLIST S4

Condition	Code	Existing guidance and evidence to support the plan's development	Questions to keep in mind as you develop your plan
Chronic illness	**S 4.1**	**Stakeholders living with a chronic illness:** Tailor the engagement plan to the needs of stakeholders who are living with a chronic illness. Chronic illnesses are complex health conditions that occur across the life cycle, although they are more common in older age, and may affect quality of life and cause disability. More than 50% of Australians have a chronic illness. The most common forms of chronic illness in Australia are:[168] ▸ mental illness ▸ dementia (including Alzheimer's disease) ▸ arthritis ▸ asthma ▸ cancer ▸ diabetes ▸ cardiovascular disease. People with chronic illnesses are more likely to have difficultly accessing services, and to experience feelings of disempowerment, frustration and disengagement.[169] Australian research has shown that people living with a chronic illness are more likely to be worried about contamination in their neighbourhood compared to those without.[170]	**Q** Do stakeholders, particularly residents, include people who are living with a chronic illness? ■ Have you identified what chronic illnesses they are living with?
	S 4.2	**Organisations that support people living with a chronic illness:** Consider whether organisations and agencies who work with people with chronic illnesses could assist with your engagement plan.	**Q** What organisations and agencies work with people with chronic illnesses? ■ Which of these organisations can you draw on to assist with the plan's engagement activities?

Condition	Code	Existing guidance and evidence to support the plan's development	Questions to keep in mind as you develop your plan
Living with a disability	**S 4.3**	**Stakeholders living with a disability:** Tailor the engagement plan to the needs of stakeholders who are living with one or more form of disability. Some forms of disabilities are: ▸ intellectual disability, such as a person who has significantly below average intelligence (based on an IQ test), or who may have difficulty with everyday life skills ▸ physical disability, such as a person who uses a wheelchair or has difficulties with communication ▸ sensory disability, such as a person with hearing impairment, or someone who is blind or vision impaired ▸ psychiatric disability, such as a person who has a mental illness ▸ acquired brain injury, such as, a person who was not born with a disability, but acquired their disability (e.g. through a car accident or drug abuse) ▸ neurological impairment, such as a person who has a degenerative condition such as multiple sclerosis, Huntington's Disease or motor neurone disease.[171] Australian research has shown that residents living with a disability are more likely to be worried about contamination in their neighbourhood compared to those without.[172]	**Q** Do stakeholders, in particular residents, include people who are living with a disability? ■ Have you identified what disabilities they are living with?
	S 4.4	Consider whether organisations and agencies who work with people living with disabilities could assist with your engagement plan.[173]	**Q** What organisations and agencies work with people living with disabilities? ■ Which of these organisations can you draw on to assist with the plan's engagement activities?

CASESTUDY 2

Focused and sustained engagement on the health concerns of people living with a disability at Rhodes Peninsula: An example of good practice in resident engagement

CONTEXT

Timeframe	1980–2014
Site	Rhodes Peninsula
Contaminant(s)	Mix of chemicals, pesticides, herbicides, lead and dioxin
Selected remediation option	Mix of excavation and off-site disposal, and on-site capping and containment
Issue	Disability and worry about the human health impacts of contamination and remediation options
Related checklist	**Checklist S4** Does the plan identify and consider residents and other stakeholders who are living with chronic illness or disability who are affected by, or have an interest in, the site contamination and its management and remediation?

LESSONS LEARNED

- Sociodemographic factors, including disability, can influence worry about the human health impacts associated with contamination and the use of remediation options.
- Sustained and committed engagement over the course of the entire remediation process helps to engage people from more vulnerable and often harder to reach population groups, including people living with a disability.
- Good practice involves adopting a variety of stakeholder engagement methods and efforts to address the particular concerns of vulnerable groups in order to lessen residents' worries and enhance levels of trust between members of the public and members of official organisations involved in remediation activities.

Situation

Rhodes Peninsula was an industrial chemical manufacturing site for nearly 60 years until 1985.[174] During this period of heavy industrial production, a broad range of contaminants were left at the site, including pesticides, herbicides, lead and dioxin.[175] Awareness of contamination at Rhodes Peninsula grew steadily from the early 1960s as growing public awareness of pollution and its impacts on human and environmental health began to take hold. Concern intensified during the 1980s in the wake of the Bhopal disaster in India, where a Union Carbide industrial accident resulted in the death of 10,000 people and left thousands more with serious injuries. In 1985, Union Carbide production shut down at the Rhodes Precinct and the site was demolished. Investigations began in 1987, and in 1988 Union Carbide was issued with a notice to remediate the site under the Environmentally Hazardous Chemicals Act (EHC Act).

Actions Taken

Between 1988 and 1993, the site was excavated and some material was removed and taken to landfill. On-site cells were decontaminated, contained and capped, however these were deemed to have not been completed to a satisfactory residential standard. Thus, in 2001, the NSW Upper House Legislative Council Standing Committee on State Development called for an inquiry. In 2002, a State Government report was published which made 33 recommendations for improving remediation activities at the site. A year later, a Parliamentary Commission of Inquiry was launched into the remediation

proposal. New remediation activities commenced in 2005. By 2009 remediation lots were certified as suitable for residential zoning by an independent auditor.[176, 177] Remediation activity was completed in 2014.

Community members living near Rhodes Peninsula were particularly concerned about the plans to remediate the site for residential occupation. A predominant concern was that exposure to dioxin and other pollutants released into the air during remediation activities could result in an increased incidence of cancer for people living in the area.

Theiss Services, who were responsible for undertaking the remediation, liaised extensively with members of the Rhodes Community Consultative Committee throughout the process by holding monthly meetings for five years, providing quarterly newsletters, organising site visits, and giving presentations to the community.[178] NSW Health was also involved in communicating with the community about the remediation and sent a newsletter to the community explaining the project, the contamination and the involvement of NSW Health. It also provided contact details for the project, local community groups and public health services.[179] Council staff, who often provided the first point of contact for community members who had questions about the remediation, attended the monthly Theiss-run Rhodes Community Consultative Committee meetings, which dealt specifically with remediation. Developers and other stakeholders also attended these meetings and residents were provided with opportunities to ask questions about remediation.[180]

A study was also conducted in 2004 to assess whether there was any difference in the historical incidence of cancer and cancer mortalities at the site compared to other areas in NSW.[181] This study concluded that there was no evidence to suggest that dioxin from the site resulted in increased cancer rates in the potentially exposed population in the area.[182]

Outcomes

At Rhodes Peninsula, the extensive communication and resident engagement activities undertaken by remediation professionals, NSW Health and local government helped to establish trust between members of the public, including those from vulnerable and more difficult to reach population groups such as those living with a disability or existing chronic health conditions, and members of official organisations.

The consistency of frequent communication and opportunities for engagement throughout the remediation process enhanced trust between community members and institutions as it provided reassurance that official institutions were

serious in their commitment to providing ongoing opportunities for residents to come forward and share their concerns. Public media reports released in 2017 discussing the history of the Rhodes Peninsula site remediation highlighted the extent to which enhanced communication during the redevelopment helped to lessen residents' worry levels. People who had once kept their windows closed for fear of breathing in harmful particles now feel comfortable walking in areas that had been previously identified as contaminated.[183]

Effort to address the concerns of people living near the area also helped to alleviate residents' worries as well as improve trust between members of vulnerable population groups, including people living with disabilities, and members of official organisations involved in the remediation process.

Conclusion and Recommendations

Extensive communication of the study findings helped to increase residents' awareness of the findings from the NSW Health 2004 study and helped to ease concerns about the health impacts associated with contamination and remediation at the Rhodes Peninsula redevelopment site in New South Wales. By undertaking the study to address residents' concerns, NSW Health were able to demonstrate to residents that health authorities were taking their concerns, including the concerns of the most vulnerable residents, seriously.[184]

Previous research has shown that people living with disabilities and chronic health conditions are often more likely than other members of the population to demonstrate high levels of worry about the presence of contamination in nearby residential areas, in particular they are more likely to demonstrate higher levels of worry about the human health impacts associated with this contamination.[185] Furthermore, people living with a disability may also be more distrustful of information disseminated by official organisations, and it is only in the last 10–15 years that environmental hazard management models have specifically considered the needs of people with disabilities.[186, 187, 188] However, by making a sustained effort to reach out to the community and by specifically tailoring engagement approaches to address the needs and concerns of particular population groups including those living with a disability, organisations involved in remediation activities can help to reduce residents' worries.

STEP 3

Identify the effects of the contaminated site and the contamination on residents and other stakeholders

IN THIS SECTION

STEP 3

Identify the effect of the contaminated site and contamination on residents and other stakeholders

➨ Introduction

Step 3 of the guide is designed to help the user identify the effects of the contaminated site and the contamination on residents and other stakeholders.

To develop an engagement plan, the user needs to understand the ways in which residents and other stakeholders are affected by the activities occurring on a contaminated site, and the contaminant. Determining the extent of engagement for different residents and other stakeholders depends upon the nature and impact of the contaminants and the proximity of the local community to the site, including whether activities are likely to affect amenity or give rise to nuisance conditions such as high levels of noise or odour. The extent of engagement will also be affected by whether the site, locality or contaminant has a history of controversy. As a general rule, if the contamination has a significant impact on residents, more extensive engagement is expected.[189]

Step 3 contains three checklists which will help the user address three key questions. We first provide the three key questions that guide the three checklists in this step, and then present the checklists. The letter "**C**" in used to identify the checklists in Step 3, and is a reference to the step's focus on the **C**ontamination and the **C**ontaminated site. The checklists within this step present existing evidence[190] and guidance[191] and associated questions to help the user identify and consider the effects of the contaminated site and the contamination on residents and other stakeholders.

➨ Key Questions

Does the plan:

consider engagement during the investigation of the site's contamination, and does it consider the role of residents and other stakeholders during the investigation stage?

consider the effect of the contaminated site on residents and other stakeholders?

consider the effect of the contamination on residents and other stakeholders?

CHECKLIST C1

Does the plan consider engagement during the investigation of the site's contamination, and does it consider the role of residents and other stakeholders during the investigation stage?

The engagement plan should include a description of any existing understanding of the investigation of the contaminated sites in order to provide context for the stakeholder engagement process. Development of a stakeholder engagement plan requires a clear understanding of how affected and interested stakeholders will be engaged with during different stages of the site's investigation. The aim of site investigation is to understand the existence, nature and extent of contamination of the land[192] so that appropriate risk management responses can be developed for potential health or environmental hazards.[193]

In the NSW context a site investigation process is used to determine if the site is, or may be, contaminated. Key stages in the site investigation process may include:

- a preliminary site investigation
- an initial evaluation
- a detailed site investigation
- the development of a conceptual site model
- an audit of site investigations.

It is important to note that the scope of the investigation of the contamination at a site may change over time; for example, a previously unknown contaminant might be found at the site, so the engagement plan may need to be adapted.

CHECKLIST : C1

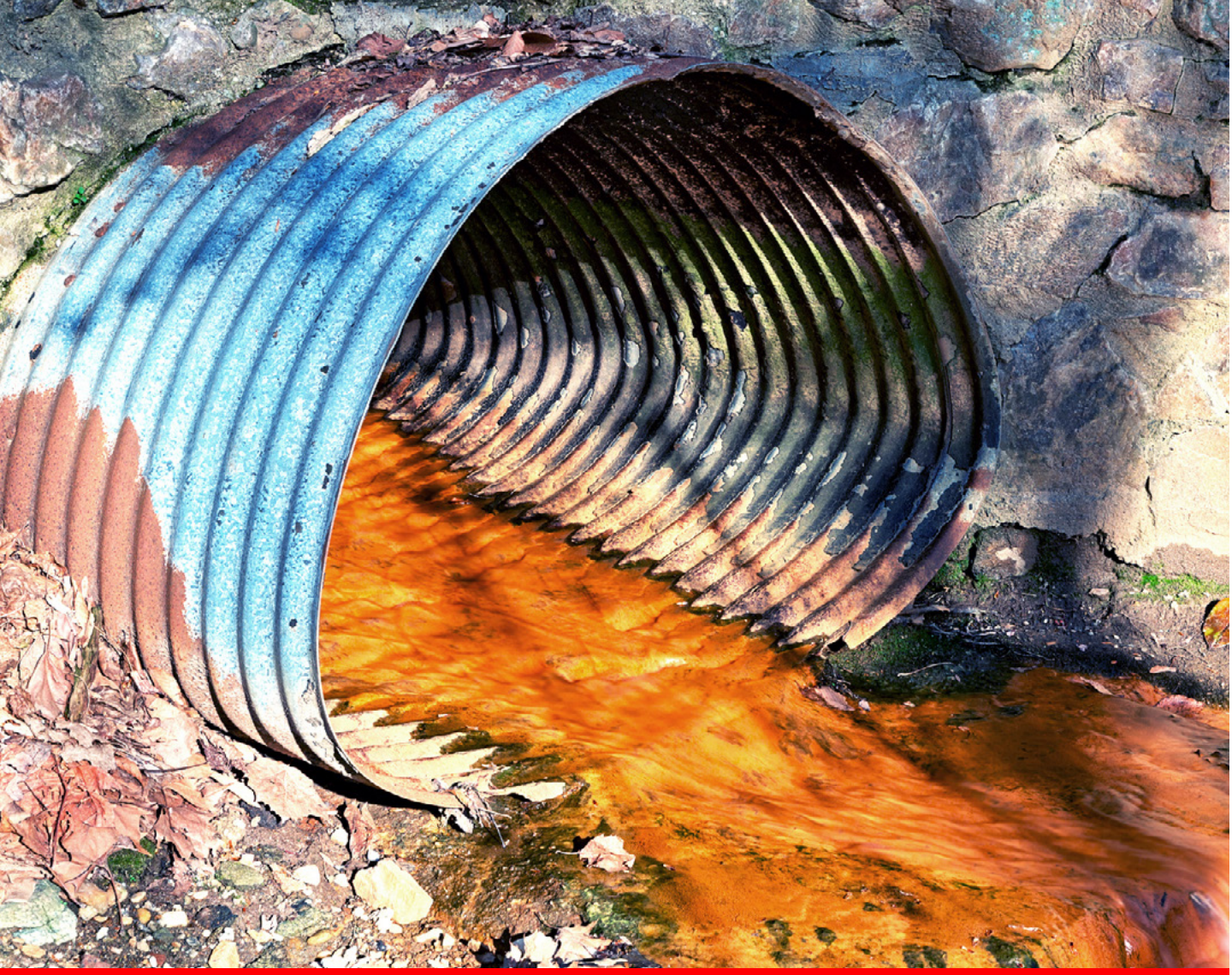
Site Investigation	Code	Existing guidance and evidence to support the plan's development	Questions to consider as you develop your plan
Site investigation	C1.1	**Site investigation:** A site investigation process is used to determine if the site is, or may be, contaminated.[194]	**Q** Has a site investigation process commenced or been completed for the site, to determine if the site is, or may be, contaminated?
	C1.2	**Preliminary site investigation:** The purpose of the preliminary site investigation is to identify any past or present potentially contaminating uses or activities, and to provide a preliminary assessment of the extent and nature of site contamination if it exists. It typically includes a detailed appraisal of the site history and may include some initial site sampling. In the NSW context a preliminary site investigation report should be undertaken or approved by a certified contaminated land consultant.[195]	**Q** Has a preliminary investigation been carried out for the site, or is one currently being carried out? ■ Does the engagement plan include a description of the key findings from the preliminary site investigation? ■ Who was the certified contaminated land consultant who undertook/is undertaking the preliminary site investigation? ■ Who currently has access to the preliminary site investigation?
	C1.3	**Detailed site investigation:** A detailed site investigation must be carried out to determine the extent and degree of contamination, to assess potential risks posed by contaminants to health and the environment, and to obtain sufficient information for the development of a remediation plan. A detailed site investigation is required if the results of the preliminary site investigation indicate that contamination is present, or is likely to be present, and the information available is insufficient for consent authorities to make decisions or to allow site management strategies to be devised. In the NSW context a detailed site investigation should be undertaken or approved by a certified contaminated land consultant.[196]	**Q** Has a preliminary investigation been carried out for the site, or is one currently being carried out? Does the engagement plan include a description of the key findings from the detailed site investigation? ■ Who was the certified contaminated land consultant who undertook/is undertaking the detailed site investigation? ■ Who currently has access to the detailed site investigation?

CHECKLIST : C1 (continued)

Site Investigation	Code	Existing guidance and evidence to support the plan's development	Questions to consider as you develop your plan
Site investigation	**C1.4**	**Initial evaluation:** During the investigation of a contaminated site, the consent authority (e.g. council or planning authority) may undertake an initial evaluation of readily available factual information[197] to determine whether contamination is an issue, or whether further information is needed to make such a determination, and how that contamination might affect any proposed or current use at the site.[198] Types of factual information that the initial evaluation may consider include: knowledge of contamination of nearby land, and any previous investigations for contamination or remediation of the site (e.g. previous preliminary site investigation, a detailed site investigation, a validation of remediation works or a site audit statement).[199]	**Q** Has a consent authority carried out an initial evaluation of the likelihood that the site is contaminated? ■ Who is that consent authority (e.g. NSW EPA, planning authority or local council)? ■ What were the findings from the initial evaluation? ■ Does the initial evaluation indicate that contamination of nearby land is present, or that the site has been previously investigated for contamination or to determine whether it has been remediated? ■ Does the initial evaluation indicate the need for further information before a decision can be made about whether the site is contaminated?
	C1.5	**Conceptual site model (CSM):** The CSM identifies risks to human health and the environment, and uncertainties in the available information that need to be addressed through further assessment. The CSM is refined until there is sufficient information and understanding of the site to propose an approach to remediating the land or an approach to managing identified risks.[200] Stakeholder perceptions of risk may differ from those identified through the development of the CSM, which provides the framework for identifying how the site became contaminated and how exposure to contamination may occur in the present or the future.[201]	**Q** Has a conceptual site model been created for the contamination at the site? ■ What is the most recent conceptual site model, and how does it relate to the stakeholders' risk perceptions?

CHECKLIST : C1 (continued)

Site Investigation	Code	Existing guidance and evidence to support the plan's development	Questions to consider as you develop your plan
Audit	**C1.6**	**Audit of site investigations:** In some circumstances, a consent authority may decide to engage another certified contaminated land consultant, or an accredited site auditor, to independently review the site investigations that have been carried out for a contaminated site.[202] An independent review may be necessary when: the consent authority believes on reasonable grounds that the information provided by an applicant is incorrect or incomplete; the contamination and/or remediation issues are complex and the planning authority does not have the internal resources to conduct its own technical review; and when the consent authority requires additional confirmation that a site can be made suitable for a particular use or uses if remediated in accordance with a remediation plan.[203] In some circumstances, a site audit may be required by law.[204]	**Q** Is an audit of site investigations being (or has it been) carried out for the site? ■ What is the purpose of the site audit (e.g. Is it a statutory site audit)? ■ If a site audit has been carried out, what did it conclude? ■ Who is the certified contaminated land consultant or auditor who undertook/is carrying out the site audit?
Legacy	**C1.7**	**Maintain records on land contamination:** A key expectation of NSW contaminated land policy and legislation is that authorities will maintain records on land contamination to provide the community with information and support future decisions.[205] The consent authority should ensure that information about contaminated land is provided to stakeholders and the community, especially potential purchasers and occupiers of land, in a fair and equitable manner.[206] All records should include the source of the information, its date and the purpose for which it was collected.[207]	**Q** Does the plan acknowledge that authorities will keep records on the impact of the contamination on property titles, and how this is communicated to stakeholders?



CHECKLIST C2 Does the plan consider the effect of the contaminated site on residents and other stakeholders?

Related to : CASESTUDY 3

When creating an engagement plan for a contaminated site it is important to consider how residents and other stakeholders are affected by the contaminated site(s). Determining the extent of engagement for different residents and other stakeholders depends upon their proximity to the site, and whether the site, locality or contaminant has a history of controversy. Australian research has highlighted that a resident's proximity to a contaminated site influences their level of worry about the contamination.[208]

CHECKLIST : C2

Site characteristics	Code	Existing guidance and evidence to support the plan's development	Questions to consider as you develop your plan
Proximity of site	**C2.1**	**Proximity of residential areas:** The proximity of residential areas to the site is likely to affect the extent of engagement. An Australian study found that residents who lived closer to the contaminated site worried more about the contamination[209] than those living further away. Residents also worried that health effects may be amplified by a closer proximity to the contaminated site.[210] In contrast, another study found no association between the distance from the source site and level of worry about the contamination.[211]	**Q** How will you manage residents' levels of worry about their proximity to the contaminated site, and the worries they may have about the effect this will have on their health and others' health?
	C2.2	**Proximity of sensitive human receptors:** The proximity of the contaminated site to sensitive receptors and/or vulnerable sub-populations, such as childcare centres, schools, kindergartens, hospitals and nursing homes, it likely to affect the extent of engagement.[212]	**Q** Have you considered if the contaminated site is near to sensitive human receptors? ■ How will you manage residents' and other stakeholders' concerns about the proximity of the contaminated site to these receptors?
	C2.3	**Proximity of sensitive ecological receptors:** The proximity of the contaminated site to sensitive ecological receptors[213] such as rivers, drinking water bores, catchment areas, and areas with recognised environmental significance (e.g. National Parks) is likely to affect the extent of engagement.	**Q** Have you considered whether the contaminated site is near to sensitive ecological receptors? ■ How will you manage residents' and other stakeholders' concerns about the proximity of the contaminated site to these receptors?
	C2.4	**Proximity of businesses and industries:** The proximity of the contaminated site to businesses and industries is likely to affect extent of engagement.[214]	**Q** Have you considered whether the contaminated site is near businesses and industries? ■ How will you manage concerns about the impact the site will have on business activity?
History of site	**C2.5**	**Possibility that site has a contentious history:** The extent to which the contaminated site has a controversial history that may be related to the site contamination is likely to affect the scale of engagement.[215]	**Q** Have you considered whether the contaminated site or locality has a controversial history that is related to the site contamination?

CHECKLIST : C2 (continued)

Site characteristics	Code	Existing guidance and evidence to support the plan's development	Questions to consider as you develop your plan
History of site	**C2.6**	**Contentious industry at site:** The contentious nature of the industry or activity at the contaminated site may affect the extent of engagement.[216]	**Q** Have you considered whether the type of industry or activity at the contaminated site is contentious?
	C2.7	**Contentious development of site:** The extent to which the contaminated site forms part of a high-profile or controversial development in the local area may affect the extent of the engagement. The development of the site may be controversial for political, economic or social reasons.[217]	**Q** Have you considered whether the contaminated site forms part of a high-profile or controversial development in the local area?
	C2.8	**Site's cultural and spiritual significance**: The extent to which the contaminated site has cultural and spiritual significance may influence the extent of engagement. Due regard should be given to sites of cultural and spiritual significance, in particular, the significance that Indigenous people attach to that land.[218]	**Q** Have you considered whether the contaminated site forms part of a high-profile or controversial development in the local area?
	C2.9	**Document the site's history:** Record the history of the site, including the history of its: zoning, land-use, users, possible contaminant sources, complaint history. Also collect information on adjacent land, and local usage of ground/surface waters and location of bores/pumps.[219]	**Q** Have you considered the history of the site, including its zoning, land-use, users, possible contaminant sources, complaint history? ■ Have you collected information on adjacent land, and local usage of ground/surface waters and location of bores/pumps?
Awareness of site	**C2.10**	**Communities' awareness of site:** Nearby communities' awareness of the contaminated site, the visibility of the contaminated site to the surrounding community, and the size of the source site may affect the extent of engagement. For example, has the site been the focus of media attention?	**Q** Have you considered how visible the contaminated site is to the surrounding community and how the scale of the site may affect the extent of engagement?

CASESTUDY 3

Mitigating residents' worries about the impacts of contamination: Learning lessons from the history of two sites in New South Wales

CONTEXT

Timeframe	2001 to present day
Site	Nelson Parade, Hunters Hill and former HMAS Platypus site, Neutral Bay
Contaminant(s)	Chemical, radiological, solvents and heavy metals
Selected remediation option	Removal and disposal
Issue	Residents' worries about impacts of a remediation option are influenced by proximity to site, with residents living nearer the site being more likely to worry about the potential health impacts, as well as impacts on day-to-day life.
Related checklist	**Checklist C2** Does the plan consider the effect of the contaminated site on residents and other stakeholders?

LESSONS LEARNED

- **Varied and regular communication about the health risks of the contamination and remediation can help people to feel more in control over the situation.**
- **Good practice involves addressing residents' worries about the health risks associated with particular remediation options.**
- **Working with residents to find solutions to minimise the disruptive impacts of remediation options can help to alleviate residents' worries.**
- **Using appropriate remediation options, like odour tents, can help to minimise impacts on residents living in close proximity to the site.**

Introduction

Studies on the impacts of environmental contamination and remediation of contaminated lands have shown that people living in or near contaminated sites are required to navigate a range of complex issues in their daily lives, including having reduced access to neighbourhood spaces and increased worry about the health impacts of exposure to contaminants during remediation works.[221, 222, 223, 224] Those living in closest proximity to the contamination may be more likely to worry than those living further away.[225] The two examples discussed below highlight the need for decision-makers to consider the effect of the contaminated site on residents and other stakeholders.

EXAMPLE 1: NELSON PARADE, HUNTERS HILL

Situation

Contamination at Nelson Parade, Hunters Hill occurred from two separate activities: (1) nineteenth century coal tar distillation, which is present in the foreshore area, and (2) the extraction of radium from uranium ore, which occurred between 1900 and 1915. These industrial activities resulted in chemical contamination in the foreshore area including lead,

arsenic, total petroleum hydrocarbons (TPH) and polycyclic aromatic hydrocarbons (PAHs) and radiological contamination where uranium processing occurred. The radiological contaminant is not considered a 'radioactive substance' as it does not meet the definition of a radioactive substance provided in clause 5 of the NSW Radiation Control Regulation 2003, as it has a specific activity of less than 100 Bq/g.

Development and landscaping of the former industrial site in the 1960s and 1970s led to some radiological contamination above background levels being relocated to other areas on Nelson Parade.[226] In 2007, the foreshore area of 7 to 11 Nelson Parade was declared a remediation site under the Contaminated Land Management Act of 1997 (CLM) because :

- **Coal tar pitch is present at the soil surface and is likely to be mobilised in hot weather.**
- **PAHs, arsenic and lead are present in the soil at the site in concentrations significantly exceeding the relevant Health Investigation Levels for both its current zoning as residential land and its proposed use as open space. TPHs in the soil at the site is also present in concentrations exceeding the relevant guideline levels.**

Actions Taken

The NSW EPA is regulating the coal tar contamination at the foreshore area. The owner of the land has committed to the remediation of the residual radiological contamination at 7 to 11 Nelson Parade concurrently with the remediation of the regulated chemical contamination of the foreshore. They will also remediate soil from surrounding land that was identified to have above background levels of radiological contamination during the remediation project.

The proposed remediation was to remove all contaminated soils from the site for disposal at a licensed facility; however, 10 years after declaring the remediation site, remediation had not yet been undertaken at the site. Residents living near the site had concerns about the long-term risk of developing cancer, particularly as a number of former residents had developed non-hereditary cancers.[227] Although the reasons for the development of cancer are complex and cannot be directly attributed to the contamination, it is the lack of certainty about the long-term health impacts that was particularly worrying for residents.[228]

Outcomes

The properties at 7, 9 and 11 Nelson Parade were purchased from the owners by the NSW Government and the houses were demolished. The Australia's Nuclear Science and Technology Organisation, which has expertise in radiological contamination, tested the properties. Property NSW, as the owner of 7, 9 and 11 Nelson Parade, has held meetings with stakeholders annually, and has held regular meetings with the council and residents and has distributed community newsletters about the contamination and proposed remediation to help keep residents updated.[229, 230] Community members and other stakeholders were invited to have their say on remediation decision-making. Project information was provided online and via telephone, which enabled residents to seek out information of their own accord. This helped to alleviate residents' worries about the contamination, particularly among those living in closest proximity to the site.

Evaluation

The authorities can be considered to have responded well to resident concerns during the decision-making stages, as they considered the proximity of the site to local residents and to Sydney Harbour, and to the Parramatta River where people swim and fish. Some residents have expressed anger at the delay in starting the remediation processes. While the EPA's response has helped to alleviate a degree of resident worry, with continuing ongoing delays to the start of the remediation process, it is vital that residents continue to be provided with regular updates and opportunities to voice their concerns to prevent worry and erosion of trust between the residents, government institutions and industry.

EXAMPLE 2: HMAS PLATYPUS SITE, NEUTRAL BAY

Situation

The former HMAS Platypus site was a gas works (1876 onwards), a naval base providing torpedo maintenance facilities (1942 onwards), and then became the HMAS Platypus submarine base (1967-1999). Significant contamination existed at the site[231] that included poly aromatic hydrocarbons, petroleum hydrocarbons, phenols, mono aromatic hydrocarbons, heavy metals, ammonia, total cyanides and soluble sulphates. Off-site migration of contamination to the waters of Neutral Bay also occurred, with contamination of soil, fill, groundwater, surface waters and soil gases over the entire site.[232]

Actions taken

In 2001, the NSW Department of Environment and Conservation (DEC) declared the site to be a remediation site. The DEC also labelled an area of the bay adjacent to the site and some of the properties off Adderstone Avenue to be an investigation area as contamination in these places may present a significant risk of harm to humans or the environment. In 2001, the Parliamentary Standing Committee on Public Works (Cth) recommended various forms of communication about the site, including establishing a website and a complaints–response mechanism. The Harbour Trust asserted that it would undertake public consultation in the lead-up to and throughout the remediation process, and would consider resident concerns about potential dust generation, traffic, noise and lighting.

The Trust consulted with the community throughout the processes of remediation and sought community input through a variety of channels including site tours to see the selected remediation option in action, a remediation project open day, regular information sessions, placing the Harbour Trust Community Advisory Committee (CAC) meeting minutes online, distributing newsletters to local households, and providing a six-week long public exhibition of the draft plans.

Outcomes

Three actions were taken to reduce the impact of remediation activities on residents living nearby. First, they responded to resident requests to restrict hours of demolition and crushing onsite in order to manage noise by delaying the start time for demolishing until 7.30 am on weekdays and 8 am on Saturdays. Second, they decided to undertake crushing at the former Retort House, located further away from residential areas, as a further noise mitigation measure. Third, they carried out all works in strict accordance with the DEC environmental control guidelines and requirements, which are set to ensure the maintenance of public health. This addressed resident concerns about odour and the risks of the contaminants becoming airborne. An 'odour tent' consisting of a sealed enclosure was used, and all the air discharged from the enclosure was required to meet established health guidelines. All hazardous materials leaving the site were contained in sealed vehicles or containers.[233, 234]

Evaluation

The Trust can be said to have undertaken exemplary consultation with the community throughout the process of

remediation. They also demonstrated awareness that those living closest to the site were more likely to have greater levels of worry about the impact of remediation activities on their daily lives than those living further away. This shows that good practice involves working with residents in order to find solutions to minimise the disruptive impacts of remediation options, and this can help to alleviate residents' worries

Overall conclusions and recommendations

The two examples above show that effective and regular communication about the health risks and impacts on residents' day-to-day lives can help residents to feel more in control. This can help to minimise the worry and disruption to the lives of residents affected by the contamination and remediation. These examples highlight the need for decision-makers to consider the effect of the contaminated site on residents and other stakeholders. Good practice involves addressing residents' worries about the health risks associated with particular remediation options, working with the residents to minimise the disruptive impacts of remediation options, and using appropriate remediation options where possible to help minimise the impacts of remediation on residents, particularly those living in closest proximity to the site.

CHECKLIST C3 Does the plan consider the effect of the contamination on residents and other stakeholders?

When developing an engagement plan for a contaminated site it is important to consider the effect of the contamination on residents and other stakeholders. Determining the extent of engagement for different stakeholders depends upon the type of contaminant, including whether the contaminant poses a significant risk to human health or the environment, and whether it is likely to affect local amenities (e.g. property prices) or give rise to nuisance conditions such as odour.[235] Furthermore, the engagement plan will need to reveal how the contaminant and its risk is perceived and experienced in different ways by individuals, groups and businesses.[236] Australian research has highlighted that a resident's sense of place[237] and knowledge of the contamination[238] may affect their level of worry about the contamination.

Within this checklist we note where different forms of engagement with stakeholders may be needed based on NSW legislation and guidance. For example, in some situations in NSW, more extensive stakeholder engagement may be required for sites that pose an environmental or human health risk, and where the contamination has the potential to move off-site or affect off-site receptors. Stakeholder engagement may not be required for sites distant from sensitive receptors where risks to the environment and human health are minimal.[239]

CHECKLIST : C3

Contaminant characteristic	Code	Existing guidance and evidence to support the plan's development	Questions to consider as you develop your plan
Multidimensional nature of contaminant risk	C3.1	**Stakeholders' risk perceptions:** The findings of professional risk assessment of the contaminated site, and also an understanding of how residents and other stakeholders perceive the risk from the contaminated site, will affect the extent of engagement. What a professional may scientifically constitute a 'negligible risk' can still give rise to anger and resentment among residents and other stakeholders associated with a particular contaminated site. People see risk as multidimensional and not as being represented by a numerical value alone. They judge risk according to its perceived or experienced characteristics and context.[240] Furthermore, a contaminant's risk perception is influenced by age, gender and education, as well as other factors including ethnicity and cultural background.[241]	**Q** Have you considered the findings from existing professional risk assessments of the contaminated site in the plan? ■ Does the plan provide for engagement activities that will enable residents and other stakeholders to discuss their perceptions of the risks associated with the contaminated site?
	C3.2	**Gender:** It is important to be aware of the effect that a person's gender can have on their level of worry.[242] Gender has been found to influence how residents perceive and experience the contamination. Female residents are more likely than male residents to be worried about the contamination in their neighbourhood.[243]	**Q** Does the plan make provision for residents and other stakeholders of different genders, given that they may have different experiences of the contaminant?
	C3.3	**Younger residents:** It is important to be aware of how young residents may experience the contamination.[244] Younger (35 and under) people are less likely to be worried about the contamination present in their neighbourhood compared to people between 36 and 74 years of age.[245 246]	**Q** Do the residents and other stakeholders include younger people? ■ Does the plan acknowledge that they might experience the contamination differently to people of other ages?
	C3.4	**Older residents:** It is important to be aware of how older people may experience the contamination.[247] Older (75 years +) residents are less likely to be worried about the contamination present in their neighbourhood compared to people between 36 and 74 years of age.[248]	**Q** Do the residents and other stakeholders include older people? ■ Does the plan acknowledge that they might experience the contamination differently to people of other ages?

CHECKLIST : C3 (continued)

Contaminant characteristic	Code	Existing guidance and evidence to support the plan's development	Questions to consider as you develop your plan
Multidimensional nature of contaminant risk	**C3.5**	**Households with children:** It is important to consider how having children living in a household influences residents' levels of worry about contamination. Having children living at home has been found to influence the degree to which residents are worried about a contaminant. Residents who have children in the household are more likely to be concerned about the contamination.[249] Whilst contaminant risks likely to affect children and pregnant women tend to arouse heightened levels of worry[250], concerns about contaminant risk tend to be lessened when the risk only affects adults.[251]	**Q** Do residents live in households with children? ■ Does the plan consider that having children in their household may affect a resident's level of worry about the contaminants?
	C3.6	**Household income:** Household income level has been found to influence the degree to which people are concerned about the contaminant. People earning incomes in the lowest bracket ($0-$40k annual household income) are likely to be more worried about contamination[252]	**Q** Does the plan consider the socioeconomic status of the residents' households in the vicinity of the site?
	C3.7	**Household tenure:** The type of household tenure – ownership or rental – influences a residents' levels of worry for the contaminant. Residents who own or are purchasing a home in a neighbourhood affected by contamination are less likely to worry about contamination present[253] compared to those who do not own their home.	**Q** Does the plan consider the household tenure of residents, and how this influences a resident's level of worry about the contaminants?
	C3.8	**Origin of the contamination:** The origin of the contamination may affect the stakeholder's level of worry. The contaminant may be classified as natural or anthropogenic (man-made). Man-made contaminant risks tend to arouse heightened levels of concern; in contrast, concerns about contaminant risk tend to be lessened when it has a natural origin.[254]	**Q** Does the plan consider the origin of the contamination and how this affects the stakeholder's level of worry about the contaminants?

CHECKLIST : C3 (continued)

Contaminant characteristic	Code	Existing guidance and evidence to support the plan's development	Questions to consider as you develop your plan
Awareness of contamination	**C3.9**	**Stakeholder awareness of the contamination:** Residents' and other stakeholders' awareness of the contamination may influence how they are engaged with.[255] Australian research highlights that residentswhen residents are informed about the presence of a contaminant in their neighbourhood, those who are aware of the contaminant are less likely to be worried than residents who were not aware of the contaminant isbeing present.[256]	**Q** Does the plan gauge how aware the local community is of the contamination?
	C3.10	**Stakeholder awareness of contamination through media:** Nearby communities' awareness of the contaminant at the site through following reports in the media may affect the engagement.[257] Risks subject to media attention tend to arouse heightened levels of concern.[258]	**Q** Does the plan consider how visible the contaminant is in the media, and how this may affect the community's concern?
Contaminant type and quantity	**C3.11**	**Contaminant type and concentration:** Contamination in the NSW context means the presentation of a concentration of a substance at a level that is above the concentration at which the substance is normally present in the same locality and that presents a risk of harm to human health or any other aspect of the environment.[259] The types of substances contaminating the site may affect the engagement. Australian research found that type of contaminant present can influence a resident's level of concern about contamination. The types of contaminants that residents are concerned about can vary depending on the community characteristics. One study found residents were less likely to worry about waste, asbestos and hydrocarbons compared to heavy metals.[260] However, another study found residents are more likely to worry about hydrocarbons, heavy metals and chlorinated solvents than asbestos.[261] Residents describe being less concerned about asbestos as there is an understanding of how to manage this contaminant type, and this reduces their concerns about health risk.[262] The extent of engagement may be affected by the contentious/ controversial nature of the type of a contaminant.[263]	**Q** Does the plan consider how the contaminant type might affect the extent of engagement? ■ Has the plan considered whether the contaminant type is controversial?

CHECKLIST : C3 (continued)

Contaminant characteristic	Code	Existing guidance and evidence to support the plan's development	Questions to consider as you develop your plan
Contaminant type and quantity	**C3.12**	**Toxic, persistent or bioaccumulative contaminants:** Are the substance(s) contaminating the site believed to be toxic, persistent or bioaccumulative, or are they present in large quantities or high concentrations or do they occur in combinations?[264]	**Q** Have you considered whether the substance(s) contaminating the site are believed to be toxic, persistent or bioaccumulative, or are they present in large quantities or high concentrations or do they occur in combinations? *Note: If the answer is yes, regulatory provisions of the CLM Act may be enacted, affecting the scale of engagement required.*
Contaminant's duration	**C3.13**	**Contaminant's duration:** What is the likely duration of the contamination(s) at the site? Some contaminants may be short term, whilst others may be long term. The intergenerational effect within a given community can be a difficult issue to grapple with when developing a stakeholder engagement plan.	**Q** Who are the stakeholders that are likely to be affected by the contamination and its remediation over time? ■ Has consideration been given to the intergenerational effect of the contaminant on residents and other stakeholders?
Location of contamination	**C3.14**	**Location of the contaminant over time:** The agreed location of the contamination may change over time as factual information arises about the scope and scale of the contamination at the site.[265] The agreed location of the site's contamination will be assessed and revised throughout the investigation process as more detailed information on the site and the nature of contamination becomes available.	**Q** Are the stakeholders aware of the location of the contamination? ■ Does the plan make provision for updating stakeholders about the location of the contamination as more detailed information on the site and the nature of contamination becomes available?
	C3.15	**Contaminant is within or beyond the sites boundaries:** Consideration needs to be given to understanding the geographical area in which the contaminant(s) is located[266] and who is located within this area.[267] For example, is the contaminant within the boundaries of the contaminated site, or has the contamination moved off-site (e.g. in a contaminated groundwater plume)[268] and what is the anticipated location of the contamination over time?	**Q** Where is the location of the substance(s) that are contaminating the site? ■ Which residents and other stakeholders are located (e.g. live, work) near or on the contaminated land?

CHECKLIST : C3 (continued)

Contaminant characteristic	Code	Existing guidance and evidence to support the plan's development	Questions to consider as you develop your plan
Location of contamination	C3.16	**Contaminant is securely immobilised onsite:** The question of whether the substance(s) contaminating the site are securely immobilised within the site, such as under a building or carpark, and whether or not they are currently causing any offsite consequences to stakeholders or the environment, may affect the extent of engagement.	**Q** Is the substance(s) securely immobilised within the site? *Note: If the contamination at a site are immobalised, the sites may not require intervention under the CLM Act, but could be dealt with through the planning and development consent process.*
	C3.17	**Contaminant's ability to migrate:** The question of whether the substance(s) has migrated or is likely to migrate from the site (because of the nature of the substances or because of the nature of the land) may affect the extent of engagement.[269]	**Q** Have the substances migrated or are they likely to migrate from the site (because of the nature of the substances or because of the nature of the land)? ■ Who are the stakeholders in the area that is covered by the migration? *Note: If the answer to the first question is yes, regulatory provisions of the CLM Act may be enacted, affecting the scale of engagement required.*
Nuisance and amenity impacts of contamination	C3.18	**Land use restrictions:** The question of whether the uses to which the site and the land adjoining it are currently being put, or approved for, will affect the extent of engagement. The effect of land use will involve consideration of risk of harm from the contaminant substance(s); for example, use for child care, dwellings or domestic food production.[270]	**Q** Are the uses to which the site and land adjoining it currently being put, or approved for, likely to increase the risk of harm from the contaminant substance(s)? ■ Who are the stakeholders likely to be affected by this? *Note: If the answer to the first question is yes, regulatory provisions of the CLM Act may be enacted, affecting the scale of engagement required.*

CHECKLIST : C3 (continued)

Contaminant characteristic	Code	Existing guidance and evidence to support the plan's development	Questions to consider as you develop your plan
Nuisance and amenity impacts of contamination	**C3.19**	**Amenity impacts and nuisance:** The degree to which the contamination impacts amenities, and causes a nuisance, at the site or on the adjoining land will affect the extent of engagement.[271] Examples may include: ▸ decreased ability of land to support food production (e.g. restriction on eating vegetables from local gardens or farms) ▸ decreased ability of land to support recreational use (e.g. restricted access to local sports fields and parks) ▸ decreased air quality (e.g. odours) ▸ decreased quality of groundwater and surface water (e.g. restricted access to potable bore water, taste of potable water altered) ▸ decreased aesthetic value of landscape.	**Q** Have you considered what impacts the contamination may have on the amenities at the site or adjoining land? ■ Have you considered the nuisance that the contamination may cause for stakeholders? ■ Which stakeholders are affected by these amenity impacts and/or nuisance?
	C3.20	**Impacts on property values:** The degree to which the contamination has or is likely to have a negative impact (real or perceived) on property values of the site and adjoining land will affect the extent of engagement. [272]	**Q** Have you considered whether the contamination is likely to have a negative impact (real or perceived) on property values of the site or adjoining land? ■ Which stakeholders are likely to be affected by this?
	C3.21	**Exposure to amenity impacts and nuisance:** Stakeholders will want to know exposure information about these nuisances and amenity impacts – including risk level, duration, acceptable risk levels and how they are measured, how long it persists, and how it accumulates in the body.[273]	**Q** Do you have a clear understanding of the exposure information associated with the amenity impacts and nuisances that can be provided to stakeholders?
	C3.22	**Stakeholder perceptions of amenity impacts and nuisance:** How the stakeholders perceive the amenity impacts and nuisances will affect the extent of engagement.[274]	**Q** Does the plan provide for engagement activities that will enable residents and other stakeholders to discuss their experiences and perceptions of the amenity impacts and nuisances? ■ What are those experiences and perceptions?

CHECKLIST : C3 (continued)

Contaminant characteristic	Code	Existing guidance and evidence to support the plan's development	Questions to consider as you develop your plan
Human health impacts	C3.23	**Risks:** The question of whether the contamination is likely to pose a significant risk to human health will affect the extent of engagement..[275] The degree to which the substance(s) believed to cause the site to be contaminated have already caused harm to human health on the site or elsewhere will also affect the extent of engagement.[276] Furthermore, the extent of engagement will be affected by whether exposure pathways are available to the substance(s) – that is, the routes whereby the substances may proceed from the source of the contamination to human beings.[277]	**Q** Has the contaminant already caused harm to human health? ■ Are exposure pathways available to the substance(s), that is, are there routes whereby the substances may proceed from the source of the contamination to human beings? *Note: If the answer to the first question is yes, regulatory provisions of the CLM Act may be enacted, affecting the scale of engagement required.*
	C3.24	**Risk exposure:** Stakeholders will want to know exposure information about the human health risk – including risk intensity, duration, acceptable risk levels and how they are measured, how long the exposing agent is dangerous, how long it persists, and how it accumulates in the body.[278]	**Q** Do you have a clear understanding of the exposure information associated with any human health risk that can be provided to stakeholders?
	C3.25	**Access to health services:** If the contamination does pose a risk to human health, what can stakeholders do to find out if their health has already been affected?[279]	**Q** If the contamination does pose a risk to human health, what can stakeholders do to find out if their health has already been affected?
	C3.26	**Stakeholder risk perception:** The question of whether the contamination is likely to be perceived by stakeholders to pose a significant risk to human health will affect the extent of engagement.[280] For example, contaminant risks that are the cause of dreaded health effects such as cancer tend to arouse heightened levels of concern.[281]	**Q** Have you considered whether the contamination is likely to be perceived by the stakeholders to pose a significant risk to human health? ■ What are those perceived risks?

CHECKLIST : C3 (continued)

Contaminant characteristic	Code	Existing guidance and evidence to support the plan's development	Questions to consider as you develop your plan
Environmental Impacts	C3.27	**Risks:** The question of whether the contamination is likely to pose a significant risk to the environment will affect the extent of engagement.[282] The extent of engagement will be affected by whether the substance(s) believed to cause the site to be contaminated have already caused harm to some aspect of the environment (including any direct or indirect alteration of the environment that has the effect of degrading the environment), whether in, on or under the land or elsewhere.[283] Furthermore, the extent of engagement will be affected by whether exposure pathways are available to the substances – that is, whether there are routes whereby the substances may proceed from the source of the contamination to some aspect of the environment.[284]	**Q** Has the contaminant already caused harm to some aspect of the environment? Are exposure pathways available to the substance(s), that is, are there routes whereby the substances may proceed from the source of the contamination to some aspect of the environment? *Note: If the answer to the first question is yes, regulatory provisions of the CLM Act may be enacted, affecting the scale of engagement required.*
	C3.28	**Risk exposure:** Stakeholders will want to know exposure information –including risk intensity, duration, acceptable risk levels and how they are measured, how long the contaminant is dangerous, how long it persists, and how it accumulates in the flora, fauna, biota[285]	**Q** Do you have a clear understanding of the exposure information associated with any risk to the environment that can be provided to stakeholders?
	C3.29	**Stakeholder risk perception:** The question of whether the contamination is likely to be perceived by stakeholders to pose a significant risk to the environment will affect the extent of engagement.[286]	**Q** Have you considered whether the contamination is likely to be perceived by the stakeholders to pose a significant risk to the environment? ■ What are those perceived risks?
Effect of contamination on sense of place	C3.30	**Stigma:** Residents and other stakeholders may experience being stigmatised as a result of the contamination.[287] For example, an Australian study described that some residents perceive that it is their responsibility to control exposure to contamination, and they can experience shame if they believe they are perceived by others not to be limiting their exposure. Residents explained this sense of shame resulting from the perception that they could not afford to reside elsewhere. Conversely, some residents believed that gentrification and increasing house prices in areas with legacy contamination reduced this stigma.[288]	**Q** Have you considered if residents and other stakeholders are being stigmatised as a result of the contamination?

CHECKLIST : C3 (continued)

Contaminant characteristic	Code	Existing guidance and evidence to support the plan's development	Questions to consider as you develop your plan
Effect of contamination on sense of place	**C3.31**	**Sense of place:** The stronger a resident's sense of connection to their local community and environs the more likely they are to worry about the contamination in their neighbourhood.[289] In contrast, another study found no association between sense of place and level of worry about contamination.[290] Residents report that their attachment to place is eroded as a result of the contamination as their sense of place has changed.[291] Following contamination, residents can perceive their neighbourhood to be unnatural, damaged, unsafe, or insecure, whereas before the contamination they may have seen it as natural, clean, safe, and secure.[292]	**Q** Have you considered the impact the contamination has on a resident's sense of place?
	C3.32	**Impact on home:** What is the relationship between the contamination and the 'home' area of local residents and in particular Indigenous communities? An Australian study has shown that residents worried about the threat that contaminants posed to the security of their homes. Home in this context refers to the place, including both house and surrounding local environment, where residents lived. Residents' worries focused on how positive associations of 'home' with privacy, protection, security, amenity and self-identity were destabilised and inverted by the presence of the contamination. Participants reported that awareness of the presence of a contaminant replaced these positive associations with negative ones; 'home' became a conceivably hostile environment, filled with 'lurking' danger. Household services came to the fore of the residents' worries as sources of uncertain health risks, including, for example the water supply or the soil found in situ in yards. Concern about these uncertain health risks were amplified by the fact that contaminants were often perceived by participants as 'invisible', 'dangerous' and 'uncontrollable' home intruders. As one participant asserted, 'I'm worried ... [by] the fact that [the contaminant] can come up through the soil and leach into the water table and the air ... make its way into my home ... I feel exposed, unsafe, in danger'.[293] It is important to note that each Aboriginal community has an individual and special connection to their 'home' area. This should be taken into consideration when approaching a local Aboriginal community, as what may be acceptable to one group might not necessarily be acceptable to another. Each community needs to be addressed on an individual basis.[294]	**Q** Have you considered the threat that the contamination might pose to the sense of security that nearby residents get from their homes? Have you considered that each Aboriginal community has an individual and special connection to their 'home' area, and have you considered how the contaminant may impact this?

STEP 4

Identify the effect of the remediation and ongoing management of the site's contamination on residents and other stakeholders, and their acceptance of it

IN THIS SECTION

STEP 4

Identify the effect of the remediation and ongoing management of the site's contamination on residents and other stakeholders, and their acceptance of it

➨ Introduction

Step 4 of the guide is designed to help the user identify the effect of the remediation and ongoing management of the site's contamination on residents and other stakeholders, and their acceptance of it.

The development of an engagement plan requires an understanding of how residents and other stakeholders will be affected by, and engaged in, the remediation and ongoing management of the site's contamination. Stakeholder engagement plays a key role during the remediation and ongoing management of the contamination, not only as a means of appropriately engaging them in the development of the remediation and ongoing management approaches that may affect them, but also of engaging with them about self-care practices that may be needed to limit exposure to the contamination (e.g. restrictions on bore water use). The extent of engagement will depend on a variety of factors including: the extent of the remediation and ongoing management planned for the site, how the remediation and ongoing management impacts on residents and other stakeholders, and how residents perceive the risks and benefits of the remediation options to be used at the site, and their levels of support for those options.[295]

Remediation and ongoing management of contamination at a site in NSW generally takes place within a risk management context. Risk management describes a decision-making process used to analyse and compare the range of options for site management and the selection of appropriate responses to potential health or environmental hazards. As part of this process, consideration needs to be given to a range of influences – including political, social, economic, engineering and environmental factors, including issues of sustainability – to inform the decisions they make about remediation and ongoing management activities for a contaminated site.[296] The NSW EPA expects relevant stakeholders, including residents, to be engaged in the risk management decisions that are taken during the remediation and ongoing management of a contaminated site.[297]

Step 4 contains three checklists which help the user address three key questions. We first detail the three key questions that guide the three checklists in this step, and then present the checklists. The letter '**R**' in used to distinguish the checklists in Step 4, and is a reference to the step's focus on the **R**emediation and ongoing management. The checklists within this step present existing evidence[298] and guidance[299] and associated questions to help the user identify and consider the effect of the remediation and ongoing management on residents and other stakeholders.

➨ Key questions

Does the plan consider:

the different stages of the remediation and ongoing management of the contamination at the site, and does it consider the roles of residents and other stakeholders at different stages?

the impacts of the remediation and ongoing management options on residents and other stakeholders?

how residents and other stakeholders perceive the risks and benefits of remediation options, and their levels of acceptance of these options?

CHECKLIST R1

Does the plan consider the different stages of the remediation and ongoing management of the contamination at the site, and does it consider the roles of residents and other stakeholders at different stages?

Related to : CASESTUDY 4

The engagement plan should include a description of any existing understanding of the overall remediation and ongoing management of the contamination in order to provide context for the stakeholder engagement process[300], and it should identify how affected and interested stakeholders will be engaged with during different stages of the remediation and ongoing management of the contamination at the site.

In the NSW context remediation includes: (a) preparing a long-term management plan (if any) for the land; (b) removing, dispersing, destroying, reducing, mitigating or containing the contamination of the land; and (c) eliminating or reducing any hazard arising from the contamination of the land (including by preventing the entry of persons or animals on the land).[301] Remediation planning may include preparation of site management planning, waste management planning, and health and safety planning. At some sites, where full remediation of a contaminated site is not feasible or reasonable, the remediation process may be followed by ongoing monitoring and management.

Key stages in the remediation and ongoing management of the contamination at the site may include:

- remediation planning and implementation
- remediation validation
- ongoing monitoring and management
- an independent audit/review.

It is important to note that the scope of remediation and ongoing management of the contamination at a site may change over time. For example, a previously unknown contaminant might be found at the site, or a remediation plan might fail to meet its anticipated goals, so the engagement plan may need to be adapted.

CHECKLIST : R1

Remediation process	Code	Existing guidance and evidence to support the plan's development	Questions to consider as you develop your plan
Remediation planning and implementation	**R1.1**	**Remediation planning:** Remediation planning is used to specify the objectives of the site's remediation, how the work will be done, and the criteria against which successful completion of the remediation can be measured.[302] Remediation planning is based on information from the assessment of site contamination (i.e. the preliminary and detailed site investigations discussed previously), having regard to the proposed use of the site. In the NSW context a remediation plan is either prepared or approved by a certified contaminated land consultant for the site, and should be fit for purpose, with the level of detail in the plan responding to the scale, complexity and risks of the proposed remediation works.[303] The scale, complexity and risks of the proposed remediation works will inform the extent of stakeholder engagement required. A remediation plan may be accompanied by a stakeholder engagement plan (also known as a community relations plan) and/or an environmental management plan, where appropriate.[304]	**Q** Does the engagement plan include a description of any existing understanding of the overall remediation planning for the site in order to provide context for the stakeholder engagement process?[305] This description may address the following questions: ■ Will a remediation plan(s) be developed for the site? ■ What are the scale, complexity and associated risks of the proposed remediation works detailed within this plan(s)? (This question is discussed in greater detail in Checklist R2 below) ■ Will a stakeholder engagement plan be developed to accompany the remediation plan(s)? ■ Will an environmental management plan be developed to accompany the remediation plan(s)? ■ Who is the certified contaminated land consultant(s) responsible for the remediation plan(s)? ■ Who is responsible for implementation of the remediation plan(s) and ensuring compliance? ■ What are the reporting mechanisms detailed in the remediation plan(s)? ■ Does the engagement plan consider when and how to engage with stakeholders during the site's remediation planning process, and the preferred approach to remediation identified through the process?

CHECKLIST : R1 (continued)

Remediation process	Code	Existing guidance and evidence to support the plan's development	Questions to consider as you develop your plan
Remediation planning and implementation	**R1.2**	**Category 1 and/or Category 2 remediation works :** Remediation planning for the site might include Category 1 or Category 2 remediations works. When developing the engagement plan it is important to note that these categories of remediation works have different formal processes. Whilst the list of works in Category 1 need development consent based on their scale, risk and complexity, works in Category 2 do not need development consent because they are technically straightforward, moderate in scale and can be reasonably expected to have low impact on community and the environment.[306, 307] ▸ For Category 1 remediation works, a development application is prepared, including a remediation plan and environmental impact statement if required. A stakeholder engagement plan may be included with the development application, where appropriate.[308] The development application will be publicly advertised by the authority (for at least 30 days) and public submissions received. [309] ▸ For Category 2 remediation works, only a notification is required (at least 30 days before remediation works commence, or the day before, in the case of emergency work subject to a management order under the CLM Act) of pending works to the authorities, and no public advertisement is required.[310]	**Q** Does the engagement plan include a description of any existing understanding of whether the remediations works at the site are Category 1 and/or Category 2, including who the consent authority for the Category 1 and /or Category 2 remediation works are (e.g. Council or other consent authority)? **Q** Does the engagement plan consider when and how to engage with stakeholders about any Category 1 and/or 2 remediation works to be carried out at the site? ■ How will the plan address any public advertisement published by an authority for Category 1 remediation works, and the public submissions received? ■ What documents will be included in the public advertisement by the authority (e.g. remediation plan, environmental management plan (EMP), stakeholder engagement plan)?
	R1.3	**Site management plan:** The remediation planning process may include the preparation of a site management plan. A site management plan may include, for example, a site stormwater management plan, soil management plan, noise control plan, dust control plan, including wheel wash (where applicable), and an odour control plan. [311]	**Q** Does the engagement plan include a description of the site management plan? **Q** Does the engagement plan consider when and how to engage with stakeholders about the site's management plan?
	R1.4	**Waste management plan and report:** The remediation planning process may include the preparation of a waste management plan and report. A waste management plan and report details issues such as: waste classification and compliance with the waste regulation, where the waste will go, how it will be treated and transported.[312]	**Q** Does the engagement plan include a description of the sites waste management plan? **Q** Does the engagement plan consider when and how to engage with stakeholders about the waste management plan and report?

CHECKLIST : R1 (continued)

Remediation process	Code	Existing guidance and evidence to support the plan's development	Questions to consider as you develop your plan
Health and safety planning	**R1.5**	**Health and safety planning:** Contaminated sites can often reveal the presence of contaminants that can impact human health. Health and safety plans are developed to address the potential impacts on human health. In some instances, the NSW Ministry of Health may be asked to provide expert opinion and assistance. In these instances, a local Public Health Unit will assess the potential public health impacts associated with the contaminated land and provide advice on effective management of these risks. Communication of potential risks and mitigation measures to local residents is also managed by the Public Health Units. In certain circumstances management and exclusion zones may be created to address longer-term and short-term threats.	**Q** Does the engagement plan include a description of any existing understanding of ongoing health and safety planning that is being carried out for the site in order to provide context for the stakeholder engagement process? [313] **Q** Does the engagement plan consider when and how to engage with stakeholders about the waste management plan and report?
Validation of remediation	**R1.6**	**Validation:** Validation is the process of determining whether the objectives of the remediation have been achieved, and whether any conditions of development consent or approval in relation to remediation have been met.[314]	**Q** Does the engagement plan include a description of any existing understanding of the validation process of the remediation works for the site in order to provide context for the stakeholder engagement process?[315] ■ Who is the certified contaminated land consultant responsible for carrying out the validation process? **Q** Does the engagement plan consider how to engage with stakeholders about the validation process(es) for the site's remediation works?
	R1.7	**Notice of completion:** A notice of completion is issued to a consent authority when the remediation work has been completed.[316] A notice of completion is prepared or approved by a certified contaminated land consultant for all remediation works. The notice of completion must include a validation that states whether the clean-up objectives have been achieved and whether any further remediation work or restrictions on land use are required.[317] The engagement plan should include a description of any existing understanding of any notice of completion in order to provide context for the stakeholder engagement process.[318]	**Q** Who is the certified contaminated land consultant responsible for completing the notice of completion? **Q** Does the engagement plan consider when and how to engage with stakeholders about the site's notice of completion(s)?

CHECKLIST : R1 (continued)

Remediation process	Code	Existing guidance and evidence to support the plan's development	Questions to consider as you develop your plan
Ongoing monitoring and management	**R1.8**	**Environmental management plan (EMP):** Where full remediation of a contaminated site is not feasible or reasonable, an ongoing management plan may be needed to ensure that appropriate environmental management and monitoring practices are implemented at the site [319] through the preparation and implementation of an EMP. An EMP sets out how the residual contamination on a site will be managed and monitored following the approval of the remediation work, or approval of another land use. An EMP may be appropriate when: ▸ complete remediation of a certain area of land is not practicable ▸ it is proposed that contaminants be capped or contained on-site ▸ remediation is likely to cause a greater adverse impact than would occur if the site was left undisturbed. An EMP is a stand-alone, fit-for-purpose document that can be easily understood by future landowners, users, regulators and the community. Generally, an EMP should be prepared or approved by a certified contaminated land consultant or accredited site auditor.[320]	**Q** The engagement plan should include a description of any existing understanding of the environmental management plan(s) in order to provide context for the stakeholder engagement process. [321] This description may address the following questions: ■ What is the nature and extent of the residual contamination? ■ What are the proposed management and monitoring strategies detailed in the EMP, and how do they affect the community? ■ When implemented, how will the actions proposed in the EMP provide protection to human health and the environment? ■ Who will be responsible for the implementation of the EMP and ensuring compliance? ■ What are the reporting mechanisms detailed in the EMP? ■ How will the EMP be recorded in the consent authority's records? **Q** Does the engagement plan consider when and how to engage with stakeholders about the EMP?

CHECKLIST : R1 (continued)

Remediation process	Code	Existing guidance and evidence to support the plan's development	Questions to consider as you develop your plan
Independent review	**R1.9**	**Site audit report and statement:** In some circumstances, a consent authority may decide to engage a certified contaminated land consultant, or an accredited site auditor[322], to independently review the work of a contaminated land consultant through a site audit.[323] An independent review may be necessary when: the consent authority believes on reasonable grounds that the information provided by an applicant is incorrect or incomplete; the contamination and/or remediation issues are complex and the planning authority does not have the internal resources to conduct its own technical review; or the consent authority requires additional certainty that a site can be made suitable for a particular use or uses if remediated in accordance with a remediation plan.[324] In some circumstances, a site audit may be required by law. These site audits are known as statutory site audits and may be needed to secure compliance with a requirement of the CLM Act. A site audit statement outlines the findings of a site audit. The site audit statement will be accompanied by a site audit report which contains the information, discussion and rationale that support its conclusions. [325]	**Q** Does the engagement plan include a description of any existing understanding of site audit reports and statements that have been carried out for the site in order to provide context for the stakeholder engagement process? [326] This description may address the following questions: ■ What is the purpose of the site audit (e.g. is it a statutory site audit)? ■ What are the site audit's conclusions, and what does the associated statement conclude? ■ Who is the certified contaminated land consultant or auditor who undertook/is carrying out the site audit? **Q** Does the engagement plan consider when and how to engage with stakeholders about site audits and statements?
Remediation legacy	**R1.10**	**Maintain records on the management and remediation of the site:** A key expectation of NSW contaminated land policy and legislation is that authorities will maintain records on a site's remediation works to provide the community with information and support future decisions.[327] A consent authority should ensure that information about remediation works is provided to stakeholders and the community, especially potential purchasers and occupiers of land, in a fair and equitable manner.[328] A key mechanism for ensuring that this information is provided is a planning certificate under section 149 of the EP&A Act.[329]	**Q** Does the engagement plan consider when and how to engage with stakeholders about how information associated with the management and remediation of the site contamination will be recorded and maintained by authorities?

CASESTUDY 4

Learning lessons for enhancing resident support for remediation options at George Street, Leichhardt: Engaging with residents' perceived safety concerns over the application of remediation options

CONTEXT

Timeframe	2013–Present
Site	George Street, Leichhardt
Contaminant(s)	Mix of asbestos, solvent and lead
Selected remediation option	Excavation, demolition and removal off-site
Issue	Perceived safety of remediation options and support for remediation activity
Related checklist	**Checklist R1** Does the plan consider the different stages of the remediation and ongoing management of the contamination at the site, and does it consider the roles of residents and other stakeholders at different stages?

LESSONS LEARNED

- Resident support for particular remediation options is based upon a range of predictors and norms.
- Providing residents with information about the safety of remediation options helps to enhance resident support for the application of those options.
- To improve resident support for remediation processes the local council and Environment Protection Authority should ensure that independent scientific investigations are conducted to address residents' concerns about the safety of the application of remediation options.

Situation

In 2013, a mix of asbestos and chlorocarbons, including vinyl chloride which is a type of highly toxic chlorinated solvent, were detected in the soil and groundwater at numbers 22 and 30–40 George Street, Leichhardt, Sydney. These contaminants were traced back to the former Kolotex clothes factory and Labelcraft printing factory, which operated on the adjoining sites from the 1940s[330, 331] (Barr 2015; Barwell 2017). Lead was also found in the soil of nearby properties, with gardens in Leichhardt containing 960 milligrams of lead for every kilogram of soil.[332] The lead contamination resulted from a combination of industrial legacy contamination and previous use of leaded petrol in vehicles and leaded paint in homes.[333]

Plans were made for the former Kolotex site to be redeveloped into higher density housing in 2013, however construction was delayed due to the need to remediate the site.[334] A Phase One environmental site assessment was undertaken in 2013, which found there was a potential for soil and groundwater contamination.[335] In late 2014, the local council rejected Greenland George Street Development Pty Ltd's (Greenland's) initial apartment development proposal for the project based on the high levels of contaminants present on the land.[336] The Environment Protection Authority (EPA) was concerned about contaminated groundwater spreading to nearby homes.[337] The local council said that people living near the George Street area should assume that all the soil was contaminated until proven otherwise, because gardens were located on the sites, or in close proximity to the sites, of old industrial factories.[338] Almost half of the houses in the Leichhardt area grow some form of edible produce in their gardens.[339]

Actions Taken

In 2014, Greenland proposed a voluntary clean-up plan to the authorities to ensure the safety of future residential development. This involved the removal of the hazardous substances through demolition of existing buildings and excavation and removal of contaminated soils and materials, as well as diversion of existing stormwater and sewer services. The EPA approved the plan on the basis that Greenland would carry out the remediation of its own accord. However, by 2015, Greenland had not carried out the remediation according to the terms of the proposal.[340] Construction was officially delayed because of this failure to remediate the site voluntarily.[341] The EPA then ordered Greenland to complete the remediation according to requirements for residential developments in 2016 through a management order.[342] The local council approved work to remove rubble and material from the site, including materials contaminated with asbestos.[343]

According to the Leichhardt Council Development Control Plan no. 42 for Contaminated Land Management, its key principles for dealing with contaminant issues are: 1) to ensure that changes in land use will not increase the risk of exposure for human and environmental health, 2) to avoid inappropriate restrictions on land use, and 3) to provide information to support decision-making and to inform the community. However, recent studies found that while scientists and regulators were aware of the contamination in the soils in the area, the majority of the public thought that they had not been adequately informed about the situation.[344] Members of the public also raised concerns about the remediation actions taking place at the former Kolotex site, particularly noise and traffic disruption.[345] The NSW Government Joint Regional Planning Panel met in 2015 to discuss this, but the community said that they had been excluded from the meeting.[346] Residents then complained as they felt they should have had the chance to address the panel.[347] Residents were particularly concerned about demolition of the former factory buildings because of the risk of contamination via dust spread throughout the neighbourhood.[348] This concern resulted in low levels of support for the remediation.

However, beginning in 2013, VegSafe, a community science program, was implemented by environmental scientists at Macquarie University to inform the public about risks of exposure in the home environment. As part of this scheme, residents near the contaminated site in Leichardt were provided with free soil testing, screening for heavy metal-based contaminants for their gardens, a formal report on their soil results, and advice about what to do next.[349] By June 2018, over 5500 tests had been distributed.[350] The scheme encouraged community members to build raised beds containing uncontaminated soil, to cover lawns year-round to minimise dust generation, to replace all contaminated soil, and to add compost to new soils regularly. Residents were also advised to use gloves when gardening and to wash their hands

immediately after handling soil.[351] Advice given was that the vegetables grown were safe to eat because plants do not tend to absorb or accumulate lead.[352] Scientists from Macquarie University also recommended that people living in homes built before 1970 should have their paintwork tested for lead contamination and use qualified lead-abatement decorators to help prevent exposure.[353]

Outcomes

The community science program helped residents to understand the level of risk about the contamination and to obtain a greater sense of control over exposure. Residents also felt that receiving information and assistance from an academic organisation, rather than from a government or industry organisation, helped to alleviate their concerns about the accuracy of information. This was because residents believed academic organisations to be less biased in the reporting of study findings than government or industry.

Conclusions and recommendations

Previous research has demonstrated that resident support for particular remediation options is based upon a range of predictors and norms. One of these key predictors is the perceived characteristics of the proposed remediation options. One example of this is the perceived safety of particular remediation options.[354, 355, 356] Existing research has demonstrated that resident support for particular remediation options is often conditional upon availability of empirical evidence proving them to be safe.[357] Norms that affect support include engagement with independent experts or regulatory bodies to show that a remediation option has the desired safety characteristics. Resident refusal to support particular remediation options on the basis of safety can be expressed through inhibiting the movement of those carrying them out, lodging complaints through formal regulatory processes, instigating economic sanctions or restrictions on specific organisations carrying out the remediation process, protesting against the application of remediation options, generating political sanctions, and spotlighting the actions of those carrying out the remediation with the support of the media.[358]

Important lessons can be learnt from the acceptance of the VegSafe scheme, as an example of a particular remediation process intervention, for improving resident engagement with the application of remediation options. In particular, engaging the services of institutions that residents perceive to be more independent than government or corporate agendas may help to enhance resident support for remediation options by addressing any safety concerns they might have regarding the safety of the application of remediation options.

CHECKLIST R2 **Does the plan consider the impact of the remediation and ongoing management options on residents and other stakeholders?**

Some key goals of remediation are to ensure the remediated site will be suitable for its proposed use and will pose no unacceptable risk to human health or to the environment.[359] As a general rule, remediation and ongoing management of contaminated land is encouraged within the NSW context as it can improve the quality of the environment, reduce risks to human health, restore land to productive use, and reduce adverse impacts. However, remediation also has the potential for environmental and human health impacts, and it has the potential to adversely affect local amenity or give rise to nuisance conditions such as noise, truck movements or odour. These adverse impacts of remediation must be adequately identified, mitigated and managed.[360] As a general guide, if the remediation and management of a contaminated site has a significant impact on a community, more extensive engagement is expected.[361] Stakeholder engagement plays a key role during the remediation and ongoing management of the contamination at the site, not only as a means of making residents aware of impacts, but also of engaging them in self-care practices that may be needed to mitigate exposure to the contamination (e.g. bore water use restrictions).

CHECKLIST : R2

Remediation characteristics	Code	Existing guidance and evidence to support the plan's development	Questions to consider as you develop your plan
Location	**R2.1**	**Treatment and storage location of contamination:** In identifying affected and interested residents and other stakeholders, consideration needs to be given to the location (onsite in-ground, onsite out-of-ground, offsite) of the remediation works, and in particular the location where the contaminant is either treated or contained. Some sites might have one or more remediation option over time, which means that a site may have multiple treatment and/or storage locations for the site's contaminants.[362]	**Q** Does the engagement plan consider the locations where the site's contaminants are either treated or stored, and identify the residents and other stakeholders who are located near this area?
	R2.2	**Management zone(s):** In identifying affected and interested residents and other stakeholders, consideration needs to be given to the location of management zones that are put in place to address risks associated with the contaminant, and are located near or within these areas.[363] Sites may have management zones that overlap. For example, one remediation site in NSW had three management zones (1, 2 and 3) emanating out from the source site. Residents within Management Areas 1 and 2 required engagement about avoiding drinking, cooking or unintentionally ingesting groundwater and avoiding eating home grown leafy green vegetables, eggs from backyard poultry, red meat from home grown cattle or sheep, or fish. Residents in Management Area 1 required additional engagement about avoiding drinking home grown milk. Residents in Management Area 3 required engagement to advise them to avoid drinking groundwater or using it in cooking, and to avoid eating fish.	**Q** Does the engagement plan consider whether the site has any management zones, and does it identify the residents and other stakeholders who are located near or within this area?
	R2.3	**Exclusion zone(s):** In identifying affected and interested residents and other stakeholders, consideration needs to be given to the location of any exclusion zones associated with the contamination at the site and who is within this area.[364] Furthermore, consideration needs to be given to the way in which these exclusion areas may be cordoned off from public access (e.g. fencing and warning signs).[365] An Australian study has shown that exclusion zones that established observable boundaries amplified residents' worries about threats to health and wellbeing.[366]	**Q** Does the engagement plan consider whether the site has any exclusion zones, and does it identify the residents and other stakeholders who are located near or affected by these zones?

CHECKLIST : R2 (continued)

Remediation characteristics	Code	Existing guidance and evidence to support the plan's development	Questions to consider as you develop your plan
Location	**R2.4**	**Cultural sites:** The degree to which the risk management and remediation approach impacts on cultural sites, including Indigenous sites, will influence the extent of engagement. It is important to consult with all relevant Indigenous community representatives if practical, since this reduces the possibility of information on the existence of Aboriginal sites being missed during the process. It is preferable to relocate any proposed works to avoid disturbance to a site. However, if that is not possible, formal approval to alter a site may need to be sought from the relevant authority.[367]	**Q** Does the engagement plan consider whether the remediation options, management zones, or exclusion zones will impact on cultural sites, including Indigenous sites? ■ Have you consulted with the relevant Indigenous community members that speak for different country and sites, and other authorities?
Duration	**R2.5**	**Duration:** In identifying affected, and interested residents and other stakeholders, consideration needs to be given to the duration of remediation options, management zones and exclusion zones at the site.[368] Some remediation options and zones may extend across generations (one generation is generally considered to be 30 years). The intergenerational effects of these options and zones within a given community can be a difficult issue to grapple with when developing an engagement plan.[369] Over time, the remediation options and zones are likely to include a variety of actions or stages that might impact on different stakeholders at different points in time (e.g. a zone might change as new understandings of the contaminants' movements are refined and developed, or a zone might be established as an immediate action is required when short-term threats arise, that is, acute risks, such as the accumulation of explosive vapours in underground utilities). Where possible, clear timeframes for actions to be taken during the management and remediation process should be provided to residents and other stakeholders (e.g. remediation schedule and hours of operation).[370]	**Q** Does the engagement plan consider the duration of remediation options, management zones, and exclusion zones at the site? ■ Who are the residents that are likely to be affected by, and interested in, these options and zones over time? ■ Have you considered the intergenerational effects of the site's remediation options and zones?
Stakeholders hierarchy of perceived impacts	**R2.6**	**Human health and environment services:** Generally, residents and other stakeholders are most concerned about how a remediation option addresses the human health risks and benefits associated with the contamination at a site. This is followed by risks and benefits generated by the remediation options for the services the environment provides to humans (e.g. fresh and drinkable bore water). Stakeholders are least concerned about the ability of the remediation options to benefit the environment (e.g. flora and fauna).[371]	**Q** When engaging with residents and other stakeholders, does the plan consider how they might prioritise concerns about how the remediation options will address particular risks associated with the contamination?

CHECKLIST : R2 (continued)

Remediation characteristics	Code	Existing guidance and evidence to support the plan's development	Questions to consider as you develop your plan
Human health impacts	**R2.7**	**Risks:** Stakeholders will want to know how the remediation options and ongoing management at the site reduce or eliminate any human health risks associated with the contamination at the site.	**Q** Does the engagement plan consider how the remediation options and ongoing management at the site reduce or eliminate any human health risks associated with the contamination at the site?
	R2.8	**Who will do what:** Residents and other stakeholders will want to know what they should do, and what organisations and agencies are doing, as part of the remediation and ongoing management options for the site to reduce human health risks to themselves, their families and their children.[372] Such action may be documented in the site's remediation plan(s), and associated documents such as the site's health and safety plan[373] and occupational health and safety plan.[374] Management zones and exclusion zones identify areas in which residents and other stakeholders are required to undertake certain actions to reduce human health risks.[375]	**Q** Does the engagement plan consider what residents, organisations and agencies are doing as part of the remediation and ongoing management options for the site to reduce human health risks?
	R2.9	**Benefits:** Whilst one key benefit of remediation is to reduce or eliminate any human health risks associated with the contamination at the site, remediation options might also generate additional benefits to human health and wellbeing (e.g. the remediation may allow land uses, such as sports field and recreation areas, that promote ongoing health and wellbeing within communities). These health co-benefits of remediation are often ignored.	**Q** Beyond reducing or eliminating any human health risks associated with the contamination at the site, does the plan consider health co-benefits that may result from the site's remediation? ■ Have these health co-benefits been communicated to the stakeholders?
	R2.10	**Contingency plans:** Contingency plans are often put in place as part of a site's remediation planning to respond to site incidents, and to remove potential effects to the health of the surrounding community that may arise during the remediation and ongoing management of the contamination.[376]	**Q** Does the engagement plan have a clear understanding of any contingency plan that has been put in place to respond to human health risks that may arise during the remediation and ongoing management of the contamination at the site?

CHECKLIST : R2 (continued)

Remediation characteristics	Code	Existing guidance and evidence to support the plan's development	Questions to consider as you develop your plan
Human health impacts	**R2.11**	**Stakeholders risk and benefit perceptions:** When engaging with residents and other stakeholders about remediation options, it is important to understand that they will have their own perceptions of the remediation options' benefits and risks to human health. Residents' perceptions of the health risks and benefits of remediation options have been found to be diverse, ranging from benefits and risks to physical health and mental health (e.g. worry, anxiety) through to benefits and risks to their boarder wellbeing (i.e. quality of everyday life). See Table 4 for types of risks and benefits to human health and wellbeing that residents associate with remediation options.[377] Residents have been found to perceive higher levels of risk to human health from chemical remediation (especially nanoremediation) and thermal remediation options, than they do from bioremediation options, particularly phytoremediation.[378]	**Q** Is the engagement plan sensitive to the perceived risks and benefits to human health and wellbeing that residents associate with remediation options? ■ What are those perceived risks and benefits?
Environmental impacts	**R2.12**	**Risks:** Stakeholders will want to know how the remediation options and ongoing management at the site reduce or eliminate any risks to the environment associated with the contamination at the site.	**Q** Does the engagement plan consider how the remediation options and ongoing management at the site reduce or eliminate any environmental risk associated with the contamination at the site?
	R2.13	**Who will do what:** Residents and other stakeholders will want to know how remediation options and ongoing management options are being selected to safeguard the environment, and where it is not possible to select remediation options that safeguard the environment (e.g. due to the prioritisation of human health over environment)[379] stakeholders will want to know that the remediation option is being carried out in a manner that is as environmentally acceptable as possible.[380] Residents and broader stakeholders have been found to be aware of and concerned about the way in which remediation options might impair local ecosystems – for example, decreasing plant diversity and de-vegetation (e.g. destruction of above-ground vegetation and below-ground seeds and root material), and/or impairment or destruction of soil habitats, micro-organisms and outmigration by vertebrates (e.g. failure of soil habitats to recover if non-indigenous fill soil is used). See Table 4 for types of risks and benefits to the environment that residents associate with remediation options.[381]	**Q** Does the engagement plan consider how remediation options safeguard the environment, and if the preferred remediation option is being carried out in a manner that is as environmentally acceptable as possible? ■ Have these approaches been communicated to the stakeholders?

CHECKLIST : R2 (continued)

Remediation characteristics	Code	Existing guidance and evidence to support the plan's development	Questions to consider as you develop your plan
Environmental impacts	**R2.14**	**Benefits:** Whilst one key benefit of remediation is to reduce or eliminate any environmental risks associated with the contamination at the site, remediation options might also generate additional benefits to the environment; for example, the selected remediation option may lead to the regeneration of aboveground vegetation.	**Q** Beyond reducing or eliminating any environmental risks associated with the contamination at the site, does the plan consider how the remediation option used at the site benefits the environment? ■ Have these environmental benefits been communicated to the stakeholders?
	R2.15	**Contingency plans:** Contingency plans are often put in place as part of a site's remediation planning to respond to site incidents, to obviate potential effects on the environment that may arise during the remediation.[382]	**Q** Does the engagement plan have a clear understanding of any contingency plan that has been put in place to respond to environmental risks that may arise during the remediation and ongoing management of the contamination at the site?
	R2.16	**Stakeholder risk and benefit perceptions:** When engaging with residents and other stakeholders about remediation options, it is important to understand that they will hold their own perceptions of how remediation options will result in benefits and risks to the environment. Residents' perceptions of the environmental risks and benefits of remediation options have been found to be diverse – including improvements to, or the destruction of, wildlife habitats.[383] See Table 4 for types of risks and benefits to the environment that residents associate with remediation options.[384]	**Q** Is the engagement plan sensitive to the perceived risks and benefits to the environment that residents associate with remediation options? ■ What are those perceived risks and benefits?
Nuisance and amenity impacts	**R2.17**	**Reduce or eliminate land use restrictions:** Stakeholders will want to know how the remediation options and ongoing management will reduce or eliminate any restrictions that the contamination places on the uses to which the site and land adjoining it are currently being put, or are approved for (e.g. removal of restriction of access to bore water or removal of exclusion zones).[385]	**Q** Does the engagement plan identify how remediation options and ongoing management reduce or eliminate any restrictions that the contamination places on the uses to which the site and land adjoining it are currently being put, or are approved for?

CHECKLIST : R2 (continued)

Remediation characteristics	Code	Existing guidance and evidence to support the plan's development	Questions to consider as you develop your plan
Nuisance and amenity impacts	**R2.18**	**Reduce or eliminate other amenities and nuisances:** Beyond restrictions on land-use, stakeholders will want to know how the remediation options and ongoing management will reduce or eliminate other amenities and nuisances caused at the site or adjoining land by the contamination[386], such as reducing odours caused by the contamination.	**Q** Beyond land-use restrictions, does the plan identify how remediation options and ongoing management reduce or eliminate other amenities, and nuisances, caused at the site or adjoining land by the contamination?
	R2.19	**Reduce or eliminate negative impacts on property values:** Stakeholders will want to know how and when the remediation options and ongoing management may reduce or eliminate any negative impacts (real or perceived) on property values of the site and adjoining land resulting from the contamination.[387]	**Q** Does the engagement plan consider that residents will want to know how and when the remediation options and ongoing management may reduce or eliminate any negative impacts (real or perceived) on property values of the site and adjoining land resulting from the contamination?
	R2.20	**Remediation adverse impacts:** Stakeholders will want to know how the remediation options and ongoing management might generate their own adverse impacts on the amenities of, and cause nuisances to, residents and other stakeholders (e.g. restrictions on land-use, adverse impacts on air quality and odours from the remediation processes, noise from the remediation plant, visual impacts from temporary stockpiles of contaminated material, dust).	**Q** Does the engagement plan consider the types of amenity impacts and nuisances the remediation options and ongoing management at the site may generate for nearby residents and other stakeholders?
	R2.21	**Who will do what:** Residents and other stakeholders will want to know what organisations and agencies are doing to reduce potential amenity impacts and nuisances caused by remediation options and ongoing management (e.g. ensure no burning of material onsite, maintain equipment in functional manner to minimise exhaust emissions, establish dust suppression and control measures to minimise wind-borne emissions of dust, having regard to site-specific wind conditions). Such actions may be documented in the site's remediation plan(s), and associated documents such as the site's management plan, and they might include: a site stormwater management plan, soil management planning, a noise control plan, a dust control plan (including wheel wash, where applicable), and an odour control plan.[388] Stakeholders may also wish to know what types of air, water and noise monitoring have been put in place to measure the success of these plans (e.g. regularly monitoring and managing odours and noise quality throughout work and sending results to the appropriate regulatory authority).[389]	**Q** Does the engagement plan consider what organisations and agencies are doing to reduce potential amenity impacts and nuisances caused by remediation and ongoing management of the contamination?

CHECKLIST : R2 (continued)

Remediation characteristics	Code	Existing guidance and evidence to support the plan's development	Questions to consider as you develop your plan
Nuisance and amenity impacts	**R2.22**	**Benefits:** Whilst one key benefit of remediation is to reduce or eliminate any amenity impacts and nuisances associated with the contamination at the site, remediation options might also generate additional benefits to amenity (e.g. rezoning of land to allow for a greater diversity of uses and sensitive land uses that are needed within a region, or generating local employment opportunities). These additional benefits of remediation are often ignored.	**Q** Beyond reducing or eliminating any amenity impact or nuisances associated with the contamination at the site, does the plan consider other benefits that may result from the site's remediation? ■ Have these benefits been communicated to the stakeholders?
	R2.23	**Contingency plans:** Contingency plans are often put in place as part of a site's remediation planning to respond to site incidents, to reduce potential amenity impacts and nuisances to surrounding community that may arise during the remediation and ongoing management of the contamination.[390]	**Q** Does the engagement plan have a clear understanding of any contingency plan that has been put in place to respond to potential amenity impacts and nuisances to surrounding community that may arise during the remediation and ongoing management of the contamination?
	R2.24	**Stakeholder risks and benefit perceptions:** When engaging with residents and other stakeholders about remediation options, it is important to understand that they will hold their own perceptions of the remediation options' risks and benefits to local amenity. Residents' perceptions of the risks and benefits of remediation options to local amenity are diverse, ranging from the remediation option's ability to increase or decrease the ability of land to support land use types (e.g. residential use, commercial use, recreational use, industrial use) through to removing or increasing odours that are a nuisance to local residents. See Table 4 for types of risks and benefits to human health and wellbeing that residents associate with remediation options.[391]	**Q** Is the engagement plan sensitive to the perceived risks and benefits to local amenity that residents associate with remediation options? ■ What are those perceived risks and benefits?

Table 4. Risk and benefit types that residents associate with remediation options

Benefit types	Risk types
Benefit 1. Improved stakeholder's health and wellbeing:	**Risk 1. Impaired stakeholders' health and wellbeing:**
Benefit 1.1. Improved physical health	Risk 1.1. Impaired physical health
Benefit 1.2. Other types of improved health, e.g. reduced anxiety	Risk 1.2. Other types of impaired health, e.g. increased anxiety
Benefit 1.3. Improved economic viability, e.g. by contracting local vendors.	Risk 1.3. Impaired economic viability, e.g. business disruptions
Benefit 1.4. Increased sense of security, e.g. of services, health, property and access.	Risk 1.4. Reduced sense of security, e.g. of services, health, property and access
Benefit 1.5. Improved social relations, e.g. community and social relations	Risk 1.5. Impaired social relations, e.g. stigmatisation and conflict
Benefit 1.6. Increased freedom of choice, e.g. increased social and economic freedom	Risk 1.6. Decreased freedom of choice, e.g. decreased social and economic freedom
Benefit 1.7. Enhanced quality of everyday life, e.g. through increased recreational opportunities	Risk 1.7. Reduced quality of everyday life, e.g. decreased recreational opportunities
Benefit 1.8. Reduced undesirable environmental impacts, e.g. removing odours	Risk 1.8. Increased undesirable environmental
Benefit 1.9 Improved wellbeing and health of vulnerable populations.	Risk 1.9 Impaired wellbeing and health of vulnerable populations.
	Risk 2. Impaired workers' health:
	Risk 2.1. Impaired physical health
Benefit 3. Increased provision of local ecosystem services:	**Risk 3. Decreased provision of local ecosystem services:**
Benefit 3.1. Improved value of real estate	Risk 3.1. Decreased value of real estate
Benefit 3.2. Increased ability of land to support food production	Risk 3.2. Decreased ability of land to support food production
Benefit 3.3. Increased ability of land to support recreational use	Risk 3.3. Decreased ability of land to support recreational use
Benefit 3.4. Increased ability of land to support human uses, e.g. residential use, commercial use, industrial use	Risk 3.4. Decreased ability of land to support human uses, e.g. residential use, commercial use, industrial use
Benefit 3.5. Improved air quality	Risk 3.5. Decreased air quality
Benefit 3.6. Improved quality of groundwater and surface water	Risk 3.6. Decreased quality of marine habitats, groundwater and surface water
Benefit 3.7. Improved aesthetic value of local landscape	
Benefit 3.8. Sustainable use of natural resources through remediation technology selection, e.g. reduced carbon emissions, reduced use of non-renewable resources.	

Table 4. Risk and benefit types that residents associate with remediation options

Benefit types	Risk types
Benefit 4. Improved local ecosystem:	**Risk 4. Impaired local ecosystem:**
Benefit 4.1. Maintain, recover or enhance plant diversity	Risk 4.1. Decreased plant diversity and de-vegetation, e.g. destruction of aboveground vegetation and below-ground seeds and root material
Benefit 4.2. Maintain, recover or enhance soil habitats, micro-organisms and invertebrates	Risk 4.2. Impairment or destruction of soil habitats, micro-organisms and outmigration by vertebrates, e.g. failure of soil habitats to recover if non-indigenous fill soil is used
Benefit 4.3. Maintain, recover or enhance marine, groundwater, surface water habitats	Risk 4.3. Impairment or destruction of marine, groundwater, surface water habitats
Benefit 4.4. Maintain, recover or enhance air quality	Risk 4.4. Decreased air quality and associated health effects to wildlife or plants
Benefit 4.5. Improved health of wildlife, e.g. fungi, bacteria	Risk 4.5. Impaired health of wildlife
Benefit 4.6. Maintain, recover or enhance and supporting habitats	Risk 4.6. Impairment or destruction of wildlife habitats

CHECKLIST R3

Does the plan consider how residents and other stakeholders perceive the risks and benefits of remediation and ongoing management options, and their levels of acceptance of these options?

Related to : CASESTUDY 5

There is a growing diversity of remediation and management options that can be used to address land contamination. The acceptable approach for a given site will depend on a range of considerations, including how affected residents and other stakeholders perceive and accept the application of these options at a nearby site. When engaging with residents and other stakeholders about remediation options it is important to understand how their perceived risks and benefits from those remediation options, and their support for any option, will be influenced by a broad range factors ranging from the remediation option's reputational effects through to its perceived effectiveness and plausibility.[392] The extent of engagement will also be affected by whether the remediation and ongoing management options are perceived as controversial. As a general guide, if the remediation and ongoing management at the site is perceived to have more risks and less benefits by affected residents and other stakeholders, more extensive engagement will be required.[393]

When seeking to understand how residents perceive the risks and benefits of remediation options, it is important to bear in mind that their perceptions of the risks of a remediation option affect their perceptions of that remediation option's perceived benefits, and vice versa, and that it is not possible to focus on one of these factors independently of the other.[394] Furthermore, it is important to understand that the meaning of stakeholders' acceptance of remediation options varies for different stakeholders involved with or affected by a contaminated site. A resident's acceptance can be better understood as the resident's level of support for the application of a remediation option in their local area. It has been found that a resident's level of support for a remediation option is pliable. This pliability is driven by a series of norms which guide a resident's willingness to negotiate their level of support during engagement with government and remediation experts at a site. These norms are concomitant with a series of sanctions (rules) that residents may enact if norms are not respected. These sanctions (rules) may have socio-political risks for those seeking to apply remediation options at a site without the support of residents.

CHECKLIST : R3

Stakeholder consideration	Code	Existing guidance and evidence to support the plan's development	Questions to consider as you develop your plan
Remediation and ongoing management options	**R3.1**	**Number of options and rationale for selection:** Whilst in some instances there may only be one viable remediation and management approach for a contaminated site, in other instances contamination at a site can be addressed through a number of different remediation and ongoing management options. The extent of engagement will be affected by: 1) the number of remediation and ongoing management options that may be appropriate for the site, and 2) the number of remediation and ongoing management options that may be utilised concurrently at a site.[395] When engaging with stakeholders about the remediation and ongoing management options for the site, consideration should be given to: ▸ stakeholder awareness of the rationale for the selection of recommended remediation and ongoing management options[396] ▸ stakeholder awareness of contingency plans if the preferred remediation and ongoing management approach fails.[397]	**Q** Does the engagement plan consider how to engage with residents and other stakeholders about the different remediation and ongoing management options that may be used to address the contamination at the site?
	R3.2	**Stakeholders role in selection of options:** It may be helpful to keep in mind that in general, stakeholders may want to have a clear understanding of how and when they might be engaged in the selection of remediation and ongoing management options for the site.[398] Involvement of residents and other stakeholders in actions that can mitigate the risk of the contamination can benefit the residents and other stakeholders. This is because their involvement tends to result in their having less concern about the risk because they tend to feel that they are able to exert some control over that risk.[399]	**Q** Does the engagement plan consider when and how stakeholders may be involved in the selection of remediation and ongoing management options for the site?

CHECKLIST : R3 (continued)

Stakeholder consideration	Code	Existing guidance and evidence to support the plan's development	Questions to consider as you develop your plan
Acceptance	**R3.3**	**Support as a type of acceptance:** The meaning of 'acceptance of remediation options' varies for different stakeholders involved with or affected by a contaminated site. For the government regulators it may mean approval as set out in remediation legislation; for a certified contaminated land consultant it may be that the remediation option addresses a set of technical criteria before being applied at a given site; and for a resident it may mean that they support the application of a remediation option in their local area because it has been successfully proven in other contexts. Research has highlighted that residents' acceptance of remediation options is not equated with the formal approval, direct use or application of remediation options – these are the responsibility of remediation regulators and certified contaminated land consultants, amongst others. Residents' levels of acceptance can be better understood as their levels of support for the application of a remediation option in their local area. Support in this context is understood as occurring along a spectrum that is an expression of the resident's perception of a remediation option's efficacy or lack of efficacy. For example, this spectrum can range from complete support, through to finding a remediation option tolerable through to withholding support for the option, and/or resisting the option or protesting against the option's application.[400]	**Q** Is the engagement plan sensitive to the ways in which different stakeholders accept remediation options, in particular the spectrum of support that residents might hold towards a remediation option?
	R3.4	**Assessing environmental improvements and human health improvements:** A stakeholder's level of support of remediation options can be influenced by the extent to which they expect it to improve environmental quality (e.g. improvement in air quality, ground water quality, or the ability to grow vegetables in a garden) and the importance of that environmental improvement to human health levels. For example, a resident's support of a remediation option increases significantly when it involves an improvement in air quality levels. In assessing the level of environmental or health improvement preferred by residents, detailed consideration needs to be given to the design of environmental quality ladders and health scales that can be used in the engagement process.[401]	**Q** Is the engagement plan sensitive to the ways in which residents' support of a remediation option is affected by the option's ability to improve local environmental quality levels (e.g. improvement in air quality, ground water quality, or ability to grow vegetables in a garden) and the utility of that environmental improvement to human health levels?

CHECKLIST : R3 (continued)

Stakeholder consideration	Code	Existing guidance and evidence to support the plan's development	Questions to consider as you develop your plan
Risk and Benefit perceptions	**R3.5**	**Risk and benefit perceptions:** There is increasing recognition that it is important to consider the risk and benefit perceptions of broader stakeholders for remediation options when undertaking the remediation and ongoing management planning for a site.[402] Whilst traditionally the focus at contaminated sites has often been placed on how residents and other stakeholders perceive the risk from the contamination at that site, it has been found that residents and other stakeholders also perceive risk and benefits from the remediation options that are used to address the contamination. The extent of engagement that is required with residents and other stakeholders about remediation options that are proposed for a site will in part depend on how these stakeholders weigh up the perceived risks and benefits of those options.[403] In this context, residents' benefit perceptions refer to their perceptions of the positive consequences that are caused by the use of a remediation option, which extend beyond just reducing or controlling the immediate unacceptable risks of an environmental contaminant to broader benefits such as land use opportunities that not only benefit the needs of current generation but also future generations.[404]	**Q** Is the engagement plan sensitive to how the residents and other stakeholders perceive risk and benefits from the remediation options that may be used to address the contamination at the site? And in particular the preferred options?
	R3.6	**Engaging with risk and benefit perceptions:** Whilst expert views on the risks and benefits of remediation options are important, in recent decades, more inclusive and participatory approaches have been used to choose remediation options based on the perceived benefits and risks identified by a multitude of stakeholders including local residents. The argument here is not that residents' views of risks and benefits are more important than those of experts, but that they provide alternative knowledges of risks and benefits that may be useful for developing remediation strategies. This argument is based on an understanding that it is impossible for any one perspective, discipline or approach to provide the best answers and solutions to complex environmental challenges, and that the development of useful remediation solutions requires pluralism in knowledges and approaches.[405]	**Q** Does the engagement plan consider how stakeholders' perceived risks and benefits of the proposed remediation and ongoing management options will be considered during the selection of remediation and ongoing management options for the site? *The socio-political risks associated with not doing this are discussed below in Table 5.*

CHECKLIST : R3 (continued)

Stakeholder consideration	Code	Existing guidance and evidence to support the plan's development	Questions to consider as you develop your plan
Interconnected nature of stakeholders' perception of risks and benefits, and support	**R3.7**	**Inverse relationship between perceived benefits and risks:** Residents' perceptions of the levels of risk and levels of benefit are inversely related for remediation options. For example, remediation options judged by residents as having higher perceived risk like chemical remediation options are judged to be low in benefit, and those judged higher in perceived benefit such a bioremediation options are judged low in risk.[406]	**Q** Is the engagement plan sensitive to the inverse relationship that exists between the perceived level of risk and the perceived level of benefit that residents and other stakeholders hold for remediation options?
	R3.8	**Weighing up risks and benefits, and acceptance:** How residents weigh up the risks and benefits of a remediation option influences their levels of support for a particular approach. Research shows that those who believe the risks outweigh the benefits of an option are less supportive of the approach than those who believe the risks and benefits of an option are equal, who in turn are less supportive than those who believe the benefits outweigh the risks.[407]	**Q** Is the engagement plan sensitive to how residents' and other stakeholders' assessments of the risks and benefits of a remediation option influence their levels of support for that remediation option?
Factors affecting how stakeholders perceive and support remediation options	**R3.9**	**Reputational effect:** The reputational effect (level of stigma) associated with different types of remediation options affect residents' levels of worry, perceived risk and benefit and support for different remediation options. Residents tend to be more worried about the application of chemical remediation options than the application of physical and thermal remediation options, which in turn cause more worry than bioremediation options.[408] Furthermore, remediation options judged by residents as having higher risk, like chemical remediation options, tend to be judged to be low in benefit, and those judged higher in benefit such a bioremediation options tend to be judged to be low in risk.[409] Finally, residents are more supportive of the application of bioremediation options than they are of chemical remediation, thermal remediation and physical remediation options. Overall, chemical remediation options have the highest stigma effect and they need better levels of environmental quality improvement in order to be accepted by the residents over other types of remediation options.[410] For instance, it has been found that a resident will favour bioremediation options over chemical remediation options with the same impact on objective environmental quality levels (e.g. air and water quality). In fact, residents have been found to prefer bioremediation options over any other types of remediation when the level of environmental quality improvement is similar. Physical and thermal remediation have similar levels of acceptance among residents, whilst chemical remediation has the lowest level of acceptability.	**Q** Is the engagement plan sensitive to the reputational effect (level of stigma) that is attributed to different types of remediation options by residents and other stakeholders, and the impact this reputational effect has on the residents' and other stakeholders' levels of worry, risk and benefit perception, and support for different types of remediation options?

Stakeholder consideration	Code	Existing guidance and evidence to support the plan's development	Questions to consider as you develop your plan
Factors affecting how stakeholders perceive and support remediation options	**R3.10**	**Effectiveness:** Residents often equate a remediation option's effectiveness with the 100% removal of the contamination. Given this association, engaging with residents about a remediation option's effectiveness can be challenging in situations where full (100%) remediation of a contaminant at a site is not warranted, feasible or reasonable, and an ongoing management plan is used to ensure that appropriate environmental and health management and monitoring practices are implemented at the site.[411] Residents have been found to be concerned about the effectiveness of a remediation option, in particular the option's ability to either mitigate the risk of the contaminant or remove '100% of the contaminant'.[412] A frequently reported benefit of the application of remediation options by residents is their ability to successfully eliminate an environmental contaminant (100% removal), or restrain or block its exposure pathway to receptors. Conversely, residents also perceived risks in the failure of a remediation option to effectively remediate a site, with respondents speaking about the risks that may result to the environment and human health if the remediation option is unable to effectively block or eliminate an exposure pathway to receptors from existing environmental contaminants, or to amplify exposure to an existing environmental contaminant.[413] Also, a resident's support of a remediation option is guided by its perceived effectiveness, in particular the option's perceived ability to eliminate an environmental contaminant, or restrain or block its exposure pathway to receptors.[414] An ongoing challenge in remediation planning is how the industry engages with stakeholders about the 'effectiveness' of a remediation option and the extent of remediation required at a given site.[415]	**Q** Does the engagement plan consider how residents might be concerned about the effectiveness of the selected remediation option? Does the plan consider how residents' perceptions of the effectiveness of an option affect the perceptions of the level of risk or benefit, and level of support, that they have of that remediation option?
	R3.11	**Safety:** Research has found that residents use their perceptions of a remediation option's level of safety as a means of assessing the level of risk or benefit of that option to human health or their local environment.[416] Furthermore, residents often use a remediation option's perceived safety to decide their level of support for the application of that option at the site. Perceived safety influences residents' support of remediation options in two main ways: 1) residents often declare their support for one remediation option in preference to another based on their perceptions of safety for the option, and 2) they will not support a remediation option unless it can be shown that the option is safe.[417]	**Q** Does the engagement plan consider how residents' perceptions of the safety of a remediation option affect the level of risk or benefit that they attribute to that option? **Q** Does the plan consider how residents' support of a remediation option's application at the site is affected by the remediation option's perceived safety?

CHECKLIST : R3 (continued)

Stakeholder consideration	Code	Existing guidance and evidence to support the plan's development	Questions to consider as you develop your plan
Factors affecting how stakeholders perceive and support remediation options	**R3.12**	**Economy:** The economy of the remediation option is a source of worry for some residents and other stakeholders. Residents' perceptions of a remediation option's economy are not concentrated solely on the monetary cost of the option; they are also worried about the environmental costs and benefits of an option stemming from waste production, energy usage, resource usage, and greenhouse gas emissions.[418]	**Q** Does the engagement plan consider how residents might be affected by their level of worry for the economy of a remediation option?
	R3.13	**Containment:** Residents and other stakeholders have been found to be worried about the containment of the contaminant during the application of the remediation options, and the side-effects and by-products of the remediation option and its potential to become a 'future contaminant too'. Containment has been found to be one of the most frequently stated sources of worry for thermal and physical remediation options. For physical remediation options, worry was found to be focused on the ability of remediation options such as encapsulation or immobilisation to "conceal", "contain" and "hold" the contaminated material. For thermal remediation options worry was focused on the containment of "vapours".[419] Residents use their perceptions of a remediation option's ability to contain the contaminant during application, or of the risk of it generating side effects as a means of assessing the level of risk or benefit of that option to human health or their local environment. Failure to contain a contaminant is more frequently reported as a perceived risk by residents for thermal and physical remediation options. For physical remediation options, the risk focused on is the possible failure of remediation options such as encapsulation or immobilisation to conceal, contain and hold the contaminated material over time.[420] Residents have been found to frequently highlight how their support for the application of a remediation option was contingent on its perceived ability to contain the contaminant during application, or the side effects of its application. Perceived lack of containment has been found to be a frequently reported reason for residents withholding support for the application of thermal and physical remediation options.[421]	**Q** Does the engagement plan consider how residents and other stakeholders might be worried about a remediation option's ability to contain the contaminant or its possible side effects? **Q** Does the plan consider how residents' perceptions of a remediation option's ability to contain the contaminant, or its possible side effects, affects the level of risk or benefit, and support for that option?

CHECKLIST : R3 (continued)

Stakeholder consideration	Code	Existing guidance and evidence to support the plan's development	Questions to consider as you develop your plan
Factors affecting how stakeholders perceive and support remediation options	**R3.14**	**Controllability:** It has been found that residents' perceived levels of control of remediation options is influenced by their general perceptions of the ability to control technologies. For instance, those residents who generally believed that technologies were 'out of control' are more likely to be concerned about the application of remediation options in their local area, than those who believe technologies are generally controllable.[422] Similarly, residents' general beliefs about the controllability of technologies affected their perceptions of a remediation option's perceived risks and benefits to human health. Those residents who generally felt technologies were out of control were more likely to perceive a remediation option to be a risk to human health. Conversely, those who believe that technologies are controllable were significantly more likely to believe that remediation options will benefit human health. Residents were found to be particularly concerned about the controllability of emergent remediation technologies such as nanoremediation.[423]	**Q** Does the engagement plan consider how residents' beliefs about the controllability of technologies affects their level of concern for a remediation option, and their perceptions of the levels of risk and benefit of the remediation option to human health?
	R3.15	**Treatment location:** The treatment location (onsite in-ground, onsite out-of-ground, offsite) of a remediation option has been found to have a highly significant effect on the degree to which residents are concerned about the remediation option. Residents' stated preferences for the location at which the contaminated material is treated, for example onsite in-ground, onsite out-of-ground or offsite, are consistent with their level of concern, support and risk/benefit perception for specific remediation options. For example, residents who have a preference for offsite treatment are significantly less likely to be concerned about and more supportive of remediation options that involve offsite treatment. These residents also perceived less risks and were more likely to perceive benefits to human health and the local environment for that remediation option.[424]	**Q** Does the engagement plan consider how residents might be concerned about the treatment location of remediation options? **Q** Does the plan consider that their preferences for treatment location are consistent with their level of concern, support and risk/benefit perceptions for specific remediation options?

CHECKLIST : R3 (continued)

Stakeholder consideration	Code	Existing guidance and evidence to support the plan's development	Questions to consider as you develop your plan
Factors affecting how stakeholders perceive and support remediation options	R3.16	**Sense of place:** Research has found that a residents' sense of connection to the local community and environs have an effect on the degree to which they are concerned about the application of remediation options in their local area. Those who felt a connection to their local community and environs were more likely to be worried about the application of remediation options than those who did not. Residents report that their attachment to place is eroded as their sense of place has changed as a result of the contamination. Following contamination, residents can perceive their neighbourhood to be unnatural, damaged, unsafe, or insecure, which compares to before the contamination when it was perceived as natural, clean, safe and secure.[425]	**Q** Does the engagement plan consider how a resident's or other stakeholder's sense of place may affect their level of concern about the application of a remediation option in the local area?
	R3.17	**Impact of contamination on every day lifescape:** The extent to which the contaminant impacts on the daily life of the resident at home and in the local community influences the degree to which they are concerned about the application of remediation options in their local area. Where contamination at the local site features in the daily life of a resident, they are more likely to be concerned about the application of remediation options in their local area.[426] The extent to which the contamination at the local site impacted a resident's daily life influenced the level of risk that they believed remediation options posed to human health and to their local environment. Those who believed that contamination at the local site featured in their daily lives perceived greater risk from the use of remediation options to human health and to the local environment. However, the belief that contamination at the local site features in one's daily life did not influence residents' perceptions regarding the benefit to human health or the environment from remediation options.[427]	**Q** Does the engagement plan consider the extent to which the contaminant impacts on the daily lives of residents? ■ How does this impact affect a resident's level of concern about the application of remediation options in their local area?

CHECKLIST : R3 (continued)

Stakeholder consideration	Code	Existing guidance and evidence to support the plan's development	Questions to consider as you develop your plan
Factors affecting how stakeholders perceive and support remediation options	**R3.18**	**Transportation:** The question of whether the remediation approach involves transportation of contaminated materials (e.g. truck traffic) may affect the extent of engagement.[428] Residents who are supportive of the contaminant being transported through local streets have been found to be more likely to be concerned about remediation options, and the risk to both environmental and human health[429]; however, those residents were less likely to perceive a benefit to both environmental and human health, or support the application of remediation options.[430, 431] Residents expressed concerns about the transportation of the contaminant through the streets as it would come close to local homes and be a potential risk to families and the community.[432] However, some residents support transporting the contaminant as a solution because it removes it from the local area.[433] When engaging with residents and other stakeholders about the transportation of contaminants and contaminant waste, consideration should be given to any waste management plan and report that has been developed for the site. The waste management plan and report details issues such as waste classification and compliance with the waste regulation, where it will go, and how it will be treated and transported.[434]	**Q** Does the engagement plan consider whether transportation of the contaminant is required for the remediation option(s) adopted for the site? ■ Will the material be transported past a resident's home or past sensitive sites (e.g. schools, childcare centres)? **Q** Does the plan consider how this impact may affect a resident's level of concern, their risk and benefit perceptions, and their support for a remediation option?
	R3.19	**Unproven:** Research has found that residents and other stakeholders are often concerned about whether remediation options have been proven, whether they have been "tested first", "trialled" or "researched" and whether there is "evidence of success".[435] Residents often withheld support for remediation options that they perceived as unproven, particularly emergent remediation options like nanoremediation and phytoremediation, and often only supported remediation options that had been successfully trialled.[436]	**Q** Does the engagement plan consider how residents' support of a remediation option is affected by whether they perceive them to be proven or not?

CHECKLIST : R3 (continued)

Stakeholder consideration	Code	Existing guidance and evidence to support the plan's development	Questions to consider as you develop your plan
Factors affecting how stakeholders perceive and support remediation options	**R3.20**	**Duration of remediation option(s):** The duration of a remediation option can be a source of concern for residents and other stakeholders. Two notable dimensions of their concern include: the time that it takes to complete the remediation, and whether the remediation approach is potentially transferring the problem to future generations.[437] The perceived duration of a remediation option affects a resident's level of support for that option. Two dimensions of an option's duration influenced residents' levels of support for it: the perceived long period of time that it takes some remediation options take, and the perception that some remediation options are only short-term solutions that transfer the problem to future generations. Perceived duration is a more frequently stated reason for residents to withhold support for physical remediation options and bioremediation options.[438]	**Q** Does the engagement plan consider how residents might worry about the duration of the application of the remediation option? **Q** Does the plan consider how residents' support of a remediation option is affected by how they perceive the duration of the option?
	R3.21	**Naturalness:** The perceived naturalness of a remediation option can affect a resident's level of concern, their risk and benefit perceptions, and their support for the remediation option. Residents who agree that natural methods should be used in remediation are more likely to be concerned about the application of remediation options. This finding reflects broader technology research that has identified naturalness as an important factor that influences people's perceptions of technologies such as those used in remediation options. The importance of 'naturalness' is a significant predictor for residents concern for all remediation options, with concerns most acutely associated with chemical remediation options and least associated with bioremediation options.[439] Those who believe that natural methods should be used in remediation are more likely to perceive remediation options as a risk to the local environment.[440] Residents frequently use a remediation option's perceived naturalness as a motivation for withholding or granting support for its application.[441]	**Q** Does the engagement plan consider how residents' preferences for natural methods affect the level of concern and perceived risk, and support they attribute to remediation options?
	R3.22	**Plausibility:** The perceived plausibility of a remediation option is a source of concern for residents. Plausibility is a more frequently stated source of concern for what are perceived as emergent remediation options (e.g. phytoremediation and nanoremediation).[442] The perceived plausibility of a remediation option affects whether residents support or withhold support for its application.[443]	**Q** Does the engagement plan consider how a resident's concern and support for a remediation option is affected by whether they perceive it as plausible?

CHECKLIST : R3 (continued)

Stakeholder consideration	Code	Existing guidance and evidence to support the plan's development	Questions to consider as you develop your plan
Factors affecting how stakeholders perceive and support remediation options	**R3.23**	**Controversial:** The question of whether the stakeholders perceive the remediation options or ongoing management proposed for use at the site as controversial can influence the extent of engagement.[444]	**Q** Have you considered whether the remediation options or ongoing management are perceived as controversial by stakeholders?
	R3.24	**Trust:** Research shows that the stakeholders' trust in companies and industry organisations, and government agencies and regulators, influences the degree to which they worry about the application of remediation options in their local area and the level of risk they associate with these remediation options. This research highlights that: ▸ Stakeholders who are less trusting of these organisations are more likely to be worried about the application of remediation options. Those who have greater trust in these types of organisations are less likely to worry about remediation options. ▸ Stakeholders who are more trusting of these organisations perceived lower levels of risk, both for human health and for their local environment. Conversely, individuals who are more trusting of these organisations perceived greater benefit from remediation options both to the residents' health and to the local environment.[445]	**Q** Does the engagement plan consider that a stakeholder's level of worry and risk for the application of remediation options in their local area is closely linked to their level of trust in the organisations that are responsible for the regulation and implementation of the remediation approach?
Negotiating support	**R3.25**	**Pliability of stakeholder support:** A resident's level of support for remediation options can be understood as being pliable (Wong, 2015). This pliability is driven by a series of norms which guide a resident's willingness to negotiate their level of support during engagement with government and remediation service providers. These norms are understood as being motivated by the factors discussed above, and as being concomitant with a series of sanctions (rules) that residents may enact if norms are not respected. These sanctions (rules) may have socio-political risks for those seeking to apply remediation options at a site without the support of residents.	

CHECKLIST : R3 (continued)

Stakeholder consideration	Code	Existing guidance and evidence to support the plan's development	Questions to consider as you develop your plan
Negotiating support	**R3.26**	**Statements used by stakeholders to negotiate support:** Residents use a common set of statements to indicate their willingness to shift from withholding to granting support for remediation options. Whilst residents identified the proponent, the consent authority, the certified contaminated land consultant, the local government, independent experts and an auditor as the appropriate entities to whom they should address these statements, there was a preference for them to be answered by an independent expert. These statements could be separated into three key types. ▸ The first type of statement (see statement 1, Table 5) disclosed a resident's willingness to shift from withholding to granting support upon the provision of evidence (i.e. information or demonstration) that a remediation option has certain desired characteristics e.g. the containment of gases, treatment will be onsite. ▸ The second type of statement (see statements 2 to 4, Table 5) reveals a resident's willingness to shift from withholding to granting support for a remediation option based on the provision of evidence (i.e. information or demonstration) to the resident about the range of remediation options that can be used at the site. ▸ The third type of statement (see statements 5 to 11, Table 5) highlights how a resident's shift from withholding to granting support for a remediation option may be enabled through certain roles and responsibilities being carried out by certain stakeholders in the process.[446]	**Q** Is the engagement plan sensitive to the types of questions that residents ask when deciding whether to shift from withholding to granting support for the application of remediation options?
	R3.27	**Statements used by stakeholders to refuse support:** Research has found that stakeholders use two types of statements to explain why they refused to grant support for the application of remediation options. ▸ Residents indicated that they would not provide their support for a selected remediation option due to perceived characteristics that amplified its risks (see statement 12, Table 5). ▸ Residents indicated that they were not willing to support any remediation options at the site due to risks that they perceived were innate to all options (see statement 13, Table 5).[447]	**Q** Is the engagement plan sensitive to the types of statements that residents make when they do not wish to support remediation options?

CHECKLIST : R3 (continued)

Stakeholder consideration	Code	Existing guidance and evidence to support the plan's development	Questions to consider as you develop your plan
Negotiating support	**R3.28**	**Possible social sanctions:** Where stakeholders do not support the application of remediation options in their local area, and a responsible party proceeds with its application at a site, some residents may respond by imposing social sanctions. Tangible forms of these social sanctions include: ▸ inhibiting the movement of those carrying out the remediation, through e.g. restrictions on access to neighbouring properties and communities near the site ▸ lodging objections through formal regulatory processes ▸ instigating economic sanctions or restrictions on specific actors carrying out the remediation process ▸ protesting against the application of the selected remediation type ▸ generating political sanctions e.g. through engaging with political figures ▸ drawing attention to the actions of those carrying out the remediation with support of the media as a deterrent, with the aim of adversely impacting their reputation, profits or stability. The implementation of these social sanctions may pose significant socio-political risks to those carrying out remediation practice at a given site.[448]	**Q** Does the engagement plan consider the socio-political risks that may stem from implementing remediation options that are not supported by residents?

Table 5. Statements commonly used by stakeholders to provide or withhold their support for the application of remediation options

Notes:

1. *'All' includes proponent, regulatory authority, certified contaminated land consultant, local government, auditor, and independent expert.*
2. *'Evidence' includes explanation, information, demonstration.*
3. *'remedial option A' is the remedial option under consideration.*
4. *'remedial options B, C, D' are other remedial options that might be considered.*

Part 1: Statements 1 through 11 – for negotiating level of support

Statement 1: All[1], but with preference for an independent expert must provide evidence[2] that remediation option A[3] ...

... can contain the contaminant and/or by-products of the remediation process

... is safe

... is effective

... is proven

... is at a preferred location e.g. on-site-in-ground, on-site-out-of-ground, off-site

... is natural

... is economical

... is of a preferred duration e.g. long-term or short-term

... does not include transporting contaminated materials through local streets

... will generally work

... accords with their values

... is beneficial to humans, ecosystem services, and the environment

... is not a risk to humans, ecosystem services, and the environment

before option A is applied in the local area

Statement 2: All[1], but with preference for an independent expert must provide evidence[2] that remediation option A[3] when compared to other remediation options B, C, D[4] that can be applied at the site is ...

... as or more able to contain the contaminant and/or by-products of the remediation process

... as safe or safer

... as or more effective

... as or more proven

... at a preferred location, e.g. on-site-in-ground, on-site-out-of-ground, off-site

... as or more natural

... as or more economical

... of a preferred duration, e.g. long-term or short-term

before remediation option A[3] is applied in the local area

Table 5. (continued)

Statement 3: All[1] may apply remediation option A[3] in the local area, but would prefer remediation option B, C, D [4] because it is ...

... more able to contain the contaminant and/or by-products of the remediation process

... safer

... more effective

... more proven

... at a preferred location, e.g. on-site-in-ground, on-site-out-of-ground, off-site

... more natural

... more economical

... of a preferred duration, e.g. long-term or short-term

Statement 4: All[1] must use remediation option A[3] in conjunction with remediation option B, C, D[4] because of concerns about remediation option A's ...

... ability to contain the contaminant and/or by-products of the remediation process

... safety

... effectiveness

... proven use

... location e.g. on-site-in-ground, on-site-out-of-ground, off-site

... naturalness

... economy

... duration e.g. long-term or short-term

before remediation option A[3] is applied in the local area

Statement 5: [Certified contaminated land consultant, regulatory authority or proponent must address the resident's uncertainty about remediation option A[3] by providing guarantees about its ...

... ability to contain the contaminant and/or by-products of the remediation process

... safety

... effectiveness

... proven use

... location e.g. on-site-in-ground, on-site-out-of-ground, off-site

... naturalness

... economy

... duration e.g. long-term or short-term

before remediation option A[3] is applied in the local area

Statement 6: All[1] must not apply remediation option A[3] in the local area without first providing residents with evidence[2] of other possible remediation options B, C, D[4] that can be used in the local area.

Table 5. (continued)

Statement 7: All[1] must provide a truthful and transparent step-by-step explanation of remediation option A[3]'s application e.g. what is being remediated, who is doing it, how it will be done, and where it will be done before remediation option A[3] is applied in the local area.

Statement 8: Certified contaminated land consultant must agree to ...

... keep residents informed about the selection and application of remediation option A[3]

... provide ample stakeholder engagement about remediation option A[3]

before remediation option A[3] is applied in the local area

Statement 9: The regulatory authority and local government must regulate the application of remediation option A[3] before the remediation option is applied in the local area

Statement 10: Independent expert must validate evidence about remediation option A proposed by the problem holder before remediation option A[3] is applied in the local area

Statement 11: The proponent must not provide evidence about remediation option A3 without verification from an independent expert before remediation option A[3] is applied in the local area

Part 2: Statements 12 through 13 – for not negotiating level of support

Statement 12: All[1] must not apply remediation option A[3] in the local area because it ...

... is unable to contain the contaminant and/or by-products of the remediation process

... is unsafe

... is ineffective

... is unproven

... occurs at a certain location e.g. on-site-in-ground, on-site-out-of-ground, off-site

... is unnatural

... is uneconomical

... is of a duration e.g. long-term or short-term

... includes transporting materials through local streets

... is a type of remediation option e.g. chemical, physical, thermal, bio

Statement 13: All[1] must not apply any remediation options A[3] or B, C, D [4] in the local area because its application does not accord with a resident's motivational values e.g. nature knows best, and all human intervention in nature is wrong

CASESTUDY 5

How effective engagement helps to lower residents' perceived risk regarding the application of types of remediation options: ICI Dulux paint factory site at Cabarita

CONTEXT

Timeframe	1994–1996
Site	ICI Dulux paint factory site at Cabarita, Inner West Sydney, New South Wales
Contaminant(s)	Industrial waste, including solvent and lead
Selected remediation option	Soil washing and on-site containment
Issue	Perceived risks and benefits of different types of remediation options
Related checklist	**Checklist R3** Does the plan consider how residents and other stakeholders perceive the risks and benefits of remediation and ongoing management options, and their levels of acceptance of these options?

LESSONS LEARNED

- **Residents' opinions and preferences regarding the application of remediation options are an important consideration when planning remediation works.**
- **Residents are more likely to associate bioremediation options with lower risk to environmental and human health than chemical remediation options, but effective engagement can help reduce levels of perceived risk associated with chemical remediation options.**
- **Good practice involves giving residents the space to discuss and consider the risks and benefits associated with different remediation options.**

Situation

By 1994, the former ICI Dulux paint factory in Cabarita, Inner West Sydney, New South Wales, had been home to ICI Dulux for over 75 years. Throughout this period, paint products had been manufactured onsite, including lead paints. Most of the industrial waste had been buried onsite, significantly contaminating the soil and the adjacent waters. Paint production ended on the site in December 1994.[449] In 1994, investigation into contamination began and found that lead levels in the soil were seven to ten times the maximum allowable levels in Australia at that time.[450]

Actions Taken

In 1996, ICI Dulux announced the launch of a soil-washing decontamination project for the site. The manager of contaminated sites for the Environment Protection Authority praised Dulux's plans for remediation in the Sydney Morning Herald. As the site involved lead contamination, strict precautions over access to the area were put in place.[451] The remediation project included the demolition of more than 30 buildings onsite, with most building materials (timber, bricks, and concrete, steel) being decontaminated and recycled for other projects.[452] The world's largest soil decontamination plant was installed onsite to carry out soil-washing. The plant cleaned and re-used up to 80% of the 140,000 tonnes of polluted

soil. Contaminated residues were also stabilised in concrete and dumped in landfills. The treatment plant was able to reduce the lead levels in the soil from between 2000 and 3000 parts per million (ppm) to levels of between 150 and 200 ppm, the maximum allowed under Australian regulations.[453] The project was successfully completed and the former industrial site was transformed into a medium-density housing development.[454]

Soil washing uses liquids, usually water, combined with chemical additives and a mechanical process to scrub the soil. The scrubbing reduces hazardous contaminants and concentrates them into a smaller volume. Soil washing is advantageous as it provides a closed system that remains relatively unaffected by external conditions. It allows hazardous wastes to be treated onsite and the process can remove a wide variety of contaminants.[455] It is also regarded as being cost effective. However, this method is also associated with several disadvantages including the fact that it requires high chemical and electricity demands to operate.[456] Acid-based chemical extraction processes are also associated with increased risks of environmental pollution occurring during the soil washing process. Soil washing also requires a large area to set up the system and the used wastewater may need more specialised treatment to move chemicals and chemical additives. At the end of the process, amounts of contaminated sludge can remain and require further treatment. Air emissions from cleaning equipment are another significant source of concern.[457]

Significant efforts were made to engage with members of the public during the decision-making process. Efforts were made to consider resident opinions and preferences regarding the application of remediation options and resistance to the chosen option was slow. The local council and community were kept informed about the actions and investigations. Residents were invited to voice any concerns or questions that they had about the safety of the selected option. Questions raised were quickly addressed by official organisations involved in the remediation activities.

Outcomes

Residents favoured the effectiveness and ability of soil washing to limit prolonged exposure to contaminants during the remediation process. Concerns about the potential of by-products to affect environmental health were not seen to outweigh the benefits of using soil washing to remediate the site.

Conclusion and recommendations

Previous research has shown that how residents perceive the risks and benefits of the application of remediation options to address contamination is dependent upon a number of variables, including the characteristics of remediation options.[458] One particular characteristic that influences resident perception is the ability of a particular a remediation option to contain the contaminant, with bioremediation options being more likely to be perceived as being less harmful and more beneficial to the environment than chemical, thermal or physical remediation options.4[59, 460, 461] In contrast, thermal and chemical options are more likely to be associated with greater levels of risk of harm to the local ecosystem.[462] However, research has also shown that residents balance the benefits to environmental health against their concerns for human health.[463] Thus, while chemical and thermal remediation options can be perceived as being less beneficial for the environment than bioremediation options, they may be perceived to be the preferable option for ensuring less risk to human health. This is because these methods are seen to be quicker, and as ensuring less exposure over time than bioremediation and physical remediation options. Physical remediation options, such as dig and dump and stabilisation, are often viewed as unfavourable because they are perceived to potentially put the health of future generations at risk and as risking the unintentional creation of additional exposure pathways that could lead to harm for human and environmental health. Chemical remediation options are especially associated with a lack of ability to contain the contamination during remediation activities. Concern about by-products, such as emissions, and waste-products of remediation, means that chemical remediation options are often associated with higher levels of risk compared to other types of remediation options.[464, 465, 466.]

At Cabarita, engagement with the community was argued to have reduced resistance to the redevelopment to a minimum, and the redevelopment application was processed with few objections.[467] Keeping the local council and community well informed about the actions and investigations helped to ensure that the remediation went ahead quickly and any questions that residents had about the safety of the selected remediation option were quickly addressed. The lack of resistance shown toward the proposed use of soil washing suggests that people felt that they had been adequately informed about the benefits of the remediation and perceived the benefits of this form of remediation to outweigh the potential risks. Good practice therefore involves giving residents opportunities to discuss and consider the risks and benefits associated with different remediation options.

STEP 5

Identify the level(s) of engagement and the engagement techniques, and deliver the engagement plan

IN THIS SECTION

STEP 5

Identify the level(s) of engagement and engagement techniques, and deliver the engagement plan

➨ Introduction

Step 4 of the guide is designed to help the user identify the level(s) of engagement and the engagement techniques for the stakeholder engagement plan, and to help the user deliver the plan.

The development of a stakeholder engagement plan requires the identification of the level(s) at which stakeholder will be engaged, the different techniques that will be used to deliver the plan, and the human resources and financial resources needed to deliver them. The plan should detail how barriers to engagement will be removed and ensure stakeholder issues, concerns, questions and information raised are they effectively managed, recorded and responded to with clear and consistent messages. The developed plan also needs to identify how the reporting and evaluation will be carried out during the implementation of the plan, as well as after the conclusion of the plan.

Step 5 contains three checklists which help the user address three key questions. We first detail the three key questions that guide the three checklists in this step, and then present the checklists. The letter "**E**" in used to identify the checklists in Step 5, and is a reference to the step's focus on level(s) of **E**ngagement and **E**ngagement techniques. The checklists within this step present existing evidence[468] and guidance[469] and associated questions to help the user identify and consider the effect of the remediation and ongoing management on residents and other stakeholders.

➨ Key questions

Does the plan:

identify the level(s) of engagement and the engagement techniques that will be used to deliver the plan, and the resources needed to support the plan's delivery?

consider how the engagement techniques will be delivered?

consider the need for reporting, updating and ongoing evaluation?

CHECKLIST E1

Does the plan identify the level(s) of engagement and the engagement techniques that will be used to deliver the plan, and the resources needed to support the plan's delivery?

When identifying the most appropriate ways in which to engage stakeholders, consideration should be given to: 1) the level of the engagement (e.g. to inform or to involve in decision-making), 2) engagement techniques to be used, 3) the human resources (staffing, expert consultants, volunteers, stakeholder capacity), and 4) financial resources (budget) needed to deliver them.

CHECKLIST E1

Engagement considerations	Code	Existing guidance and evidence to support the plan's development	Questions to consider as you develop your plan
Spectrum of engagement	**E1.1**	**Select the appropriate level(s) of engagement:** The spectrum of engagement can be used to help clarify the role of stakeholders in planning and decision-making associated with the contaminated site, and how much influence the stakeholders will have over planning or decision-making processes associated with a contaminated site. The spectrum of engagement identifies five levels of stakeholder engagement: inform, consult, involve, collaborate, or empower (each discussed below in detail).[470] It is important to recognise that these are levels of engagement, not steps. The spectrum of engagement moves from the lowest level of stakeholder engagement, which is simply to inform, through consult, involve, collaborate, to the highest level of engagement which is empower (each discussed below in detail). The further up the spectrum, the more influence the stakeholders have over decisions, and each level can be appropriate depending on the context. Higher levels are not necessarily better. For example, if stakeholders will not have an opportunity to influence decision-making, it is important to make this clear to them. Inappropriate engagement is counterproductive and increases apathy and cynicism on the part of stakeholders. Selecting a level of engagement does not mean that the level cannot change over time (e.g. it might be discovered that an issue is more controversial than thought, so a higher level might be adopted). Nor is the selected level the only one that can be used. It can be quite appropriate to provide ways of engaging some stakeholders at lower levels and others at higher levels.	**Q** Have you considered the level of influence that stakeholders are willing and able to have over planning or decision-making processes associated with a contaminated site and its remediation and ongoing management?

CHECKLIST E1 (continued)

Engagement considerations	Code	Existing guidance and evidence to support the plan's development	Questions to consider as you develop your plan
Levels of engagement	**E1.2**	**Inform:** When the purpose of engagement activities is to inform the stakeholders, the goal is to provide the stakeholders with balanced and objective information to assist them in understanding issues, alternatives, opportunities and/or solutions. Informing is generally used within engagement activities when: ▸ a decision has already been made or there is no opportunity for stakeholders to influence the final outcome ▸ the issue is relatively simple. The commitment being made to the stakeholders at this level of engagement is "We will keep you informed over time". **The role of stakeholders at the inform level is to listen.** The following engagement techniques have been used in engagement processes at NSW contaminated sites to inform residents and other stakeholders (see Table 6 for more detail): ▸ printed information/letter box drops/information bulletins ▸ exhibitions and displays/pop-up kiosks/shopfront displays ▸ websites/social media ▸ advertorials ▸ project emails ▸ hotlines/1800 community line ▸ on-site meetings ▸ public meetings/community briefings.	**Q** Is the purpose of the plan's engagement to inform stakeholders? **Q** What engagement techniques will be used to inform stakeholders?

CHECKLIST E1 (continued)

Engagement considerations	Code	Existing guidance and evidence to support the plan's development	Questions to consider as you develop your plan
Levels of engagement	**E1.3**	**Consult:** When the purpose of engagement activities is to consult with stakeholders, the goal is to obtain stakeholder feedback on analysis, alternatives and/or decisions. Consulting is used within engagement activities when: ▸ decisions are still being shaped ▸ there may not be a firm commitment to do anything with the views collected – and this is clearly communicated. The commitment being made to the stakeholders at this level of engagement is: "We will keep you informed, listen to and acknowledge your concerns, and provide feedback on how stakeholder input influenced the decision". **The role of stakeholders at this level is to contribute.** The following engagement techniques have been used within engagement processes at NSW contaminated sites to consult residents and other stakeholders (see Table 6 for more detail): ▸ pop-up kiosks ▸ focus groups ▸ surveys ▸ on-site consulting ▸ community reference/advisory groups.	**Q** Is the purpose of the plan's engagement to consult stakeholders? **Q** What engagement techniques will be used to consult stakeholders?

CHECKLIST E1 (continued)

Engagement considerations	Code	Existing guidance and evidence to support the plan's development	Questions to consider as you develop your plan
Levels of engagement	**E1.4**	**Involve:** When the purpose of engagement activities is to involve the stakeholders, the goal is to work directly with the stakeholders throughout the process to ensure their concerns and aspirations are consistently understood and considered. Involving stakeholders is used within engagement activities when: ▸ There is a need for two-way discussion amongst, and with, stakeholders. ▸ There is a real opportunity for stakeholders to influence the final outcome. The commitment being made to the stakeholders at this level of engagement is "We will work with you to ensure that your concerns and aspirations are directly reflected in the alternatives developed and provide feedback on how public input influenced the decision". **The role of stakeholders at this level is to participate.** The following engagement techniques have been used in engagement processes at NSW contaminated sites to inform residents and other stakeholders (see Table 6 for more detail): ▸ workshops ▸ focus groups ▸ community reference/advisory groups.	**Q** Is the purpose of the plan's engagement activities to involve stakeholders? **Q** What engagement techniques will be used to involve stakeholders?

CHECKLIST E1 (continued)

Engagement considerations	Code	Existing guidance and evidence to support the plan's development	Questions to consider as you develop your plan
Levels of engagement	**E1.5**	**Collaborate:** When the purpose of engagement activities is to collaborate with stakeholders, the goal is to partner with stakeholders in each aspect of decision-making, including the development of alternatives and the identification of the preferred solution. Collaborating with stakeholders is generally used within engagement activities when: ▸ There is a need for stakeholders to talk to each other regarding complex, value-laden issues. ▸ There is capacity for stakeholders to shape decisions that affect them. The commitment being made to the stakeholder at this level of engagement is "We will work together with you to formulate solutions and incorporate your advice and recommendations into the decisions to the maximum extent possible." **The role of stakeholders at this level is to partner.** The following engagement techniques have been used in engagement processes at NSW contaminated sites to collaborate with residents and other stakeholders (see Table 6 for more detail): ▸ workshops ▸ community reference/advisory groups ▸ focus groups.	**Q** Is the purpose of the plan's engagement to collaborate with stakeholders? **Q** What engagement techniques will be used to collaborate with stakeholders?

CHECKLIST E1 (continued)

Engagement considerations	Code	Existing guidance and evidence to support the plan's development	Questions to consider as you develop your plan
Levels of engagement	**E1.6**	**Empower:** When the purpose of engagement is to empower stakeholders, the goal is to place final decision-making in the hands of the public. 'Empower' is generally used within engagement activities when: ▸ Stakeholders have accepted the challenge of developing solutions themselves. ▸ There is an agreement to implement solutions generated by the stakeholders. The commitment being made to the stakeholder at this level of engagement is "We will implement what you decide". **The role of stakeholders at this level is to decide.** To date, we are not aware of any engagement processes at NSW contaminated sites that have sought to carry out stakeholder engagement at the level of empowering residents and other stakeholders. This is likely due to the legislative restrictions placed on decision-making associated with the investigation, remediation, and ongoing management of contaminated lands. This does not mean that this level of engagement may not be used in the future. An example of a technique often used at this level is (see Table 6 for more detail): ▸ citizens' juries.	**Q** Is the purpose of the plan's engagement to empower stakeholders?

CHECKLIST E1 (continued)

Engagement considerations	Code	Existing guidance and evidence to support the plan's development	Questions to consider as you develop your plan
Levels of engagement	**E1.7**	**Legislative restrictions on levels of engagement:** Even when the purpose of an engagement activity is to inform, consideration needs to be given to legislative issues that may have an impact on the type and/or amount of information that can be provided. For example: ▸ Commercial-in-confidence materials should not be disclosed.[471] ▸ Privacy legislation restrains the giving out of personal information to any other person without the permission of the person named in the material in question.[472] ▸ Freedom of information (FOI) legislation means that written material held by government agencies can be requested and viewed by any citizen with an interest in that particular information (FOI covers all forms of writing, including emails and sticky notes).[473] Furthermore, most stakeholder engagement activities for contaminated sites will fall between the Inform and Collaborate levels, given the various legislative requirements for decision to be made by qualified professionals associated with a contaminated site's investigation, remediation and ongoing management. However, when legislation and circumstances permit, it may be possible to empower stakeholders by endorsing the decision of the stakeholders and committing financial resources to its implementation.	**Q** Has the plan determined the stakeholder's level of influence within the plan's engagement activities? **Q** Does the plan clearly identify where the purpose of engagement is limited or enabled through NSW Legislation?

CHECKLIST E1 (continued)

Engagement considerations	Code	Existing guidance and evidence to support the plan's development	Questions to consider as you develop your plan
Engagement techniques	**E1.8**	**Engagement techniques used at NSW contaminated sites:** There are many techniques that can be used to engage with stakeholders to create a stakeholder engagement plan. They can be used in isolation or in combination. The techniques described in Table 6 have been previously used during the engagement processes for contaminated sites in NSW.[474] Based on the experiences of engagement of consultants at contaminated sites in NSW, some of the most popular and familiar engagement techniques to residents and other stakeholders are: ▸ community walk-in information sessions ▸ public meetings/community briefings ▸ on-site meetings ▸ workshops ▸ pop-up kiosks ▸ surveys ▸ interviews ▸ 1800 community lines ▸ project emails. Information about these techniques, including their advantages and limitations, is provided in Table 6.[475] These techniques have been broken into two categories: those that are focused on engaging with individual stakeholders and those focused on engaging with groups of stakeholders.	**Q** Which engagement techniques will you use in the engagement plan?

CHECKLIST E1 (continued)

Engagement considerations	Code	Existing guidance and evidence to support the plan's development	Questions to consider as you develop your plan
Engagement techniques	**E1.9**	**Using engagement techniques to achieve the required level(s) of engagement:** How an engagement technique is used to achieve a level of engagement is just as important, if not more important, than what technique is selected. If a community reference/advisory committee is tokenistic and does not play a meaningful role in decision-making, then it is not operating at the level of collaboration. The goal of the engagement and the promise made to the stakeholders are what determine the level, not the techniques used. Many techniques can also be used for more than one level (for example community reference/advisory groups can be used at consult, involve, collaborate and empower).	**Q** What engagement techniques will the plan use to achieve the selected level(s) of engagement (e.g. inform, consult, involve)?
	E1.10	**Using passive and active engagement techniques:** Engagement experts who have facilitated engagement processes at NSW contaminated sites have highlighted the need to blend techniques that can broadly be split into two categories: 1) active, and 2) passive. Active techniques are those that involve some form of face-to-face interaction such as workshops, focus groups and community advisory groups. Passive techniques are generally there to support more active forms of engagement. They include: ▸ static displays ▸ printed information ▸ websites ▸ advertorials ▸ project emails. Engagement experts who have facilitated engagement processes at NSW contaminated sites have highlighted the need to mix active and passive forms of engagement when dealing with sites that have complex issues.	**Q** When dealing with sites with complex issues, does the engagement plan have a mix of passive and active engagement techniques?

CHECKLIST E1 (continued)

Engagement considerations	Code	Existing guidance and evidence to support the plan's development	Questions to consider as you develop your plan
Engagement techniques	**E1.11**	**Online engagement:** Engagement experts who have facilitated engagement processes at NSW contaminated sites have highlighted the need to develop a proactive approach to online engagement. Online engagement is a consistent component of contemporary engagement processes at NSW contaminated sites. There are a variety of online engagement processes to choose from, such as: project websites and project emails, online stakeholder engagement software/platforms (e.g. Social Pinpoint, Bang the Table, Have Your Say, Survey Monkey) and social media (e.g. Facebook, Twitter, Instagram, YouTube). Online engagement enables people to choose where, when and for how long they want to engage. Strengths of online engagement include: ▸ People can choose a convenient time and place to engage. ▸ It is particularly useful for those who may be homebound e.g. carers, elderly people, parents with young children. ▸ It can create debate and an exchange of views. ▸ It is cost effective. ▸ It can reach large numbers of people. ▸ it is less time consuming than attending a workshop or public meeting. Weakness of online engagement include: ▸ Some techniques may require a moderator to manage comments, and this can be expensive and time consuming. ▸ It excludes those without access to the internet. ▸ it needs to be publicised to generate interest. ▸ Some people may feel intimidated. ▸ See Table 6 for more detail.	**Q** What type of online engagement will the plan use?

CHECKLIST E1 (continued)

Engagement considerations	Code	Existing guidance and evidence to support the plan's development	Questions to consider as you develop your plan
Stakeholders resources	**E1.12**	**Stakeholder engagement needs:** It is important to ask the stakeholders about their engagement needs and whether they have the resources to engage. It is important to tailor engagement techniques to stakeholders and their capacities. They will be in the best position to tell you how you can best assist them to contribute to the engagement processes. [476] For example, some stakeholders may not have the time and energy to participate in day-long workshops held at the collaborate level, but might still want to have the opportunity to contribute their ideas.	**Q** When determining the stakeholders' levels of engagement, have you considered how much influence the stakeholders want to have? **Q** Have you asked the stakeholders you are planning to engage what resources they need to engage at different levels?
	E1.13	**Fees and reimbursements for costs:** Some stakeholders, including some Aboriginal group representatives, may require payment of a fee (e.g. for services provided) or reimbursement of costs (e.g. travel costs). Reimbursement may also be required to assist with administrative matters (e.g. drawing up an invoice on behalf of the people(s) consulted).[477]	**Q** Have you considered that some stakeholders including Aboriginal group representatives may require payment of a consultation fee, or at least reimbursement for out-of-pocket expenses?
	E1.14	**Burnout and over-engagement:** When determining the plan's engagement level(s) and engagement techniques, take into consideration the potential for 'over-engagement' and 'burnout'. Do your homework and find out what else is going on that stakeholders might be involved in, and don't have any more engagement activities than necessary.[478]	**Q** Have you considered the potential for 'over-engagement' and 'burnout' of stakeholders when developing the plan? **Q** Are all the engagement activities detailed in the plan necessary? Could you combine any activities to reduce the amount of engagement needed?

CHECKLIST E1 (continued)

Engagement considerations	Code	Existing guidance and evidence to support the plan's development	Questions to consider as you develop your plan
Human Resources	**E1.15**	**Staffing:** The staffing needed to carry out the engagement plan can range from an individual through to a team and will depend on: ▸ the size and complexity of the remediation and management process at the contaminated site, and the extent to which it is contentious ▸ the selected level(s) of engagement ▸ the number and type of engagement techniques proposed. Whether staff are from within the organisation undertaking the remediation and management project, or externally engaged consultants, it is important that whoever is involved in the planning, developing, implementing, monitoring and evaluating of the stakeholder engagement plan has the engagement skills and experience to do so. Factors to consider when building any type of stakeholder engagement team include: ▸ Effective high-level leadership is vital. ▸ There must be a commitment to openness and transparency. ▸ Personnel with skills in stakeholder engagement, facilitation, information dissemination, and knowledge of the issues are essential to keeping the engagement process on track. Enthusiasm and commitment from the team will directly impact upon the success of the engagement program.[479]	**Q** Do you have enough staff needed to carry out the level of engagement and cope with the number, size and complexity of the engagement activities detailed within the engagement plan? ■ Do these people have the competencies necessary to implement the engagement plan?

CHECKLIST E1 (continued)

Engagement considerations	Code	Existing guidance and evidence to support the plan's development	Questions to consider as you develop your plan
Human Resources	**E1.16**	**Experienced engagement consultant:** For more complex or contentious sites, or even for just some issues being addressed through the engagement plan, engagement will often achieve a better outcome if the stakeholder engagement role is undertaken by a third party such as an experienced engagement consultant. This can help to ensure a more open exchange of information and reduce tension if stakeholders are already mistrustful of those responsible for the management of the site.[480] Furthermore, when complex issues arise, or if a high level of conflict is having a continuing negative impact on the engagement process, there may be a need to access expert advice by bringing in experienced engagement consultants.	**Q** Have you considered using an experienced engagement consultant to develop, implement and evaluate the engagement plan? **Q** Have you considered the need for an experienced engagement consultant to provide advice about complex and controversial issues that may arise during the engagement process?
	E1.17	**Government:** Organisations at both local and state government levels are experiencing increased pressure from reduced budgets and may find it difficult to fully resource the range of expertise and involvement required to carry out the engagement plan.[481]	**Q** Does the plan acknowledge the capacity and resources of government organisations, including local councils, to resource their involvement in the engagement plan?
	E1.18	**Volunteers:** Volunteers often play a role in the development and implementation of engagement activities. When working with volunteers it is important to arrive early and stay late at engagement activities so you can mingle with the volunteers. Remember these people are volunteers and have other commitments that may take priority over your event. Expect a percentage to not turn up at the last minute. Some volunteers have a lot of knowledge and skills that they are willing to share. Value their contribution. Consider providing resources for travel or for covering other costs for volunteers.[482]	**Q** Does the plan acknowledge the capacity of volunteers, and does it provide the resources that volunteers may need?

CHECKLIST E1 (continued)

Engagement considerations	Code	Existing guidance and evidence to support the plan's development	Questions to consider as you develop your plan
Financial resources	**E1.19**	Financial resources: The financial resources required for carrying out the engagement plan will depend on: ▸ the size and complexity of the remediation and management process at the contaminated site, and the extent to which it is contentious ▸ the proposed level(s) of engagement ▸ the number and type of engagement techniques proposed. While it is possible to carry out effective stakeholder engagement with limited funds, keep in mind that the inclusion of third-party costs, such as fees for an external consultant to undertake the engagement program, will make a significant impact on the overall budget.[483] Some of the likely expenses associated with a stakeholder engagement plan include: advertising, venue hire, printing, postage/freight, child or respite care, parking, travel, accommodation, public address systems, stationery, consultancy, media monitoring, audio-visual equipment, translation/ interpreting services, participation payments or honorariums, and catering.	**Q** Have you developed an itemised budget to execute your engagement plan?

Table 6. Engagement techniques, including some advantages, limitations, and guidance from stakeholder engagement consultants based on their experience with engagement processes for contaminated sites in NSW.

GROUP TECHNIQUES

Techniques	Description	Advantages	Limitations	Engagement consultant's thoughts based on experience
Advisory committees/ reference groups	These committees consist of council and community representatives and are established to provide input on an ongoing basis on specific issues.	▸ Knowledgeable and are able to make recommendations about particular area/issues ▸ Convenient regular access to a group of knowledgeable community representatives ▸ A useful mechanism for checking views before going out to the wider community.	▸ Can be dominated by some individuals ▸ If there is a limit to the number of positions, the process can be seen to not represent everyone.	
Public meetings/ community briefings	Usually more than 20 participants, self-selected by advertised invitation, formalised proceedings aimed at presenting information to a large audience, conducted at a time and location to suit most people, needs to be widely publicised, requires good, fair and unbiased facilitation.	▸ Provides a forum for information dissemination and exchange with large numbers of people. ▸ May incorporate other techniques such as workshops. ▸ Brings a wide range of people together.	▸ Focused discussion on one issue is difficult. ▸ More articulate and better prepared participants may dominate. ▸ Less vocal participants may not express their views.	"Government agencies often use public meetings – and they refer to them as 'Community Briefings'. ... They usually are structured so that the proponent provides some form of presentation. ... Needs strong facilitation and ground rules to conduct them effectively."
On-site meetings	Open-air meetings held on-site or adjacent to the affected site to provide information, gauge interest and explain processes and procedures.	▸ Enables interested individuals to gain an understanding of the issues involved. ▸ Demystifies the project. ▸ Provides an opportunity to develop rapport with key stakeholders.	▸ Number of participants is limited by logistics. ▸ Accessibility to the site not always possible (e.g. for aged or disabled participants, or because of safety concerns).	"Very effective – its key advantage is allowing people to 'see' the site and get a feel for the environment, and discussions around next steps forward."

Table 6. (continued)

GROUP TECHNIQUES

Techniques	Description	Advantages	Limitations	Engagement consultant's thoughts based on experience
Workshops	Participants usually share concerns and skills, structured sessions aimed at encouraging open discussion between participants and producing proposals for solutions.	▸ **Provides opportunity for all participants to contribute.** ▸ **A flexible technique that can be used at all stages of the engagement program.** ▸ **Can provide a forum for testing alternatives, training opportunities, information gathering and dissemination, receiving feedback and refining input.**	▸ **The 'right' expert may not be available.** ▸ **Participants may not be adequately prepared.** ▸ **Experts may dominate and inhibit discussion.**	"Probably the most effective process to apply, particularly if you are trying to create ... shared ownership of the outcomes. An excellent process to enable a range of community members."
Focus groups	Discussion group between 5 and 20 people, usually led by a trained person or facilitator. The purpose is to find out the range of opinions that exist on a particular topic.	▸ **Useful for developing concepts and ideas to be tested in a quantitative survey.** ▸ **Useful for consulting with specific groups that may be underrepresented in a survey.** ▸ **Interactions between respondents can increase richness of information collected and enhance understanding.**	▸ **Need a suitable location.** ▸ **Need to coordinate a group of people to be all available at the same time.** ▸ **Respondents can deviate from topic.** ▸ **Expensive per group.** ▸ **Not cost-effective if a large sample is required to be representative.**	

Table 6. (continued)

GROUP TECHNIQUES

Techniques	Description	Advantages	Limitations	Engagement consultant's thoughts based on experience
Morning and afternoon "tea and chat" sessions/ kitchen table discussions	Small meetings within the local community, usually at a person's home or a local coffee shop.	▸ **Relaxed setting is conducive to effective dialogue.** ▸ **Provides for maximum two-way communication.**	▸ **Requires a lot of labour to reach many people.**	"These are effective as they allow people to be in the comfort of their own environment and to not feel threatened, or constrained in expressing their views. I have used these and if resources allow, and the neighbours are open to this, then I would include these as a recommended technique."
Local community meetings	Small meetings with existing groups or stakeholders with similar interests.	▸ **Provides opportunity for an in-depth information exchange in a non-threatening forum.** ▸ **Develops and fosters closer relationships.** ▸ **Able to tap into existing resources and contacts.**	▸ **May be too selective.** ▸ **Requires a skilled chairperson to maximise contributions of all members.**	

Table 6. (continued)

GROUP TECHNIQUES

Techniques	Description	Advantages	Limitations	Engagement consultant's thoughts based on experience
Social media	Social media platforms such as Twitter, Facebook, YouTube, Instagram are more interactive than conventional media and are increasingly being used to effectively consult and involve as well as inform stakeholders. When using social media, it is important to understand each platform's specific media needs. For example, Instagram is all about great photography.	▸ Used by a large number and diverse mix of people including young people who can be difficult to reach through other forums. ▸ Can tap into existing online communities and act as a platform to share content, opinions and ideas. ▸ Can involve people who may normally be apprehensive about committing to a group or expressing viewpoints in person. ▸ Can involve people who are time poor or who travel frequently.	▸ Most content on social media is the property of the proprietary organisation (e.g. Facebook). ▸ Must be kept up-to-date constantly or it may appear abandoned, unprofessional and unimportant. ▸ Can involve high staffing costs depending on level of moderation, sign-off procedures for posts, and desired response time.	

Table 6. (continued)

GROUP TECHNIQUES

Techniques	Description	Advantages	Limitations	Engagement consultant's thoughts based on experience
Online stakeholder engagement software/ platforms	Online stakeholder engagement software/platforms come in many guises with a range of different options for engaging stakeholders (e.g. Bang the Table, Social Pinpoint, SurveyMonkey, Consultation Manager). Whilst some software is focused on providing one tool (e.g. SurveyMonkey) other software is designed to bring together a variety of stakeholder engagement techniques using a specific cloud-based platform (e.g. Bang the Table, Social Pinpoint, SurveyMonkey, Consultation Manager) creating a coordinated online 'engagement hub for the project'.	▸ Accessible 24×7, at any place as long as you have an internet connection. ▸ Reserved people who usually don't speak up can say as much as they like while "loud" people are just another voice and can't interrupt. ▸ Unlike verbal conversation, online discussion is lasting and can be revisited. ▸ Participants don't have to contribute until they've thought about the issue and feel ready.	▸ Often without facial expressions and gestures or the ability to retract immediately, there's a big risk of misunderstanding. ▸ A large volume of messages can be overwhelming and hard to follow, and may even be stress-inducing.	

Table 6. (continued)

INDIVIDUAL TECHNIQUES

Techniques	Description	Advantages	Limitations	Engagement consultant's thoughts based on experience
Individual discussion	Selected individuals consulted by telephone, meetings, and door knocking an area. Home visits should be preceded by a safety/risk analysis.	▸ Provides a quick and efficient means of disseminating information and identifying a range of issues and views. ▸ Provides an opportunity for the engagement practitioner/ consultant to learn how best to communicate with a particular stakeholder group. ▸ Appropriate when confidentiality is essential.	▸ Provides limited opportunities for large numbers of stakeholders to participate in the process. ▸ Does not allow for broad-scale exchange of ideas. ▸ Multiple individual discussions can be very time consuming.	"This is one of the most effective techniques to use when the stakes are high for individuals impacted by projects or decisions. I recommend this technique often, but it is constrained mostly by lack of resources, particularly if there are a lot of impacted individual parties."
Survey	Structured questioning of a stakeholder sample that statistically represents the whole population or sector, used to gather information about objective characteristics or attitudes.	▸ Provides data for: → analysis of the characteristics of a particular community → documenting probable effects of a proposal → gauging likely public reaction to a proposal. ▸ Provides opportunity for input from individuals who would otherwise be unlikely to participate. ▸ Statistically valid results can satisfy a political need and are generally more persuasive.	▸ Minimal discussion and no interaction between participants. ▸ Respondents may be indifferent to the subject matter and require persuasion. ▸ Can be labour-intensive and expensive to generate statistically valid results. ▸ May be perceived as a public relations/marketing tool. ▸ For mailed surveys, the response rate is generally very low.	"This is one of the most popularly used processes to gather feedback from the stakeholders. Critical to providing a process for feedback"

Table 6. (continued)

INDIVIDUAL TECHNIQUES

Techniques	Description	Advantages	Limitations	Engagement consultant's thoughts based on experience
Interview	Selected individuals consulted by telephone, meetings, and door knocking an area. Home visits should be preceded by a safety/risk analysis.	▸ **Relatively low cost per interview.** ▸ **Opportunity to exchange basic information.** ▸ **Limited capacity to discuss issues.**	▸ **Would not be accessible for people from non-English speaking backgrounds unless interviewees are provided with interviews in other languages, or a translation service is provided.**	
Community walk-in information session/ pop-up kiosks/ shopfront displays/ displays and exhibitions	Means of disseminating information to stakeholders, mobile or permanent exhibition, may be staffed if seeking response and/or giving detailed explanation.	▸ **Opportunity to inform and meet with members of the wider community who can speak directly to the engagement practitioner/consultant.** ▸ **Opportunity to demonstrate commitment to engagement.**	▸ **May be costly and ineffective, particularly if the stakeholders do not perceive the issues as being of high importance.**	"This is mostly driven by statutory requirements. It is also effective to use this to support small meetings or community briefings. Another reference to this that we use are 'Pop-Up kiosk', or 'Shopfront displays" which can be very effective for allowing stakeholders to voluntarily pop by at their convenience within a specified time frame. An effective and popular process that should be used in conjunction with other methods. Note that it is also possible to have static displays over a longer period."

Table 6. (continued)

INDIVIDUAL TECHNIQUES

Techniques	Description	Advantages	Limitations	Engagement consultant's thoughts based on experience
Printed information/ information bulletin/ letters/ letterbox drops	Information bulletins, fact sheets, newsletters and brochures distributed regularly to households and/or made available to stakeholders at key public outlets.	▸ **Provides ongoing information on the project.** ▸ **Can reach large audience.** ▸ **Facilitates written responses if comment form is enclosed.** ▸ **Able to target a specific area.** ▸ **Can be sent out unaddressed to broad audiences (letterbox drops) or targeted using mailing list or distribution network to interested parties (letters).**	▸ **Difficult to communicate information about complex concepts in brief newsletters.** ▸ **If English is the only language used the level of literacy and English-language proficiency of recipients may limit effectiveness.** ▸ **Unaddressed flyers may be perceived as junk mail and may be ignored.**	"A no brainer. You need accurate, current information to support any type of active engagement. Should not be used in isolation in complex projects."
Hotline/1800 community line/1800 contact number	A telephone service to provide information and to record comments, concerns and suggestions.	▸ **Information is easily and directly accessible.** ▸ **Information flow is controlled and consistent.** ▸ **Easy to ensure up-to-date information is provided.** ▸ **Provides access to information for stakeholders with mobility concerns.**	▸ **Would not be accessible for people from non-English speaking backgrounds unless the hotline/1800 number is available in different languages, or a translation service is provided.** ▸ **The designated contact person must be committed to and prepared to provide prompt and accurate responses.**	"In NSW, we usually refer to a hotline as an 1800 contact number or 1800 community line. Vital to have a streamlined process to capture community input/feedback/complaints – but it's not always a complaint so the term hotline may deter some enquiries."

Table 6. (continued)

INDIVIDUAL TECHNIQUES

Techniques	Description	Advantages	Limitations	Engagement consultant's thoughts based on experience
Project website/ project email	Information dissemination through an interactive web page, aimed at informing and generating interest among stakeholders.	▸ Capable of reaching large audiences. ▸ Keeps stakeholders informed. ▸ Sites can be updated quickly and easily. ▸ Allows people to access large amounts of information and provide feedback.	▸ Only available to people who have access to a computer with web connection. ▸ Tends not to be accessible to minority groups such as the elderly, and people with non-English speaking backgrounds. This can be partly addressed using different languages and social media sites that target people from different language backgrounds. ▸ Can contribute to information overload if not managed effectively.	"Every project should have a website and project email."
Submission	Oral or written submissions to enable people to register their ideas and concerns, including through a complaint register, open to all stakeholders.	▸ Demonstration of organisational commitment to open engagement. ▸ Provides a focus which can enable groups to organise lobbying activities. ▸ Provides the engagement practitioner/consultant with information on the viewpoints of key stakeholders.	▸ Limited role as submissions are unlikely to draw response from minority groups in the community. Only 'organised' and articulate stakeholders are likely to respond. ▸ If oral submissions are organised, the formality of hearings may intimidate some people.	"A common council and government process encouraged to garner people's feedback. Usually associated with statutory planning processes"

Table 6. (continued)

INDIVIDUAL TECHNIQUES

Techniques	Description	Advantages	Limitations	Engagement consultant's thoughts based on experience
Media/ advertorials	Information through printed and electronic media, aimed at informing or generating interest and feedback. Most common use of media includes the provision of a regular column update (Advertorials) on a regular basis to help build up stronger community awareness and appreciation of a complex matter.	▸ **Demonstration of organisational commitment to provision of information.** ▸ **Keeps stakeholders informed.** ▸ **Provides opportunity for all stakeholders to participate in the engagement process.** ▸ **May satisfy any legal notification requirements.**	▸ **Will not reach all groups unless special attention is given to minority groups by the use of ethnic media and other avenues to reach other target groups.** ▸ **If paying for advertisements, can be expensive, especially in urban areas.** ▸ **Likely that only a limited amount of information will be conveyed.**	"Media is mostly ineffective. However, providing a regular column update (Advertorials) on a regular basis can often help to build up stronger community awareness and appreciation of a complex matter. This can be very effective over a longer period."

CHECKLIST E2 Does the plan consider how the engagement techniques will be delivered?

When determining how the plan will deliver engagement techniques, an aim should be to remove as many barriers to engagement as possible. This might involve anything from structuring engagement techniques to fit around stakeholders' existing schedules, through to a willingness to adjust engagement techniques in ways that respect stakeholders' cultural and accessibility needs. It is unlikely that the stakeholders will all raise the same issues, concerns, questions and information across the engagement techniques that are used to deliver the engagement plan. The plan needs to detail how these issues, concerns, questions and information will be recorded and addressed during stakeholder engagement.

CHECKLIST E2

Engagement considerations	Code	Existing guidance and evidence to support the plan's development	Questions to consider as you develop your plan
Location and Accessibility	**E2.1**	**Location and accessibility:** When delivering engagement techniques, consideration should be given to their accessibility to stakeholders. Consider using engagement techniques that allow stakeholders to engage on their own 'turf'; for example, from home (e.g. discussions and interviews at stakeholder's residence, websites, project email, 1800 community line, advertorials, social media, pop-up kiosks) or by connecting engagement techniques into existing community meetings. When it is not possible to engage with stakeholders on their own 'turf' select venues to suit the accessibility needs of the stakeholders. Issues to consider include: ▸ distance stakeholders need to travel to reach the venue ▸ stakeholders' ability to access the venue by public transport ▸ venues' accessibility for stakeholder's living with a disability (discussed further below). For example, people in rural areas are often required to travel long distances to venues in urban centres, and have limited access to public transport[484]	**Q** When delivering engagement techniques, have you considered engagement activities that enable stakeholders to engage on their own 'turf'? ■ Where it is not possible to meet stakeholders on their own 'turf', have you selected/created venues to suit the accessibility needs of the stakeholders (e.g. distance, access by public transport and access for people living with a disability)?
Engaging stakeholders on their own 'turf'	**E2.2**	**Engaging stakeholders on their own 'turf':** When delivering engagement techniques on the stakeholder's 'turf', have you tailored engagement techniques to their customs and processes? For example, if you are integrating the engagement process into a regular community group's meeting or a council meeting, are you aware of how they run their meetings? Some are very formal and some informal – find out in advance.[485] Provide a generous timeframe for engagement and be clear about what they need from you in advance.[486]	**Q** When delivering engagement techniques on the stakeholder's 'turf', have you tailored engagement techniques to their customs and processes?
Health and safety	**E2.3**	**Health and safety:** When delivering engagement techniques (e.g. on-site meetings, discussions and interviews at stakeholders' residences) that may involve a health or safety risk, be aware of your duties under work health and safety legislation and manage the risk appropriately.[487]	**Q** When delivering engagement techniques involving a health or safety risk, make sure you fulfil your duties under work health and safety legislation and manage the risk appropriately.

CHECKLIST E2 (continued)

Engagement considerations	Code	Existing guidance and evidence to support the plan's development	Questions to consider as you develop your plan
Timing	**E2.4**	**Timing:** When developing a timeline for delivering engagement techniques, keep in mind: ▸ the need to allow enough time to promote engagement techniques, encourage participation, disseminate information and allow the stakeholders to make considered responses. [488] (For example, except where stipulated by legislation or when stakeholder engagement is urgent, it is recommended that at least 28 days be allowed for stakeholder oral or written submissions. ▸ the timing of engagement techniques to allow stakeholder feedback, contributions, and decisions to be incorporated into the sites planning and management processes ▸ the timing of engagement techniques to suit the schedules of stakeholders. This may mean conducting techniques after business hours, or outside of public or cultural/religious holidays, or sporting events (e.g. school holidays, public holidays, community events).[489] For example, when engaging with Aboriginal communities have you considered the timing of: Aboriginal community events, Native Title case hearing schedules, law business and more family-oriented business (e.g. bereavement). These activities may affect people's availability, at both a community and personal level. Timelines should therefore be set with this in mind.[490] ▸ adjusting to the cycles of different stakeholder groups, and the time it takes for groups and individuals to be involved in formal discussions, debate and awareness raising[491] ▸ specific requirements regarding the timing of engagement techniques for government at the local, state and federal level ▸ requirements, under work health and safety laws, to consult with workers and their health and safety representatives at each step in the risk management process.[492] It is important to prepare a well-defined schedule for engagement techniques, so that stakeholders are aware of what they can expect (in the short and longer term), and when. For example, when will project emails be available, how frequently will advertorials be provided, and so on.	**Q** When developing a timeline for delivering engagement techniques, have you considered the stakeholders' time constraints and the amount of time they need to effectively engage and provide considered responses? ■ Have you prepared a well-defined schedule for engagement techniques so that stakeholders are aware of what they can expect and when?

CHECKLIST E2 (continued)

Engagement considerations	Code	Existing guidance and evidence to support the plan's development	Questions to consider as you develop your plan
Spoken and written language	**E2.5**	**Spoken and written language:** When delivering engagement techniques, it is important to consider whether languages other than English may be required due to: ▸ the stakeholder's proficiency in English and other languages (written and verbal) ▸ the effect that the sole use of English can have on the level of worry and perception of risk amongst those residents and other stakeholders who speak English as a second language.[493] Research suggests that the sole use of English to deliver engagement techniques increases the level of worry and risk perception amongst those residents who speak English as a second language. Those residents who speak English as a second language are more likely to be worried about contamination in their neighbourhood[494] and the application of remediation options, and to perceive greater risk to health from remediation options.[495] Consider the possibility of using interpreters to assist with the translation of written material or translation during focus groups or interviews, or consider including multilingual speakers on the engagement team when engaging with large groups of residents and other stakeholders from non-English speaking backgrounds.[496]	**Q** Have you considered how you will engage with stakeholders from non-English speaking backgrounds during the delivery of engagement techniques? ■ Have you considered using interpreters to assist with the translation of written material or to interpret during live events? ■ When engaging with large groups of residents and other stakeholders from non-English speaking background have you considered including multilingual speakers on the engagement team? ■ Have you considered the effect that the sole use of English during engagement activities may have on the level of worry and risk amongst those stakeholders who speak English as a second language?

CHECKLIST E2 (continued)

Engagement considerations	Code	Existing guidance and evidence to support the plan's development	Questions to consider as you develop your plan
Technical and scientific language	**E2.6**	**Technical and scientific language:** When delivering engagement techniques, remember that stakeholders come from a range of different backgrounds and circumstances. Their knowledge and experience of environmental matters in general, and contaminated sites in particular, will also vary. The person delivering an engagement technique needs to be aware that they can, however unintentionally, introduce a barrier to engagement if they deliver environmental data and technical information without careful consideration of their audience.[497] When delivering engagement techniques, it may be necessary to simplify the language used to convey scientific or technical information. This can be a challenge for those who may be experts in the complexity of scientific language. The following communication tips may be useful when explaining data to a diverse range of residents and other stakeholders: ▸ Do not try to impress people with words they do not understand. If a word needs defining, define it, e.g., "potable water is water suitable for drinking". Then, if the concept is addressed again, avoid using the word 'potable' and instead refer to 'drinking water'. ▸ If you must use jargon, introduce the concept before the word, i.e., "Science has a term for this, and it is 'potable water'". ▸ Ask stakeholders to stop you immediately if you use jargon they don't understand. ▸ Be especially careful about words that have different technical meanings than their common meaning (e.g., 'significance', 'conservative' and 'bias'). ▸ Be aware of risk messages that are culturally sensitive. ▸ Keep messages consistent.[498]	**Q** Have you considered how you will simplify the language used to convey scientific or technical information when delivering engagement techniques?

CHECKLIST E2 (continued)

Engagement considerations	Code	Existing guidance and evidence to support the plan's development	Questions to consider as you develop your plan
People living with a disability	**E2.7**	**People living with a disability:** When delivering engagement techniques, it is important to consider stakeholders living with a disability (mobility, vision or hearing impairment).[499] People participating in the engagement technique may have more than one form of disability. For example, a person who is living with a vision impairment may also be living with an intellectual disability.[500] When delivering engagement techniques, be aware of the difficulties that might be faced by those stakeholders who are living with a disability. Consideration should be given to the following during the delivery of engagement techniques: ▸ During promotion of the engagement techniques, ask persons living with disabilities to indicate their requirements and make necessary arrangements. Keep them informed. ▸ Put the person first, not their disability. Use the term 'a person with a disability' rather than 'a disabled person'. Remember that you are engaging with the person, not with the disability they may have.[501] ▸ In choosing venues for engagement techniques, consider whether the site is accessible (public transport, ramps), whether the building is internally accessible (suitable door widths, accessible toilets) and whether it meets the requirements of the people you are engaging with (Braille and tactile signage, hearing augmentation system).[502] ▸ In general, all engagement activities should be inclusive so that people with disabilities can participate in the same ways as others in the community. However, some people with disabilities may have difficulties, for example with being heard or understood in a large public forum, and it may be necessary to organise smaller forums that better suit their needs.[503] ▸ Use organisations or community groups that support people with disabilities to help in the delivery engagement techniques.[504] ▸ Some people with disabilities have carers. It is important to address any communication to the person with the disability and not to their carer or friend.[505] It is also important to be mindful of the carer's needs when delivering engagement techniques.[506]	**Q** During the promotion of engagement techniques, have you asked for persons living with disabilities to indicate their requirements and made necessary arrangements for these people? ■ Have you kept them informed? ■ Have you put the person you are engaging with first, not their disability (e.g. in describing the 'person with a disability' rather than 'a disabled person')? ■ Is the venue where the engagement technique will be delivered accessible (public transport, ramps)? ■ Is the venue internally accessible (suitable door widths, accessible toilets) and does it meet the specific requirements of the people living with disabilities that you are engaging (Braille and tactile signage, hearing augmentation system)? **Q** Have you asked organisations or community groups that support people with disabilities to help deliver engagement techniques? ■ Have you addressed your communication to the person with the disability rather than to their carer or friend? ■ Have you taken into consideration the carer's needs when delivering engagement techniques?

CHECKLIST E2 (continued)

Engagement considerations	Code	Existing guidance and evidence to support the plan's development	Questions to consider as you develop your plan
People from CALD communities, including Aboriginal people	**E2.8**	**People from CALD communities, including Aboriginal people:** When delivering engagement techniques that involve people from CALD backgrounds, including Aboriginal people, it is important to tailor the techniques to their needs.[507] Ask them what their engagement requirements are and make necessary arrangements. Engage organisations or community groups that support people from CALD backgrounds to help with invitations for and delivery of engagement techniques. It is important to note that people from some CALD backgrounds are sensitive about discussing personal topics and making decisions on behalf of their communities[508] and that people from some CALD backgrounds may need men-only and/or women-only opportunities for engagement.[509]	**Q** When developing and delivering the engagement plan, have you considered which engagement techniques are appropriate for people from CALD backgrounds, including Indigenous peoples?
Auxiliary activities	**E2.9**	**Auxiliary Activities:** When delivering engagement techniques, in particular face-to-face techniques such as workshops and focus groups, have you considered what axillary activities may be needed to support stakeholder engagement. For example: ▸ If engagement techniques are delivered during mealtimes, make sure you provide food and refreshments.[510] In providing food and refreshments you will need to consider the dietary requirements of the stakeholders being engaged. ▸ Providing children with creative learning activities under their parents' supervision while the engagement activity is taking place, or providing professional child care services to enable parents to engage.[511] ▸ Ensure that a Welcome to/Acknowledgement of Country is performed by an Indigenous person (or a non-Indigenous person if an Indigenous person is not present), at the beginning of group engagement activities (e.g., workshop, focus group, community briefing). In some instances, an Indigenous group/person may choose to perform a Welcome to Country.	**Q** When developing and delivering the engagement techniques, have you made provision for auxiliary activities associated with face-to-face engagement techniques (e.g. food and refreshment, acknowledgement to country, child support)?

CHECKLIST E2 (continued)

Engagement considerations	Code	Existing guidance and evidence to support the plan's development	Questions to consider as you develop your plan
Identifying issues, concerns, questions and information	E2.10	**Identifying issues, concerns, questions and information:** Based on the information obtained through the questions in Steps 3 and 4, the user of this guide should be able to identify a range of issues, concerns, questions and information that is likely to be the focus of engagement. A site can have one issue (e.g. that a contaminated site is being remediated) or might have multiple issues (e.g. that there are several remediation options that may or may not be appropriate for a site). It is important to allow for the fact that issues, questions, concerns and information may be viewed in multiple ways by stakeholders, and that stakeholders will introduce their own information, questions, concerns and issues that need to be considered during the delivery of engagement techniques.	**Q** Building on the questions outlined in Steps 3 and 4, have you identified a range of issues, concerns, questions and information that is likely to from the focus of engagement techniques? ■ Have you allowed for the information requests, questions, concerns and issues that stakeholders are likely to raise during the delivery of the engagement techniques?
Addressing issues, concerns, questions and information	E2.11	**A clear and transparent record of how issues, concerns, questions and information requests were addressed:** When delivering the engagement plan it is important to develop clear and transparent records of issues, concerns, questions and requests for information raised during engagement techniques (e.g. focus groups, 1800 community lines, surveys), the stakeholders that raised them, and how the engagement team provided feedback – that is 'messages' – in response to these issues, concerns, questions and information. Be sure to keep good records of your engagement with stakeholders, as people may query the process and how issues were addressed.[512] In keeping these records, it is important to maintain the level of confidentiality and anonymity agreed to with stakeholders (e.g. whilst it might be agreed that workshop notes will be publicly available on a website, it might be agreed that access to community meeting minutes will only be available to a particular group). Systems used to keep records, depending on the scale of the engagement plan, may vary from a diary kept by a single person through to the use of stakeholder engagement software which can assist engagement teams with the successful management of relationships with many stakeholders over the lifetime of a large engagement project.	**Q** When delivering the engagement techniques, have you considered how records will be kept of stakeholder issues raised through the engagement techniques and how these issues were responded to?

CHECKLIST E2 (continued)

Engagement considerations	Code	Existing guidance and evidence to support the plan's development	Questions to consider as you develop your plan
Managing issues, concerns, questions and information	**E2.12**	**Map stakeholder issues, concerns, questions and information requests:** When delivering an engagement plan, it can become difficult to keep a clear understanding of the issues, concerns, questions and information requests raised during engagement techniques (e.g. focus groups, 1800 community lines, surveys), the stakeholders that raised them, and it can be difficult to ensure that the engagement team provides consistent feedback – that is 'messages' – in response to these issues, concerns, questions and information requests. Message mapping can be used to promote clear and consistent responses to stakeholders when information is being delivered across different engagement techniques. Message maps help to: ▸ organise issues, questions, concerns and information in an easily understood and accessible framework ▸ allow the creation of clear, concise and consistent responses to issues, questions, concerns and information ▸ identify stakeholders who are interested in issues, questions, concerns and information, and their concerns about or perceptions of the issues, questions, concerns and information ▸ provide information that can be used as a basis for the creation of fact sheets, newsletters, education resources, presentations and media messages.[513] The creation of a message map is a step-by-step process that begins with the establishment of a message mapping team with expert knowledge on the subject, including a communications specialist.	**Q** Have you developed a message-mapping process to ensure that the engagement team provides consistent feedback – that is 'messages' – in response to these issues, concerns, questions and information requests raised across different engagement techniques?

CHECKLIST E2 (continued)

Engagement considerations	Code	Existing guidance and evidence to support the plan's development	Questions to consider as you develop your plan
Media/ advertorials and issues, concerns, questions and information	E2.13	**Media and advertorials:** Throughout the delivery of the engagement with stakeholders, media reports associated with the contaminated site should be monitored. Media reporting can have a significant impact on stakeholders. Media coverage can focus either on the negative or positive aspects of the issues, questions, concerns and information that are the focus of the engagement plan, and this focus can then determine whether stakeholders feel threatened and defensive or confident and cooperative. Advertorials can be one means of providing the wider local community with factual information about the contamination at the site and its investigation, remediation and ongoing management. Accordingly, it is important to ensure that the material available to the media is framed in a rational, consistent and non-inflammatory manner, and that it is consistent with other messages that are being provided to the stakeholders about specific issues, questions, concerns and information. It is sensible to nominate one person who has media training to liaise with the media and to act as the main point of contact. This helps to avoid conflicting or confused messages being disseminated about the engagement process.[514]	**Q** Have you identified the need to monitor media associated with the contaminated site as part of your engagement plan? ■ Are the messages you are providing to the media consistent with other messages being provided to other stakeholders? ■ Does the person who has been nominated to liaise with the media have media training?
Fulfil commitments	E2.14	**Honour commitments:** If you say you are going to do something, do it. Keep stakeholders in the loop with updates about the commitments you have made to them.[515] If you can no longer fulfil a commitment, make sure you inform stakeholders why you can no longer do so and suggest an alternative if relevant.[516]	**Q** When delivering the engagement techniques have you considered how you will follow through by honouring the commitments made to stakeholders?

CHECKLIST E2 (continued)

Engagement considerations	Code	Existing guidance and evidence to support the plan's development	Questions to consider as you develop your plan
Addressing risk, benefit, and uncertainty	**E2.15**	**Addressing perceived risk:** When delivering engagement techniques, it is important to acknowledge, understand and develop dialogue about the stakeholders' perceived risks alongside the findings from professional risk assessments. As a starting point, Steps 3 and 4 of this guideline have already provided some detailed insights into the diverse factors that influence residents; and other stakeholders' perceived levels of risk in relation, not only the contamination at the site, but also to the remediation approaches that can be used to address it. Many approaches to engaging with stakeholders about risk in the past have been mistakenly been directed towards getting the stakeholders to accept the risk estimates of experts. Technically-orientated risk professionals have attempted to 'fix' stakeholders' 'misperceptions' of risk rather than recognise that there are valid reasons for stakeholders' views. When residents and other stakeholders who are very frightened or angry about a contaminant or remediation approach are told that their risk perception is not important, or that they should 'calm down', the development of trust and mutual respect –crucial to effective engagement programs – is immediately undermined.[517] Whilst the phrase 'perceived risk' is commonly used and understood within the remediation industry, it may be understood differently and viewed negatively by some stakeholders. When engaging with stakeholders it might be appropriate to replace the word 'perceived' with the stakeholders' "understanding of" the risk.	**Q** Have you considered how you will acknowledge and engage with stakeholders' perceived risks alongside the findings from professional risk assessments when delivering engagement techniques? This question should be addressed for both the site's contamination, and the remediation approaches that will be used to address the site's contamination.

CHECKLIST E2 (continued)

Engagement considerations	Code	Existing guidance and evidence to support the plan's development	Questions to consider as you develop your plan
Addressing risk, benefit, and uncertainty	**E2.16**	**Conveying risk assessments:** When engaging with stakeholders about the findings of professional risk assessments it may be helpful to keep in mind that, in general, stakeholders will want more than just technical descriptions of the risks associated with the site's contamination, or of the risks associated with the remediation approach that will be used to address the contamination. The findings from the risk assessment should also be conveyed in ways that people with non-technical backgrounds can relate to, perhaps through analogies that are familiar and which can assist understanding.[518] Also, it may be helpful to keep in mind that, in general, stakeholders will want to know about: ▸ risk consequences – this includes effects and the level of danger associated with the risk ▸ level of control about the risk and its consequences – stakeholders want to know the answer to questions such as 'what should I do?' and 'what are others doing?' ▸ risk exposure – this includes risk intensity, duration, acceptable risk levels and how they are measured, how long the exposing agent is dangerous, how long it persists, and how it accumulates in the body.[519]	**Q** Have you considered how you will convey the findings from professional risk assessments when delivering engagement techniques? This question should be addressed for both the site's contamination, and for the remedial approaches that will be used to address the site's contamination.
	E2.17	**Addressing benefit:** When delivering engagement techniques, it is important to acknowledge, understand and develop dialogue on the stakeholders' perceived benefits of remediation options, alongside the findings from professional assessments of the benefits that will be brought about by remediation options that may be used at the site. In this context, residents' perceptions of benefit refer to their perceptions of the positive consequences of using a remediation option, which extend beyond just reducing or controlling the immediate unacceptable risks of an environmental contaminant to broader benefits such as land use opportunities that will benefit both current and future generations.[520] As a starting point, Step 4 of this guideline has already provided some detailed insights into the diverse factors that influence residents' and other stakeholders' perceived levels of benefit for remediation options. Stakeholder engagement for contaminated sites has traditionally focused on the risks of harm to humans and the environment from exposure to the contamination. In recent years there has been an increased focus on the types of benefits that the site's remediation approach(es) can bring.[521]	**Q** Have you considered how you will acknowledge and engage with stakeholders' perceived benefits of remedial options, alongside the findings from professional assessments of the benefits of remedial options when delivering engagement techniques?

CHECKLIST E2 (continued)

Engagement considerations	Code	Existing guidance and evidence to support the plan's development	Questions to consider as you develop your plan
Addressing risk, benefit, and uncertainty	**E2.18**	**Addressing uncertainty:** When delivering engagement techniques, it is important to acknowledge and discuss uncertainties with stakeholders as soon as they arise. Don't wait until you are confronted with them. Uncertainties regarding contaminated sites may relate to the contamination and/or remediation and ongoing management options being used at the site. Clearly articulate any uncertainties: ▸ Explain where the greatest uncertainties lie. ▸ Review expert judgement and the assumptions recorded. ▸ Look for comparable situations elsewhere within Australia if possible. ▸ If clear scientific and technical information does not exist, say so. Explain what has been done so far to reduce or eliminate the uncertainty, and any way that stakeholders can assist. Clearly explain when you will know more.	**Q** Have you considered how you will acknowledge and engage with stakeholders about uncertainties during the delivery of engagement techniques? ■ This question should be addressed for both the site's contamination, and for the remediation approaches that will be used to address the site's contamination.

CHECKLIST E2 (continued)

Engagement considerations	Code	Existing guidance and evidence to support the plan's development	Questions to consider as you develop your plan
Trust, credibility and confidence	**E2.19**	**Trust, credibility and confidence:** Trust, credibility and confidence are closely related and interdependent. Credibility (being worthy of confidence) is usually necessary to establish trust, but credibility alone does not guarantee trust.[522] Within the contaminated site context, stakeholders will rely on their level of trust and confidence in organisations responsible for the regulation, remediation and management of the sites. As discussed in Steps 3 and 4 the level of trust and confidence that a stakeholder has in these organisations can significantly impact the way in which stakeholders are: ▸ concerned about and experience the contamination's risk ▸ concerned about and perceive the risks and benefits of the approach that is used to remediate and/or manage the contamination at the site. The stakeholders experience with these organisations during the engagement process can impact on the level of trust and confidence that stakeholders have in these organisations. Within the engagement process an organisation's openness, honesty and transparency are necessary to demonstrate credibility and earn trust. This includes a frank and honest approach to dealing with uncertainty, which is inevitable in any risk assessment. Denial of uncertainty (both knowledge uncertainty and uncertainty caused by variability) will eventually backfire and undermine credibility.[523] Wherever possible, subject to privacy legislation, organisations should be encouraged to adopt an 'open door' approach when engaging with stakeholders.[524]	**Q** When delivering engagement techniques have you considered how you seek to ensure that organisations involved are as open, honest and transparent with stakeholder as possible, to help to demonstrate to stakeholders that they are credible and can be trusted?
Resolving disputes	**E2.20**	**Resolving disputes:** Because stakeholders' objectives for dealing with contaminated land may not coincide with the objectives of other stakeholders, there is always potential for disputes to arise that are unlikely to be resolved purely by an engagement plan. Because litigation is expensive and often ineffective, dedicated alternative dispute resolution methods, such as negotiation or meditation, should be pursued before disputes become unmanageable.[525]	**Q** Does the plan acknowledge that not all disputes can be resolved through the engagement techniques employed, and that dispute resolution methods, such as negotiation or meditation, may need to be pursued before disputes become unmanageable?

CHECKLIST E3

Does the plan consider the need for reporting, updating and ongoing evaluation?

Related to : CASESTUDY 6

Reporting, updating and ongoing evaluation are crucial parts of the engagement plan. It is important to determine upfront how and when to: 1) report back on the engagement plan to both stakeholders and the consent authority – who may have identified engagement as a condition of their consent, and 2) evaluate the engagement plan's objectives, processes and outcomes. It is also important to acknowledge that the engagement planning will evolve over time and will need to be updated.

Reporting and evaluation considerations	Code	Guiding evidence and accepted practice	Questions to consider as you develop your plan
Reporting back to stakeholders	**E3.1**	**Reporting back to stakeholders:** Reporting back to residents and other stakeholders regarding their engagement is a vital aspect of engagement planning. Reporting should be provided at each stage of the engagement process for each engagement technique, as well as at the completion of the plan. Timely reporting back both validates information as it is gathered, and encourages continued involvement. It provides evidence that stakeholders' views, comments and suggestions have been recorded accurately and taken seriously, contributing to the level of trust between all participants in the engagement program. It also enables people to hear other people's views. When reporting back to stakeholders, reporting back should include details about: ▸ the rationale for, and extent of, the engagement activities undertaken ▸ the potential stakeholders who were identified and invited to participate, the names of stakeholders who participated (subject to compliance with privacy legislation) ▸ how, when and where engagement activities were carried out, including methods and techniques that were used ▸ the information that was provided to stakeholders ▸ input provided by stakeholders ▸ what decision was made ▸ how the stakeholders' input was considered and incorporated into the decision-making process ▸ what other factors influenced the decision that was made (e.g. legislation or policy) ▸ the availability of documentation for viewing by stakeholders[526]	**Q** When delivering the engagement plan have you considered how you will provide feedback to residents and other stakeholders regarding their involvement in different engagement techniques?

CHECKLIST E3 (continued)

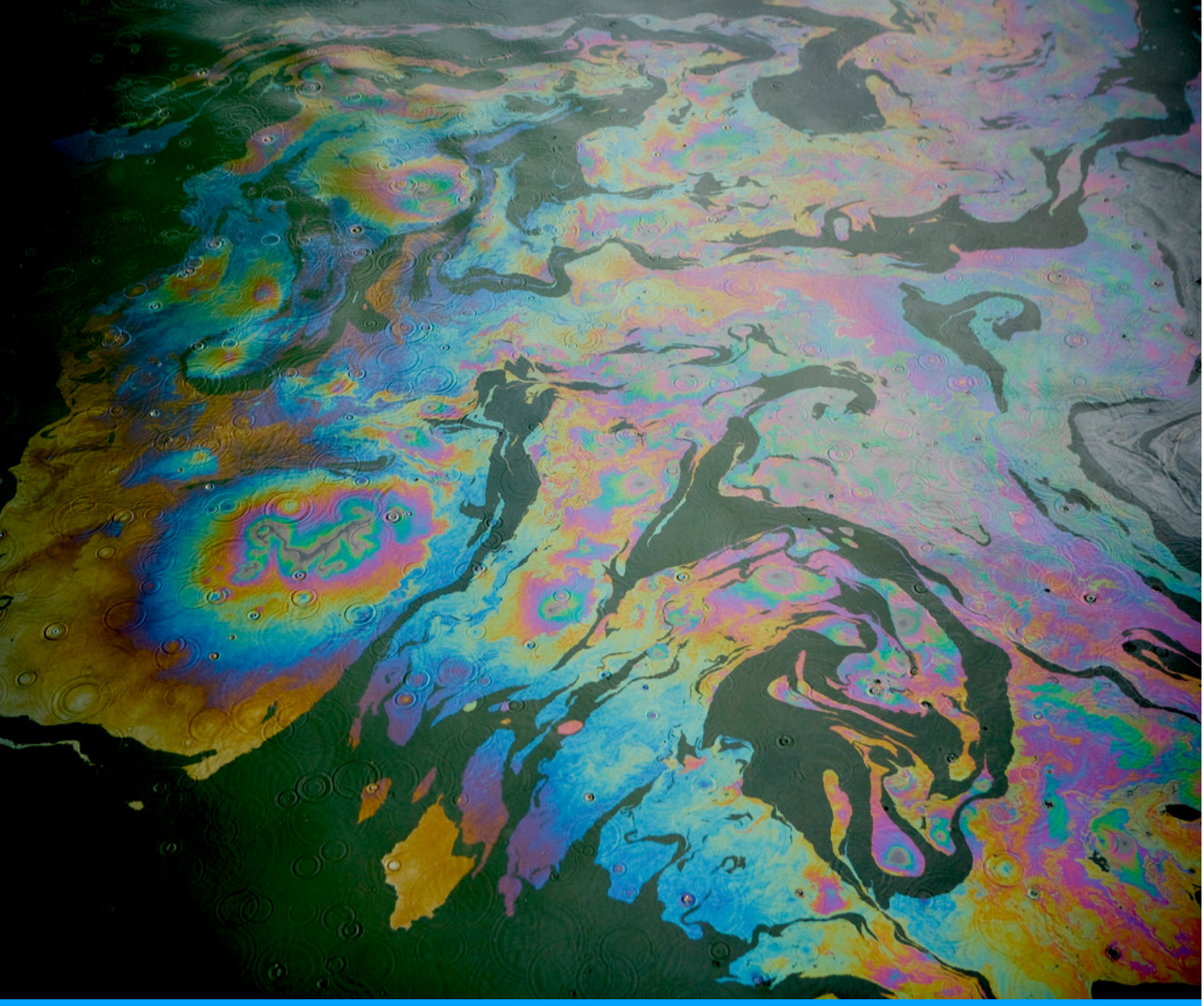
Reporting and evaluation considerations	Code	Guiding evidence and accepted practice	Questions to consider as you develop your plan
Reporting back to consent authorities	**E3.2**	**Reporting back to consent authorities:** Consent authorities may put in place reporting requirements relating to the stakeholder engagement program. It is important to consult the relevant government authority regarding reporting requirements. The required report is likely to address the following topics (where relevant and appropriate): ▸ the names of potential stakeholders (individuals and groups) who were identified and invited to participate, subject to compliance with privacy legislation (may be included as an appendix) ▸ how potential stakeholders were invited to participate (e.g. notices, advertisements) ▸ the names of stakeholders who participated and had their names recorded, subject to compliance with privacy legislation (may be included as an appendix) ▸ how, when and where engagement activities took place (with further information such as the minutes of meetings included in an appendix) ▸ a summary of information provided to stakeholders (with further details provided in an appendix) ▸ input and comment received from stakeholders ▸ how stakeholders' input was considered and incorporated in the decision-making process.[527]	**Q** When you have delivered the engagement plan have you considered how you will provide feedback to the consent authority about the fulfilment of any engagement requirements?

CHECKLIST E3 (continued)

Reporting and evaluation considerations	Code	Guiding evidence and accepted practice	Questions to consider as you develop your plan
Updating the engagement plan	**E3.3**	**Updating the engagement plan:** Engagement plans evolve over time; accordingly, they will need to be updated as new information comes to light.[528] When changes are made to the engagement plan it is important to: ▸ inform existing stakeholders about the new information as soon as possible ▸ seek their guidance and support for the changes proposed to the engagement plan in response to the new information. New and different stakeholders may need to be included because of the new information (e.g. changes in management areas because of new information about the contamination). The identification and inclusion of stakeholders in the engagement plan is an ongoing process.[529]	**Q** When updating the engagement plan to respond to new information that may come to light, have you: ▸ informed existing stakeholders about the new information? ▸ sought their guidance and support for proposed changes to the engagement plan in response to the new information? **Q** Have you assessed whether the new information changes changes the composition of the stakeholder population?
Evaluating the engagement plan	**E3.4**	**Define the evaluation plan's objectives with interested parties:** Evaluation of engagement processes and outcomes is a crucial part of engagement planning. Identify the parties with an interest in the evaluation (i.e. who wants to know what and why?). There may be many people who will use the findings of your evaluation to make decisions (e.g. authorities may use them when signing off on conditions of consent for remediation). These parties' interests will define the objectives(s) for conducting the evaluation. Understanding the objectives(s) of an evaluation helps clarify how it should be conducted and how the results should be used. A well-designed evaluation process can have a range of objectives; for example: ▸ to demonstrate how well the engagement plan's objectives have been met ▸ to improve how stakeholder engagement is done ▸ to give stakeholders a broad picture of how others view the engagement process by sharing the outcome of your evaluations with them ▸ to gain insight into what constitutes effective resident engagement in different situations.[530]	**Q** Have you designed an evaluation process as part of your engagement plan? **Q** Does the engagement plan identify the parties that have an interest in the evaluation (e.g. stakeholders, consent authority)? Have these parties been involved in identifying the purpose(s) of conducting the evaluation?

CHECKLIST E3 (continued)

Reporting and evaluation considerations	Code	Guiding evidence and accepted practice	Questions to consider as you develop your plan
Evaluating the engagement plan	**E3.5**	**Involve all stakeholders in evaluation:** Plan to involve all stakeholders in evaluation during the implementation of the engagement plan, as well as after the conclusion of the engagement plan. This will allow for mid-course improvements to be made, where necessary.[531] Opportunities for collecting evidence to inform the plan's evaluation should be collected: ▸ at the end of each engagement activity through stakeholder feedback (e.g. feedback forms provided to participants at the end of worships, feedback questions at the end of a survey, or a feedback question at the end of a telephone interview) ▸ through activities (e.g. focus groups) that provide stakeholders with the opportunity to provide feedback on broader aspects of the engagement plan.[532]	**Q** Does the evaluation process identify how and when evidence will be collected from stakeholders to inform the engagement plan's ongoing evaluation?
	E3.6	Resources needed to undertake evaluation: Consider the resources required to undertake the engagement plan's evaluation process. When deciding who will be responsible for collecting evidence and when they will undertake these tasks, you should also consider what, if any, evaluation tasks would be better allocated to evaluation consultants.[533]	**Q** Have you identified and secured the resources needed to carry out the engagement plan's ongoing evaluation?



CASESTUDY 6

How involving residents in the evaluation of engagement strategies can help to improve future resident engagement activities and programs: Groundwater contamination at Botany Bay

CONTEXT

Timeframe	1990–2011
Site	Botany Industrial Park
Contaminant(s)	Groundwater chemical contamination, HCBs, heavy metal and waste
Selected remediation option	Mix of air stripping and recuperative thermal oxidation for the groundwater contamination onsite and offsite
Issue	Institutional context and support for remediation options
Related checklist	**Checklist E3** Does the plan consider the need for reporting, updating and ongoing evaluation.

LESSONS LEARNED

- **Existing relationships and levels of trust present between communities and industry can affect resident support for remediation options.**
- **Involving stakeholders in ongoing evaluation processes can help to improve future resident engagement activities and programs, which can also help to improve trust between residents, government agencies and industry.**
- **Good practice involves learning lessons from evaluations of engagement methods and devising new engagement methods over time.**

Situation

Contaminants were first detected at the site of the Botany Industrial Park in the 1990s. The range of contaminants found included heavy metal contaminants in soils (including mercury), stockpiles of hexachlorobenzene waste materials (HCBs), and a large groundwater plume contaminated with chemicals such as dichlorophene. The contamination resulted from many decades of poor environmental management and industrial waste disposal from the 19th century right through to the 1980s when the site was home to a large chemical manufacturing plant[534]. In 2003, the NSW EPA issued a clean-up notice to Orica, who were the current occupants of the site. Orica responded positively to the request and agreed to provide quarterly reports on its remediation plan. The remediation method chosen was air stripping plus recuperative thermal oxidation. Construction works for the groundwater treatment plant were approved in February 2005 and would require over 30 years of work in order to fully decontaminate the groundwater.[535] Remediation for off-site contamination involved asking residents if they wanted their properties tested and offering to remediate the area to the satisfaction of the owner and the EPA[536].

Actions Taken

To establish a means for ongoing communication with the community at Botany, a government-mediated community participation and review committee (CPRC) was established by Orica in 1997. A community liaison committee (CLC) was

also set up in 1996 to address issues surrounding groundwater treatment. These committees were combined in 2014 into the Orica Botany Liaison Committee (OBLC). During the 1990s and early 2000s, communication between Orica and the community relied heavily on a CPRC as the major form of community consultation or participation.[537] The aim of the CPRC and CLC was to represent the interests of the community and its members.[538] However, the CPRC received a degree of criticism as a method used for ongoing engagement on the basis that its set-up resulted in the CPRC becoming more of a passive receiver of information and decisions already made by Orica than an active player in decision-making processes. It was also argued that the CPRC provided community members with only a limited ability to ask questions.[539] In addition, because only a very small number of community members took on roles as community representatives within in the CPRC, it was argued that the CPRC did not do enough to encourage community members to participate in decision-making processes.[540] Concerns were also raised that industry experts with stakes in the use of remediation options were being called upon to provide advice, which community members believed (whether this was an accurate assessment or not) to be likely to be biased in favour of particular remediation options.[541]

Orica responded to the concerns about its approach to engagement described in Carson (2009) by adopting a broader range of methods to raise public awareness and engagement with contamination and the issue of remediation.[542] Specific engagement techniques included media releases, door-to-door leaflet drops, writing columns for local newspapers and holding public meetings. However, these approaches were also criticised by researchers on the basis that these other forms of engagement did not allow options to be explored, for clarification to be sought, or for dialogue or mutual learning processes to take place. In addition, it was argued that not enough effort was made to obtain feedback or to check that issues had been fully understood.[543]

Acknowledging the potential for a more participatory approach for engaging residents and for enhancing trust in official institutions, Orica developed a number of new approaches to engagement that were more inclusive and collaborative.[544, 545] These approaches were well received. Scientific experts were invited to attend CPRC and CLC meetings to provide information about remediation options. Orica also undertook several community outreach programs in response to community concerns about the quality of bore water.[546] Between 2003 and 2011, Orica offered to sample the bore water for residents living in the exclusion zone for the presence of contaminants associated with Orica's historical operations. Consequently, between 2005 and 2008, 993 rainwater tanks were provided to residents and schools to restore lost amenity because of groundwater contamination. This was expanded out from the exclusion zone area to the wider contaminated area boundary. During this three-year period, Orica also ran an air quality awareness program in consultation with local

schools, and the company continues to run site tours for community members and other interested groups to enable them to ask questions and visit the site.[547] Orica also increased its efforts to communicate information about remediation plans to people from diverse cultural and linguistic backgrounds, and to provide opportunities for feedback, including the provision of the contact details of the organisations that could be contacted for further advice.

Outcomes

This move towards more inclusive and greater participatory approaches to engagement helped to enhance resident confidence in remediation options and in the official organisations involved in the remediation processes. In particular, the improved visibility of the organisations' values helped to enhance resident trust in the organisations. The provision of more opportunities for discussion, feedback and co-learning enhanced confidence that the community was being included on a more equal basis.

Conclusions and recommendations

Existing research has demonstrated the importance of pre-existing levels of trust between residents and scientific, industry and government bodies for influencing resident support for remediation options.[548] The extent to which residents believe that government should regulate technology, their willingness to rely on advice or defer to experts about a remediation option, and the language used in official communications about ongoing remediation all influence levels of acceptance of remediation options.[549, 550] Those who were more sceptical of industrial organisations were more likely to have a preference for remediation processes to be regulated by the government.[551] Trust in experts is also known to be more likely to be enhanced if organisations ensure the views of different groups of residents are fully understood, debated and considered. A proactive approach to communication about the selection of remediation options is known to be more likely to help generate trust in organisations.[552] Communication also needs to be regular and varied to reach people moving into the community and people who may have very different lifestyles to one another.[553]

The outcomes from the Botany Industrial Park case study show the importance of learning lessons from evaluations of previous engagement methods in order to improve future engagement activities. By learning from experience, Orica was

able to improve their engagement with local residents in ways that helped to improve trust between members of the community and industry during an ongoing process of remediation. Evaluations of current approaches should occur regularly in order for new communications approaches to be developed to address any emergent issues at the earliest possible opportunity.

GLOSSARY

Amenity generally refers to the qualities, characteristics and attributes people value about a place which contributes to their experience of a high quality of life.

Bioremediation generally refers to the use of biological technologies in the form of microbes, fungi and enzymes to clean up contaminated land and groundwater.

Chemical remediation generally involves the use of chemical reagents to oxidise or reduce contaminants, particularly in groundwater, although the method can extend to soils. There are several chemical oxidants that can be used to treat chlorinated solvents, and some mobile heavy metals.

Chemical treatment general (in situ) involves the injection of chemical oxidants or reductants into groundwater or soil, which subsequently leads to the destruction of contaminants of concern or their transformation into something safer.

Community – see definition of **Stakeholder** in this glossary.

Contamination means the condition of land or water where any chemical substance or waste has been added as a direct or indirect result of human activity at above background level and represents, or potentially represents, an adverse health or environmental impact.[554]

Contaminated land means any land in, on or under which any substance is present at a concentration above the concentration at which the substance is normally present in, on or under (respectively) land in the same locality, where that presence involves a risk of harm to human health or any other aspect of the environment. [555] When referring to contaminated land in the NSW context, land includes water on or below the surface of land and the bed of such water [556], where 'waters' means the whole or any part of: (a) any river, stream, lake, lagoon, swamp, wetlands, unconfined surface water, natural or artificial watercourse, dam or tidal waters (including the sea), or (b) any underground or artesian water.[557]

Contaminated site means the area impacted by contaminants. The parcel(s) of land where remediation activity is occurring.

Dig and dump (ex situ offsite) involves the excavation and removal of contaminated soil from a site and its transportation to a landfill site where it is stored and monitored.

Encapsulation (in situ) comprises the physical isolation and containment of the contaminated material. In this technique, the impacted soils are isolated by low-permeability caps, slurry walls, grout curtains or cut-off walls.

Environment means components of the earth, including: (a) land, air and water, and (b) any layer of the atmosphere, and (c) any organic or inorganic matter and any living organism, and (d) human-made or modified structures and areas, and includes interacting natural ecosystems.[558]

Ex situ offsite remediation involves remediation options where the affected medium (soil, water) is removed from its original location and either stored or cleaned off-site.

Ex-situ onsite remediation: Involves remediation options where the affected medium (soil, water) is removed from its original location and cleaned or stored on-site.

Harm means, in relation to the contamination of land, harm to human health or some other aspect of the environment (including any direct or indirect alteration of the environment that has the effect of degrading the environment), whether in, on or under the land or elsewhere. [559]

Immobilising/stabilisation (in situ, ex situ) generally refers to a process that reduces the risk posed by a waste or soil by converting the contaminant into a less soluble, immobile, and less toxic form.

Incineration (ex situ offsite) involves excavating and heating soils so that the contaminants are destroyed.

In situ remediation: Involves treatment of contaminants in place using technologies such as microbial bioremediation.

Microbial bioremediation (in situ) utilises microbial activity to remove or degrade contaminants in groundwater, waste or soil.

Mining (ex situ onsite, ex situ offsite) involves excavation, screening and separation and recycling of all old landfill material. Unusable or contaminant-producing materials are then stored.

Monitored natural attenuation (MNA): may be used after remediation has been carried out to the extent practicable through other technology types. It may be acceptable to allow the residual contamination to degrade naturally (i.e. monitored natural attenuation). This particularly applies in the case of residual groundwater contamination, where the residual matter poses a low risk.

Nanoremediation (in situ) involves introducing chemical substances containing microscopic particles called nanoparticles to destroy or degrade the contaminant in the soil or groundwater to an acceptable level.

Phytoremediation (in situ) uses plants to clean up contaminated soils and groundwater. This process takes advantage of the ability of plants to take up, accumulate, stabilise and/or degrade contaminants in soil and groundwater.

Proximity (distance to site) is considered in most remediation policies and guidelines.[560] The proximity of residential areas or sensitive receptors (childcare centres, hospitals, schools or nursing homes) to the contaminated site will have a bearing on the degree of engagement required.[561]

Permeable Reactive Barrier (in situ) involves introducing a chemical treatment wall into the groundwater flow - as contaminated groundwater passes through the treatment wall, the contaminants are either trapped by the treatment wall or transformed into harmless substances that flow out of the wall.

Physical remediation generally involves a range of physical techniques such as vacuum extraction (to remove contaminants in vapour form), soil washing, and separation. Excavation and removal of contaminated soil and disposal in a landfill is a common method of remediation.

Remediation means the clean-up or mitigation of pollution or of contamination of soil or water by various methods.[562]

Affected residents means those individuals and/or groups residing in a locality near a contaminated site who may be affected by contamination from the site or by the remediation process associated with the site.[563]

Resident – see definition of **Stakeholder** in this glossary

Remediation site means: (a) land declared to be a remediation site by a declaration in force under Division 3 of Part 3 of the Contaminated Land Management Act 1997, or (b) premises: (i) in respect of which there is in force a notice under section 35 of the Environmentally Hazardous Chemicals Act 1985 requiring prescribed remediation action to be taken, or (ii) that are the subject of prescribed remediation action (whether being undertaken by the Environment Protection Authority or by another public authority at the direction of that Authority).[564]

Responsible party: the party who is responsible for remediation at a contaminated site. Each state and territory legislates for the regulation of activity related to contaminated sites. In Australia the 'polluter pays principle' is generally adopted to determine liability and responsibility for the remediation and management of a contaminated site. If it is not possible or practicable to impose liability on the polluter, each jurisdiction has legislative powers to issue notices to appropriate persons.

Risk means the probability in a certain timeframe that an adverse outcome will occur to a person, group, or ecological system that is exposed to a particular dose or concentration of a hazardous agent. The level of risk depends on both the toxicity of the hazardous agent and the level of exposure.[565]

Risk communication means an interactive process involving the exchange among individuals, groups and institutions of information and expert opinion about the nature, severity and acceptability of risks and the decisions to be taken to combat them. Risk communication is delivered most efficiently in the context of a well-structured stakeholder engagement process.

Risk management is a coordinated set of activities and methods that are used to direct and to control risks.[566]

Risk perceptions are the subjective judgements that people make about the characteristics and severity of a risk.[567] Perception of risk can be influenced by numerous factors beyond just the 'scientific data'.[568]

Stakeholder is often used interchangeably with the term resident or community. For the purposes of this guideline, stakeholder means an individual, group, organisation or other entity that may be affected by, or interested in, the site contamination and its remediation and management. Depending on specific site circumstances, stakeholders may include residents, site owners, public health officials, government regulatory authorities, media outlets, businesses working onsite, and environmental or other action/interest groups, as well as site owners and people working on the project.[569]

Sustainability means an integrated assessment of the environmental, economic, and social impacts of remediation activities which meets the needs of the present without compromising the ability of future generations to meet their own needs.[570]

Sustainable remediation is a remediation solution selected through the use of a balanced decision-making process that demonstrates, in terms of environmental, economic and social indicators, that the benefit of undertaking remediation is greater than any adverse effects.[570]1

Thermal desorption (ex situ onsite) involves excavating and heating soils so that contaminants are vaporised and the vaporised contaminants are then collected and treated by other means.

Thermal vapour extraction (in situ) involves injecting heat into the soil or waste so that contaminants are vaporised and extracting the vapour that is formed by the heat.

Thermal remediation generally refers to the use of heat to de-contaminate an area. Thermal remediation can be done onsite (in situ) (e.g. steam injection, resistance heating and conductive heating); or by carrying out a treatment of excavated soil offsite (ex situ). In particular, thermal treatment is used to treat recalcitrant compounds such as persistent organic pollutants.

Worker means any person who carries out work for a person conducting a business or undertaking, including work as an employee, contractor, subcontractor, self-employed person, outworker, apprentice, trainee, work experience student, employee of a labour hire company placed with a 'host employer', or volunteer.

ENDNOTES

1. See for example: Australian and New Zealand Environment and Conservation Council and National Health and Medical Research Council, Australian and New Zealand Guidlines for the Assessment and Management of Contaminated Sites, Australian Capital Territory Environment Protection Authority, Contaminated Sites Environmental Protection Policy, Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement, ---, Identifying and Selecting Remediation Options, National Environment Protection Council, National Environment Protection (Assessment of Site Contamination) Measures 1999, Schedule B(8) - Guideline on Community Consultation and Risk Communication, New South Wales Department of Environment, UPSS Technical Notes: Decommissioning, Abandonment and Removal of UPSS, New South Wales Government, Managing Land Contamination: Planning Guidelines SEPP 55–Remediation of Land, Northern Territory Environment Protection Authority, Guidelines for Consultants Reporting on Environmental Issues, South Australia Environment Protection Authority, EPA Guidelines for Environmental management of on-site remediation, ---, Stakeholder engagement delivery framework (Site contamination), Sustainable Remediation Forum Australia et al., A Framework for Assessing the Sustainability of Soil and Groundwater Remediation, Government of Western Australia and Western Australia Department of Environment Regulation, Assessment and management of contaminated sites: Contaminated sites guidelines, ---, Identification, reporting and classification of contaminated sites in Western Australia: Contaminated Sites Guidelines, Government of Western Australia and Western Australia Department of Environment amd Conservation, A guideline for managing the impacts of dust and associated contaminants from land development sites, contaminated sites remediation and other related activities, Victorian Environment Protection Authority and WorkSafe Victoria, Industry standard: Contaminated construction sites.
2. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 8.1
3. Ibid., Section 8.1
4. Ibid., Section 7.3
5. Ibid., Section 8.1
6. Ibid., Section 7.3
7. Ibid., Section 7.3
8. Ibid., Section 7.3
9. See for example: National Environment Protection Council, National Environment Protection (Assessment of Site Contamination) Measures 1999, Schedule B(8) - Guideline on Community Consultation and Risk Communication, Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement.
10. See for example: New South Wales Department of Environment and Conservation, Contaminated Sites: Guidelines for the Assessment and Management of Groundwater Contamination, New South Wales Government, Managing Land Contamination: Planning Guidelines SEPP 55–Remediation of Land.
11. The evidence based includes detailed findings collected through engagement with 2009 residents living near 13 contaminated sites across Australia: Huynh et al., "Evaluating residents' preferences for remediation technologies: A choice experiment approach.", McIntyre et al., "Sociodemographic predictors of residents worry about contaminated sites,"---, Prior, "The norms, rules and motivational values driving sustainable remediation of contaminated environments: A study of implementation,"---, ---, "Factors influencing residents' acceptance (support) of remediation technologies.", Prior et al., "Using residents' worries about technology as a way of resolving environmental remediation dilemmas,"---, Prior and Partridge, Technical Report No.17: The Australian experience: A comparative analysis of the effects of contamination and its remediation on individuals and communities at two Australian sites, Prior et al., "'We get the most information from the sources we trust least': residents' perceptions of risk communication on industrial contamination.", Prior and Rai, "Engaging with residents' perceived risks and benefits about technologies as a way of resolving remediation dilemmas.", Prior et al., "A geography of residents' worry about the disruptive effects of contaminated sites.", Connon et al., "Danger from the Outside: Resident Perceptions of Environmental Contamination at Home."
12. See for example: National Environment Protection Council, National Environment Protection (Assessment of Site Contamination) Measures 1999, Schedule B(8) - Guideline on Community Consultation and Risk Communication, Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement.
13. See for example: New South Wales Department of Environment and Conservation, Contaminated Sites: Guidelines for the Assessment and Management of Groundwater Contamination, New South Wales Government, Managing Land Contamination: Planning Guidelines SEPP 55–Remediation of Land.

14. The evidence base includes detailed findings collected through engagement with 2009 residents living near 13 contaminated sites across Australia: Huynh et al., "Evaluating residents' preferences for remediation technologies: A choice experiment approach.", McIntyre et al., "Sociodemographic predictors of residents worry about contaminated sites.", Prior, "The norms, rules and motivational values driving sustainable remediation of contaminated environments: A study of implementation.", ---, "Factors influencing residents' acceptance (support) of remediation technologies.", Prior et al., "Using residents' worries about technology as a way of resolving environmental remediation dilemmas.", Prior and Partridge, Technical Report No.17: The Australian experience: A comparative analysis of the effects of contamination and its remediation on individuals and communities at two Australian sites, Prior et al., "'We get the most information from the sources we trust least': residents' perceptions of risk communication on industrial contamination.", Prior and Rai, "Engaging with residents' perceived risks and benefits about technologies as a way of resolving remediation dilemmas.", Prior et al., "A geography of residents' worry about the disruptive effects of contaminated sites.", Connon et al., "Danger from the Outside: Resident Perceptions of Environmental Contamination at Home."

15. See for example: Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement, ---, Identifying and Selecting Remediation Options, National Environment Protection Council, National Environment Protection (Assessment of Site Contamination) Measures 1999, Schedule B(8) - Guideline on Community Consultation and Risk Communication, ---, National Environment Protection (Assessment of Site Contamination) Measures 1999, Schedule 1-6, Schedules A and B, New South Wales Department of Environment and Conservation, Contaminated Sites: Guidelines for the Assessment and Management of Groundwater Contamination, New South Wales Government, Contaminated Land Management Act 1979 No. 140, New South Wales Environment Protection Authority, Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997, New South Wales Government, Managing Land Contamination: Planning Guidelines SEPP 55–Remediation of Land, ---, Contaminated Land Management Regulation 2013, Sustainable Remediation Forum Australia et al., A Framework for Assessing the Sustainability of Soil and Groundwater Remediation.

16. National Environment Protection Council, National Environment Protection (Assessment of Site Contamination) Measures 1999, Schedule B(8) - Guideline on Community Consultation and Risk Communication.

17. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement.

18. ---, Identifying and Selecting Remediation Options.

19. Where engagement with the public is considered by existing legislation, the primary focus of existing legislation is upon telling the stakeholders – either about land contamination and/or the remediation New South Wales Government, Contaminated Land Management Act 1979 No. 140.

20. Ibid.

21. New South Wales Government, Managing Land Contamination: Planning Guidelines SEPP 55–Remediation of Land.

22. ---, Contaminated Land Management Regulation 2013.

23. ---, Protection of the Environment Operations Act 1997 No 156.

24. ---, Environmental Planning and Assessment Act 1979 No 203.

25. EnHealth, Environmental Health Risk Assessment: Guidelines for assessing human health risks from environmental hazards.

26. Sustainable Remediation Forum Australia et al., A Framework for Assessing the Sustainability of Soil and Groundwater Remediation.

27. See for example: Huynh et al., "Evaluating residents' preferences for remediation technologies: A choice experiment approach.", McIntyre et al., "Sociodemographic predictors of residents worry about contaminated sites.", Prior, "The norms, rules and motivational values driving sustainable remediation of contaminated environments: A study of implementation.", ---, "Factors influencing residents' acceptance (support) of remediation technologies.", Prior et al., "Using residents' worries about technology as a way of resolving environmental remediation dilemmas.", Prior and Partridge, Technical Report No.17: The Australian experience: A comparative analysis of the effects of contamination and its remediation on individuals and communities at two Australian sites, Prior et al., "'We get the most information from the sources we trust least': residents' perceptions of risk communication on industrial contamination.", Prior and Rai, "Engaging with residents' perceived risks and benefits about technologies as a way of resolving remediation dilemmas.", Prior et al., "A geography of residents' worry about the disruptive effects of contaminated sites.", Connon et al., "Danger from the Outside: Resident Perceptions of Environmental Contamination at Home."

28. Prior et al., "A geography of residents' worry about the disruptive effects of contaminated sites.", p.61

29. See for example: Huynh et al., "Evaluating residents' preferences for remediation technologies: A choice experiment approach.", McIntyre et al., "Sociodemographic predictors of residents worry about contaminated sites.", Prior, "The norms, rules and motivational values driving sustainable remediation of contaminated environments: A study of implementation.", ---, "Factors influencing residents' acceptance (support) of remediation technologies.", Prior et al., "Using residents' worries about technology as

a way of resolving environmental remediation dilemmas.", Prior and Partridge, Technical Report No.17: The Australian experience: A comparative analysis of the effects of contamination and its remediation on individuals and communities at two Australian sites, Prior et al., "'We get the most information from the sources we trust least': residents' perceptions of risk communication on industrial contamination.", Prior and Rai, "Engaging with residents' perceived risks and benefits about technologies as a way of resolving remediation dilemmas.", Prior et al., "A geography of residents' worry about the disruptive effects of contaminated sites.", Connon et al., "Danger from the Outside: Resident Perceptions of Environmental Contamination at Home."

30. See for example: Huynh et al., "Evaluating residents' preferences for remediation technologies: A choice experiment approach.", McIntyre et al., "Sociodemographic predictors of residents worry about contaminated sites.", Prior, "The norms, rules and motivational values driving sustainable remediation of contaminated environments: A study of implementation.", ---, "Factors influencing residents' acceptance (support) of remediation technologies.", Prior et al., "Using residents' worries about technology as a way of resolving environmental remediation dilemmas.", Prior and Partridge, Technical Report No.17: The Australian experience: A comparative analysis of the effects of contamination and its remediation on individuals and communities at two Australian sites, Prior et al., "'We get the most information from the sources we trust least': residents' perceptions of risk communication on industrial contamination.", Prior and Rai, "Engaging with residents' perceived risks and benefits about technologies as a way of resolving remediation dilemmas.", Prior et al., "A geography of residents' worry about the disruptive effects of contaminated sites.", Connon et al., "Danger from the Outside: Resident Perceptions of Environmental Contamination at Home."

31. See for example: Huynh et al., "Evaluating residents' preferences for remediation technologies: A choice experiment approach.", McIntyre et al., "Sociodemographic predictors of residents worry about contaminated sites.", Prior, "The norms, rules and motivational values driving sustainable remediation of contaminated environments: A study of implementation.", ---, "Factors influencing residents' acceptance (support) of remediation technologies.", Prior et al., "Using residents' worries about technology as a way of resolving environmental remediation dilemmas.", Prior and Partridge, Technical Report No.17: The Australian experience: A comparative analysis of the effects of contamination and its remediation on individuals and communities at two Australian sites, Prior et al., "'We get the most information from the sources we trust least': residents' perceptions of risk communication on industrial contamination.", Prior and Rai, "Engaging with residents' perceived risks and benefits about technologies as a way of resolving remediation dilemmas.", Prior et al., "A geography of residents' worry about the disruptive effects of contaminated sites.", Connon et al., "Danger from the Outside: Resident Perceptions of Environmental Contamination at Home."

32. See for example: Huynh et al., "Evaluating residents' preferences for remediation technologies: A choice experiment approach.", McIntyre et al., "Sociodemographic predictors of residents worry about contaminated sites.", Prior, "The norms, rules and motivational values driving sustainable remediation of contaminated environments: A study of implementation.", ---, "Factors influencing residents' acceptance (support) of remediation technologies.", Prior et al., "Using residents' worries about technology as a way of resolving environmental remediation dilemmas.", Prior and Partridge, Technical Report No.17: The Australian experience: A comparative analysis of the effects of contamination and its remediation on individuals and communities at two Australian sites, Prior et al., "'We get the most information from the sources we trust least': residents' perceptions of risk communication on industrial contamination.", Prior and Rai, "Engaging with residents' perceived risks and benefits about technologies as a way of resolving remediation dilemmas.", Prior et al., "A geography of residents' worry about the disruptive effects of contaminated sites.", Connon et al., "Danger from the Outside: Resident Perceptions of Environmental Contamination at Home."

33. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 8.1

34. Ibid., Section 8.1

35. Ibid., Section 8.4

36. See for example: Huynh et al., "Evaluating residents' preferences for remediation technologies: A choice experiment approach.", McIntyre et al., "Sociodemographic predictors of residents worry about contaminated sites.", Prior, "The norms, rules and motivational values driving sustainable remediation of contaminated environments: A study of implementation.", ---, "Factors influencing residents' acceptance (support) of remediation technologies.", Prior et al., "Using residents' worries about technology as a way of resolving environmental remediation dilemmas.", Prior and Partridge, Technical Report No.17: The Australian experience: A comparative analysis of the effects of contamination and its remediation on individuals and communities at two Australian sites, Prior et al., "'We get the most information from the sources we trust least': residents' perceptions of risk communication on industrial contamination.", Prior and Rai, "Engaging with residents' perceived risks and benefits about technologies as a way of resolving remediation dilemmas.", Prior et al., "A geography of residents' worry about the disruptive effects of contaminated sites.", Connon et al., "Danger from the Outside: Resident Perceptions of Environmental Contamination at Home."

37. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement, National Environment Protection Council, National Environment Protection (Assessment of Site Contamination) Measures 1999, Schedule B(8) - Guideline on Community Consultation and Risk Communication, ---, National Environment Protection (Assessment of Site Contamination) Measures 1999, Schedule 1-6, Schedules A and B.

38. United States Environmental Protection Agency, Risk communication in action: the risk communication workbook, EPA/625/R-05/003, National Environment Protection Council, National Environment Protection (Assessment of Site Contamination) Measures 1999, Schedule B(8) - Guideline on Community Consultation and Risk Communication., Section 3,

Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 8.2

39. ---, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 8.4.1

40. Ibid., Section 8.4.2

41. Ibid., Section 8.4

42. Ibid., Section 8.3.1

43. New South Wales Government, Contaminated Land Planning Guidelines: Draft., Appendix 7, ---, Contaminated Land Management Act 1979 No. 140., Section 4. Also see section 11(3) as defined in Part 7A of the EP&A Act.

44. ---, Contaminated Land Planning Guidelines: Draft., Appendix 7, ---, Managing Land Contamination: Planning Guidelines SEPP 55–Remediation of Land., Section 4, ---, Contaminated Land Management Act 1979 No. 140., Section 4

45. For example, one actions that can be required in a management order includes "to advertise and conduct meetings for the public to receive progress reports, and to make comments, on the action taken under the management order or on the plan of management" (Section 16(q)).

46. A development control plan is a document that provides additional, usually more detailed, planning and design guidelines to support the planning controls in a Local Environmental Plan.

47. New South Wales Government, Contaminated Land Planning Guidelines: Draft., section 5

48. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 8.2, National Environment Protection Council, National Environment Protection (Assessment of Site Contamination) Measures 1999, Schedule B(8) - Guideline on Community Consultation and Risk Communication., Section 3

49. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 8.1

50. Ibid., Section 8.1

51. Ibid., Section 8.9.6

52. Ibid., Section 8.2, National Environment Protection Council, National Environment Protection (Assessment of Site Contamination) Measures 1999, Schedule B(8) - Guideline on Community Consultation and Risk Communication., Section 3

53. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 8.2, National Environment Protection Council, National Environment Protection (Assessment of Site Contamination) Measures 1999, Schedule B(8) - Guideline on Community Consultation and Risk Communication., Section 3

54. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 8.2, National Environment Protection Council, National Environment Protection (Assessment of Site Contamination) Measures 1999, Schedule B(8) - Guideline on Community Consultation and Risk Communication., Section 3

55. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 8.6

56. Ibid., Section 8.1

57. Ibid., Section 8.6

58. ibid., Section 8.2, National Environment Protection Council, National Environment Protection (Assessment of Site Contamination) Measures 1999, Schedule B(8) - Guideline on Community Consultation and Risk Communication., Section 3

59. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 8.2, National Environment Protection Council, National Environment Protection (Assessment of Site Contamination) Measures 1999, Schedule B(8) - Guideline on Community Consultation and Risk Communication., Section 3

60. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 8.2, National Environment Protection Council, National Environment Protection (Assessment of Site Contamination) Measures 1999, Schedule B(8) - Guideline on Community Consultation and Risk Communication., Section 3

61. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 7.2

62. Ibid., Section 8.6

63. Ibid., Section 8.2, National Environment Protection Council, National Environment Protection (Assessment of Site Contamination) Measures 1999, Schedule B(8) - Guideline on Community Consultation and Risk Communication., Section 3

64. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 8.2, National Environment Protection Council, National Environment Protection (Assessment of Site Contamination) Measures 1999, Schedule B(8) - Guideline on Community Consultation and Risk Communication., Section 3

65. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 8.2, National Environment Protection Council, National Environment Protection (Assessment of Site Contamination) Measures 1999, Schedule B(8) - Guideline on Community Consultation and Risk Communication., Section 3

66. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 8.2, National Environment Protection Council, National Environment Protection (Assessment of Site Contamination) Measures 1999, Schedule B(8) - Guideline on Community Consultation and Risk Communication., Section 3

67. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 8.2, National Environment Protection Council, National Environment Protection (Assessment of Site Contamination) Measures 1999, Schedule B(8) - Guideline on Community Consultation and Risk Communication., Section 3

68. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 8.2, National Environment Protection Council, National Environment Protection (Assessment of Site Contamination) Measures 1999, Schedule B(8) - Guideline on Community Consultation and Risk Communication., Section 3

69. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 8.2, National Environment Protection Council, National Environment Protection (Assessment of Site Contamination) Measures 1999, Schedule B(8) - Guideline on Community Consultation and Risk Communication., Section 3

70. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 8.2, National Environment Protection Council, National Environment Protection (Assessment of Site Contamination) Measures 1999, Schedule B(8) - Guideline on Community Consultation and Risk Communication., Section 3

71. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 8.2, National Environment Protection Council, National Environment Protection (Assessment of Site Contamination) Measures 1999, Schedule B(8) - Guideline on Community Consultation and Risk Communication., Section 3

72. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 8.1

73. Ibid., Section 8.2, National Environment Protection Council, National Environment Protection (Assessment of Site Contamination) Measures 1999, Schedule B(8) - Guideline on Community Consultation and Risk Communication., Section 3

74. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 8.2, National Environment Protection Council, National Environment Protection (Assessment of Site Contamination) Measures 1999, Schedule B(8) - Guideline on Community Consultation and Risk Communication., Section 3

75. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 8.2, National Environment Protection Council, National Environment Protection (Assessment of Site Contamination) Measures 1999, Schedule B(8) - Guideline on Community Consultation and Risk Communication., Section 3

76. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 8.2, National Environment Protection Council, National Environment Protection (Assessment of Site Contamination) Measures 1999, Schedule B(8) - Guideline on Community Consultation and Risk Communication., Section 3

77. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 8.2, National Environment Protection Council, National Environment Protection (Assessment of Site Contamination) Measures 1999, Schedule B(8) - Guideline on Community Consultation and Risk Communication., Section 3

78. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 8.2, National Environment Protection Council, National Environment Protection (Assessment of Site Contamination) Measures 1999, Schedule B(8) - Guideline on Community Consultation and Risk Communication., Section 3

79. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 8.2, National Environment Protection Council, National Environment Protection (Assessment of Site Contamination) Measures 1999, Schedule B(8) - Guideline on Community Consultation and Risk Communication., Section 3

80. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 8.10.1

81. Ibid., Section 8.2, National Environment Protection Council, National Environment Protection (Assessment of Site Contamination) Measures 1999, Schedule B(8) - Guideline on Community Consultation and Risk Communication., Section 3

82. ---, National Environment Protection (Assessment of Site Contamination) Measures 1999, Schedule B(8) - Guideline on Community Consultation and Risk Communication., Section 8.1, Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement, National Environment Protection Council, National Environment Protection (Assessment of Site Contamination) Measures 1999, Schedule 1-6, Schedules A and B., Section 7

83. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 2

84. Ibid., Section 8.5

85. Ibid., Section 8.4.2

86. See for example: Huynh et al., "Evaluating residents' preferences for remediation technologies: A choice experiment approach.", McIntyre et al., "Sociodemographic predictors of residents worry about contaminated sites.", Prior, "The norms, rules and motivational values driving sustainable remediation of contaminated environments: A study of implementation.", ---, "Factors influencing residents' acceptance (support) of remediation technologies.", Prior et al., "Using residents' worries about technology as a way of resolving environmental remediation dilemmas.", Prior and Partridge, Technical Report No.17: The Australian experience: A comparative analysis of the effects of contamination and its remediation on individuals and communities at two Australian sites, Prior et al., "'We get the most information from the sources we trust least': residents' perceptions of risk communication on industrial contamination.", Prior and Rai, "Engaging with residents' perceived risks and benefits about technologies as a way of resolving remediation dilemmas.", Prior et al., "A geography of residents' worry about the disruptive effects of contaminated sites."

87. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement, National Environment Protection Council, National Environment Protection (Assessment of Site Contamination) Measures 1999, Schedule B(8) - Guideline on Community Consultation and Risk Communication, ---, National Environment Protection (Assessment of Site Contamination) Measures 1999, Schedule 1-6, Schedules A and B.

88. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 8.9

89. Ibid., Section 8.9.5

90. Ibid., Section 8.9.6

91. Ibid., Section 8.9.7

92. McIntyre et al., "Sociodemographic predictors of residents worry about contaminated sites.", Prior et al., "Using residents' worries about technology as a way of resolving environmental remediation dilemmas."

93. McIntyre et al., "Sociodemographic predictors of residents worry about contaminated sites.", Prior et al., "Using residents' worries about technology as a way of resolving environmental remediation dilemmas.", Prior et al., "A geography of residents' worry about the disruptive effects of contaminated sites.", Prior, "Factors influencing residents' acceptance (support) of remediation technologies."

94. McIntyre et al., "Sociodemographic predictors of residents worry about contaminated sites.", Prior et al., "Using residents' worries about technology as a way of resolving environmental remediation dilemmas.", Prior et al., "A geography of residents' worry about

the disruptive effects of contaminated sites."

95. McIntyre et al., "Sociodemographic predictors of residents worry about contaminated sites.", Prior et al., "A geography of residents' worry about the disruptive effects of contaminated sites."
96. McIntyre et al., "Sociodemographic predictors of residents worry about contaminated sites.", Prior et al., "Using residents' worries about technology as a way of resolving environmental remediation dilemmas."
97. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 8.9.6
98. Prior et al., "Using residents' worries about technology as a way of resolving environmental remediation dilemmas."
99. McIntyre et al., "Sociodemographic predictors of residents' worry about contaminated sites."
100. Prior et al., "Using residents' worries about technology as a way of resolving environmental remediation dilemmas."
101. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 8.9.5
102. Ibid., Section 8.9.6
103. McIntyre et al., "Sociodemographic predictors of residents worry about contaminated sites."
104. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 8.9.6
105. Ibid., Section 8.9.7
106. McIntyre et al., "Sociodemographic predictors of residents worry about contaminated sites."
107. Prior et al., "Using residents' worries about technology as a way of resolving environmental remediation dilemmas."
108. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 8.9.5
109. Ibid., Section 8.9.7 and 8.9.8
110. Prior et al., "Using residents' worries about technology as a way of resolving environmental remediation dilemmas."
111. McIntyre et al., "Sociodemographic predictors of residents worry about contaminated sites."
112. Prior et al., "Using residents' worries about technology as a way of resolving environmental remediation dilemmas.", p.888
113. Prior, "Factors influencing residents' acceptance (support) of remediation technologies.", p.1377
114. Ibid., p.1377
115. McIntyre et al., "Sociodemographic predictors of residents worry about contaminated sites."
116. Beder, "Sydney's Toxic Green Olympics."
117. Swane, "Homebush Bay Dioxin Remediation Project."
118. New South Wales Environment Protection Authority, Sydney: Olympic Park.
119. Knaus, WestConnex: The stink of Controversy that Fails to Go Away'.
120. Short, The green and the gold: Can we soften the environmental impact of the Olympics? .
121. Knaus, WestConnex: The stink of Controversy that Fails to Go Away'.
122. Beder, "Sydney's Toxic Green Olympics."
123. Ibid.
124. Prior et al., "Using residents' worries about technology as a way of resolving environmental remediation dilemmas."
125. Peters et al., "Why worry? Worry, risk perceptions, and willingness to act to reduce medical errors."
126. Zlomke and Hahn, "Cognitive emotion regulation strategies: gender differences and associations to worry.."
127. Ibid.

128. Prior et al., "Using residents' worries about technology as a way of resolving environmental remediation dilemmas."

129. Ibid.

130. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 8.9

131. Ibid., Section 8.4.2

132. Ibid., Section 7.4

133. Ibid., Section 8.5 and 8.9.4

134. Ibid., Section 8.5

135. Ibid., Section 8.9.4

136. Ibid., Section 8.5

137. Ibid., Section 8.5

138. Ibid., Section 8.9.1

139. New South Wales Government, Contaminated Land Management Act 1979 No. 140., Section 4 Within the NSW Context a local authority means a local council, or other organisation such as the Lord Howe Island Board, or the NSW EPA in relation to land within the Western Division of NSW.

140. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 8.9.1

141. Ibid., Section 8.9.1

142. Ibid., Section 8.9.1

143. Ibid., Section 8.5

144. Ibid., Section 8.5

145. Ibid., Section 8.5

146. Ibid., Section 8.5

147. Ibid., Section 8.5

148. New South Wales Government, Contaminated Land Management Act 1979 No. 140., Section 4

149. Ibid., Section 5(2)

150. Ibid., Section 4

151. New South Wales Government, Contaminated Land Planning Guidelines: Draft., Appendix 7

152. Ibid., Appendix 7, New South Wales Government, Contaminated Land Management Act 1979 No. 140., Section 4

153. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 8.9.3

154. Ibid., Section 8.9.2

155. McIntyre et al., "Sociodemographic predictors of residents worry about contaminated sites."

156. Prior et al., "Using residents' worries about technology as a way of resolving environmental remediation dilemmas."

157. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 8.9.2

158. Ibid., Section 8.9.2

159. Ibid., Section 8.9.2

160. Ibid., Section 8.9.2

161. Ibid., Section 8.9.2

162. Ibid., Section 8.9.3

163. Ibid., Section 8.9.3

164. Ibid., Section 8.9.3

165. Ibid., Section 8.9.3

166. Ibid., Section 8.9.8

167. McIntyre et al., "Sociodemographic predictors of residents worry about contaminated sites."

168. Global Burden of Disease Study 2013 Collaborators, "Global, regional, and national incidence, prevalence, and years lived with disability for 301 acute and chronic diseases and injuries in 188 countries, 1990–2013: A systematic analysis for the Global Burden of Disease Study 2013."

169. Australian Health Ministers' Advisory Council, National Strategic Framework for Chronic Conditions.

170. McIntyre et al., "Sociodemographic predictors of residents worry about contaminated sites.", Prior et al., "A geography of residents' worry about the disruptive effects of contaminated sites."

171. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 8.9.8

172. McIntyre et al., "Sociodemographic predictors of residents worry about contaminated sites.", Prior et al., "A geography of residents' worry about the disruptive effects of contaminated sites."

173. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 8.9.8

174. City of Canada Bay, Milestones and the Current Situation.

175. McGrath, Sydney Harbour's toxic legacy shows value of green safety net

176. Fletcher et al., "Community Engagement during the Rhodes Remediation Projects."

177. New South Wales Department of Health, Rhodes Peninsula small area cancer incidence and mortality study, .

178. City of Canada Bay, Consultation Process - The Rhodes Community Consultative Committee.

179. New South Wales Department of Health, Rhodes Peninsula small area cancer incidence and mortality study, .

180. City of Canada Bay, Remediation Overview.

181. New South Wales Department of Health, Rhodes Peninsula small area cancer incidence and mortality study, .

182. Ibid.

183. Stapleton, From Toxic Dump to Hotspot: Rhodes, The Sydney Suburb that's Risen from the Dead.

184. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Transparency 'key to successful clean-up'.

185. Prior et al., "A geography of residents' worry about the disruptive effects of contaminated sites."

186. Kuchinskaya, "Twice invisible: Formal representations of radiation danger ".

187. Scully, Disability and vulnerability: on bodies, dependence, and power.

188. Wiesel, "Community and the geography of people with intellectual disability."

189. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 7.4

190. See for example: Huynh et al., "Evaluating residents' preferences for remediation technologies: A choice experiment approach.", McIntyre et al., "Sociodemographic predictors of residents worry about contaminated sites.", Prior, "The norms, rules and motivational values driving sustainable remediation of contaminated environments: A study of implementation.", ---, "Factors influencing residents' acceptance (support) of remediation technologies.", Prior et al., "Using residents' worries about technology as a way of resolving environmental remediation dilemmas.", Prior and Partridge, Technical Report No.17: The Australian experience: A comparative analysis of the effects of contamination and its remediation on individuals and communities at two Australian sites, Prior et al., "'We get the most information from the sources we trust least': residents' perceptions of risk communication on industrial contamination.", Prior and Rai, "Engaging with residents' perceived risks and benefits about technologies as a way of

resolving remediation dilemmas.", Prior et al., "A geography of residents' worry about the disruptive effects of contaminated sites."

191. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement, National Environment Protection Council, National Environment Protection (Assessment of Site Contamination) Measures 1999, Schedule B(8) - Guideline on Community Consultation and Risk Communication, ---, National Environment Protection (Assessment of Site Contamination) Measures 1999, Schedule 1-6, Schedules A and B.

192. New South Wales Government, Contaminated Land Management Act 1979 No. 140., Section 4(1)

193. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 8.1

194. New South Wales Government, Contaminated Land Planning Guidelines: Draft., Appendix 7

195. State of New South Wales and New South Wales Office of Environment and Heritage, Guidlines for consultants reporting on contaminated sites, New South Wales Government, Contaminated Land Planning Guidelines: Draft., Section 3

196. ---, Contaminated Land Planning Guidelines: Draft., Section 3, State of New South Wales and New South Wales Office of Environment and Heritage, Guidlines for consultants reporting on contaminated sites.

197. For example, is any known or potential contamination on nearby or neighbouring properties, or in nearby groundwater, and whether that contamination (e.g. is the site adjacent to a site on the EPA's list of notified sites or a site on the EPA's public register).

198. New South Wales Government, Contaminated Land Planning Guidelines: Draft., Section 2 and Appendix 7

199. Ibid., Section 2 and 4

200. Ibid., Section 2

201. New South Wales Government, Contaminated Land Management Act 1979 No. 140., Section 4

202. ---, Contaminated Land Planning Guidelines: Draft., Section 3

203. Ibid., Section 3

204. Ibid., Appendix 7, New South Wales Government, Contaminated Land Management Act 1979 No. 140., Section 4

205. ---, Contaminated Land Planning Guidelines: Draft., Section 4

206. Ibid., Section 5

207. Ibid., Section 5

208. Prior et al., "A geography of residents' worry about the disruptive effects of contaminated sites."

209. Ibid., p.59

210. Ibid.

211. McIntyre et al., "Sociodemographic predictors of residents worry about contaminated sites."

212. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 7.4

213. Ibid., Section 7.4

214. Ibid., Section 8.5

215. Ibid., Section 7.4

216. Ibid., Section 7.4

217. Ibid., Section 7.4

218. National Environment Protection Council, National Environment Protection (Assessment of Site Contamination) Measures 1999, Schedule 1-6, Schedules A and B., Section 8

219. State of New South Wales and New South Wales Office of Environment and Heritage, Guidlines for consultants reporting on contaminated sites.

220. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 7.4

221. Couch and Coles, "Community stress, psychosocial hazards, and EPA decision-making in communities impacted by chronic technological disasters."

222. Cuthbertson et al., "Angry, scared, and unsure: Mental health consequences of contaminated water in Flint, Michigan."

223. Prior et al., "Using residents' worries about technology as a way of resolving environmental remediation dilemmas."

224. Takebayashi et al., "Risk perception and anxiety regarding radiation after the 2011 Fukushima nuclear power plant accident: A systematic qualitative review."

225. Prior et al., "Using residents' worries about technology as a way of resolving environmental remediation dilemmas."

226. Parsons Brinckerhoff and New South Wales Government State Property Authority, Remediation of former Radium Hill Company site Nelson Parade Hunters Hill environmental assessment.

227. Aston, Radioactive waste haunts Hunters Hill residents.

228. MacMillan, Hunters Hill residents wary of latest announcement on uranium contamination.

229. Deare, Radioactive refinery waste site at Hunters Hill a hot topic.

230. MacMillan, Hunters Hill residents wary of latest announcement on uranium contamination.

231. Sydney Harbour Federation Trust, HMAS Platypus Comprehensive Plan Amendment.

232. Ibid.

233. Wallace, "Returning Sydney site to the people."

234. Sydney Harbour Federation Trust, Platypus - Management Plan.

235. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 7.4

236. Ibid., Section 7.2

237. McIntyre et al., "Sociodemographic predictors of residents worry about contaminated sites.", Prior et al., "Using residents' worries about technology as a way of resolving environmental remediation dilemmas."

238. McIntyre et al., "Sociodemographic predictors of residents worry about contaminated sites."

239. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 7.4

240. Ibid., Section 7.2

241. Ibid., Section 7.2

242. Ibid., Section 8.9.6

243. McIntyre et al., "Sociodemographic predictors of residents worry about contaminated sites."

244. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 8.9.6

245. McIntyre et al., "Sociodemographic predictors of residents worry about contaminated sites."

246. Yet to be published data from Australian research.

247. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 8.9.7

248. McIntyre et al., "Sociodemographic predictors of residents worry about contaminated sites."

249. Ibid.

250. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 7.2

251. Ibid., Section 7.2

252. McIntyre et al., "Sociodemographic predictors of residents worry about contaminated sites."

253. Ibid.

254. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 7.2

255. Ibid., Section 7.4

256. McIntyre et al., "Sociodemographic predictors of residents worry about contaminated sites."

257. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 7.4

258. Ibid., Section 7.2

259. New South Wales Government, Contaminated Land Planning Guidelines: Draft., Appendix 7

260. McIntyre et al., "Sociodemographic predictors of residents worry about contaminated sites."

261. Prior et al., "A geography of residents' worry about the disruptive effects of contaminated sites."

262. Ibid.

263. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 7.4

264. New South Wales Government, Contaminated Land Management Act 1979 No. 140., Section 12(1)(b)

265. ---, Managing Land Contamination: Planning Guidelines SEPP 55–Remediation of Land., Section 4

266. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 8.5

267. Ibid., Section 8.5

268. Ibid., Section 7.4

269. New South Wales Government, Contaminated Land Management Act 1979 No. 140., Section 12(1)(f)

270. Ibid., Section 12(1)(d) and 12(1)(e)

271. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 7.4 and Section 8.4.2

272. Ibid., Section 7.4 and 8.4.2

273. Ibid., Section 7.2

274. Ibid., Section 7.4 and 8.4.2

275. Ibid., Section 7.4, Prior et al., "A geography of residents' worry about the disruptive effects of contaminated sites.", p.60

276. New South Wales Government, Contaminated Land Management Act 1979 No. 140., Section 12(1)(a)

277. Ibid., Section 12(1)(c)

278. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 7.2

279. Ibid., Section 8.4.2

280. Ibid., Section 7.4 and 8.4.2

281. Ibid., Section 7.2

282. Ibid., Section 7.4

283. New South Wales Government, Contaminated Land Management Act 1979 No. 140., Section 12(1)(a)

284. Ibid., Section 12(1)(c)

285. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 7.2

286. Ibid., Section 7.4

287. Ibid., Section 8.4.2

288. Connon et al., "Danger from the Outside: Resident Perceptions of Environmental Contamination at Home."

289. McIntyre et al., "Sociodemographic predictors of residents worry about contaminated sites."

290. Prior et al., "A geography of residents' worry about the disruptive effects of contaminated sites."

291. Prior et al., "Using residents' worries about technology as a way of resolving environmental remediation dilemmas."

292. Ibid.

293. Prior et al., "A geography of residents' worry about the disruptive effects of contaminated sites.", p.60-61

294. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 8.9.2

295. New South Wales Government, Contaminated Land Planning Guidelines: Draft., Section 4

296. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 7.2

297. Ibid., Section 8.1

298. Prior, "Factors influencing residents' acceptance (support) of remediation technologies.", Prior et al., "Using residents' worries about technology as a way of resolving environmental remediation dilemmas.", Prior and Rai, "Engaging with residents' perceived risks and benefits about technologies as a way of resolving remediation dilemmas.", Huynh et al., "Evaluating residents' preferences for remediation technologies: A choice experiment approach."

299. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement.

300. Ibid., Section 8.4

301. New South Wales Government, Contaminated Land Management Act 1979 No. 140., Section 4(1), ---, Contaminated Land Planning Guidelines: Draft., Appendix 7

302. ---, Contaminated Land Planning Guidelines: Draft., Appendix 7

303. Ibid., Section 3

304. Ibid., Section 3 and 4 A remediation plan may be a stand alone document or part of a environmental impact statement for the site, if the remediation work is designated development or State significant development.

305. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 8.4

306. New South Wales Government, Contaminated Land Planning Guidelines: Draft., Appendix 7, ---, Managing Land Contamination: Planning Guidelines SEPP 55–Remediation of Land., Section 4

307. Category 1 includes any remediation work undertaken on environmentally sensitive land and remediation that is designated development, and Category 2 remediation works include all remediation works not included in Category 1 ---, Contaminated Land Planning Guidelines: Draft., Section 4

308. Ibid., Section 3 and 4

309. Ibid., Section 4 and Appendix 3

310. Ibid., Appendix 3

311. Ibid., Appendix 4 and 5

312. Ibid., Appendix 4 and 5

313. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 8.4

314. New South Wales Government, Contaminated Land Planning Guidelines: Draft., Appendix 7

315. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 8.4

316. New South Wales Government, Contaminated Land Planning Guidelines: Draft., Appendix 7

317. Ibid., Section 3

318. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 8.4

319. New South Wales Government, Contaminated Land Management Act 1979 No. 140., Section 4

320. ---, Contaminated Land Planning Guidelines: Draft., Appendix 7, ---, Contaminated Land Management Act 1979 No. 140., Section 4

321. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 8.4

322. The NSW EPA guidelines for the NSW Site Auditor Scheme sets out the obligations of site auditors in conducting a site audit and the administrative framework supporting the site auditor scheme.

323. New South Wales Government, Contaminated Land Planning Guidelines: Draft., Section 3 and Appendix 7, ---, Contaminated Land Management Act 1979 No. 140., Section 4

324. ---, Contaminated Land Planning Guidelines: Draft., Section 3

325. Ibid., Appendix 7, New South Wales Government, Contaminated Land Management Act 1979 No. 140., Section 4

326. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 8.4

327. New South Wales Government, Contaminated Land Planning Guidelines: Draft., Section 4

328. This may include: development approvals for Category 1 remediation works, and any associated remediation plans or environmental management plans; notifications of Category 2 remediation work, including associated remediation plans; notifications of completion of Category 2 remediation works; site audit statements; determinations for development applications that were refused because of contamination-related issues; planning proposals that did not proceed because of contamination-related issues; planning proposals which included information about land contamination; information provided to the planning authority by the NSW EPA in relation to contaminated land; licences and notices issued under the Protection of the Environment Operations Act 1997 or declarations, orders and notices and approved voluntary management proposals under the CLM Act, and resulting action. All records should include the source of the information, its date and the purpose for which it was collected. See: ibid., Section 5

329. Under section 10.7 (previously referred to as section 149) of the EP&A Act, a person may request a council to issue a planning certificate. The certificate must contain advice on matters about land include council and other public authority policies on hazard risk restrictions. Policies on hazard risk restrictions includes policies that restrict the development of the land concerned due to risks such as those arising from contamination. Section 59 of the CLM Act requires the following matters to be specified on a section 10.7 (2) certificate: that the land is significantly contaminated land; that the land to which the certificate relates is subject to a management order; that the land is the subject of an approved voluntary management proposal; that the land is subject to an ongoing maintenance order; and that the land is the subject of a site audit statement. Information relating to contamination, remediation and management may be provided under section 10.7 (5) certificate if council decides that it is a relevant matter affecting the land.

330. Barr, Former Kolotex Site Looks Set to Receive 287 Apartments When Joint Regional Planning Panel Decides Fate.

331. Barwell, Haberfield petrol station is the latest contaminated site in government register of toxic land---.

332. O'Rouke, Historic Lead Contamination Means the Soil in three out of Four Inner West Gardens Contains Potentially Dangerous Levels of the Chemical---.

333. Ibid.

334. Chen, Greenland Runs Afoul of the Law Over Contaminated Sydney Site.

335. New South Wales Government Department of Planning and Infrastructure, Planning Proposal, Kolotex and Labelcraft Site, 22 & 30-40 George Street, Leichhardt.

336. Chen, Greenland Runs Afoul of the Law Over Contaminated Sydney Site.

337. Barwell, Haberfield petrol station is the latest contaminated site in government register of toxic land.

338. Ibid.

339. Rouillon et al., Elevated Lead Levels in Sydney Back Yards: Here's What you Can Do.

340. Chen, Greenland Runs Afoul of the Law Over Contaminated Sydney Site.

341. New South Wales Environment Protection Authority, EPA Order Greenland to Clean Up Contaminated Site in Leichhardt.

342. Ibid.

343. Barr, Former Kolotex Site Looks Set to Receive 287 Apartments When Joint Regional Planning Panel Decides Fate.

344. Rouillon et al., Elevated Lead Levels in Sydney Back Yards: Here's What you Can Do.

345. Barr, Former Kolotex Site Looks Set to Receive 287 Apartments When Joint Regional Planning Panel Decides Fate.

346. Ibid.

347. Ibid.

348. Ibid.

349. Rouillon et al., Elevated Lead Levels in Sydney Back Yards: Here's What you Can Do.

350. Ibid.

351. O'Rouke, Historic Lead Contamination Means the Soil in three out of Four Inner West Gardens Contains Potentially Dangerous Levels of the Chemical.

352. Ibid.

353. Rouillon et al., Elevated Lead Levels in Sydney Back Yards: Here's What you Can Do.

354. Prior, "Factors influencing residents' acceptance (support) of remediation technologies."

355. Terwel and Daamen, "Initial public reactions to carbon capture and storage (CCS): differentiating general and local views."

356. Wallquist et al., "Lay concepts on CCS deployment in Switzerland based on qualitative interviews."

357. Prior, "Factors influencing residents' acceptance (support) of remediation technologies."

358. Ibid.

359. New South Wales Government, Contaminated Land Planning Guidelines: Draft., Appendix 4

360. Ibid., Section 4

361. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 7.4

362. Ibid., Section 8.5, New South Wales Government, Contaminated Land Planning Guidelines: Draft., Appendix 5

363. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 8.5

364. Ibid., Section 8.5

365. New South Wales Government, Contaminated Land Planning Guidelines: Draft., Appendix 4, Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 8.5

366. Prior et al., "A geography of residents' worry about the disruptive effects of contaminated sites.", p.60

367. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 8.9.2

368. Ibid., Section 7.2

369. Ibid., Section 7.2

370. Ibid., Section 7.2, New South Wales Government, Contaminated Land Planning Guidelines: Draft., Appendix 4

371. Prior et al., "Using residents' worries about technology as a way of resolving environmental remediation dilemmas.", p.892

372. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 8.4.1

373. New South Wales Government, Contaminated Land Planning Guidelines: Draft., Appendix 5

374. Ibid., Appendix 4

375. Ibid., Appendix 5

376. Ibid., Appendix 4

377. Prior and Rai, "Engaging with residents' perceived risks and benefits about technologies as a way of resolving remediation dilemmas.", p.1659

378. Prior et al., "Using residents' worries about technology as a way of resolving environmental remediation dilemmas.", p.892

379. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 8.4.1

380. New South Wales Government, Contaminated Land Planning Guidelines: Draft., Appendix 4

381. Prior and Rai, "Engaging with residents' perceived risks and benefits about technologies as a way of resolving remediation dilemmas.", p.1654

382. New South Wales Government, Contaminated Land Planning Guidelines: Draft., Appendix 4

383. Prior and Rai, "Engaging with residents' perceived risks and benefits about technologies as a way of resolving remediation dilemmas.", p.1654

384. Ibid., p.1654

385. New South Wales Government, Contaminated Land Management Act 1979 No. 140., Section 12(1)(d) and 12(1)(e), Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 8.4.2

386. ---, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 7.4 and Section 8.4.2

387. Ibid., Section 7.4 and 8.4.2

388. New South Wales Government, Contaminated Land Planning Guidelines: Draft., Appendix 4 and 5. Examples of type of actions that may be undertaken within these plans to reduce amenity, and any nuisance from the remediation the site include: Air quality (e.g. ensure no burning of material on site, maintain equipment in functional manner to minimise exhaust emissions, establish dust suppression and control measures to minimise wind borne emissions of dust, having regard to site specific wind conditions). Water quality (e.g. store water for dust suppression in adequately bunded area and drain to a central collection sump and treat, if necessary, to meet EPA discharge criteria), erosion and sediment control (e.g. establish temporary erosion and sediment control measures prior to commencement, maintain erosion and sediment control measures in functional condition), Noise (e.g. ensure plant equipment is noise suppressed).

389. Ibid., Appendix 5

390. Ibid., Appendix 4

391. Prior and Rai, "Engaging with residents' perceived risks and benefits about technologies as a way of resolving remediation dilemmas.", p.1654

392. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 7.2

393. Ibid., Section 7.4

394. Prior and Rai, "Engaging with residents' perceived risks and benefits about technologies as a way of resolving remediation dilemmas."

395. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 8.4

396. New South Wales Government, Contaminated Land Planning Guidelines: Draft., Appendix 4

397. Ibid., Appendix 4

398. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 8.4.1

399. Ibid., Section 7.2

400. Prior, "Factors influencing residents' acceptance (support) of remediation technologies.", p.1370-1371

401. Huynh et al., "Evaluating residents' preferences for remediation technologies: A choice experiment approach.", p.1016

402. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement, ---, Identifying and Selecting Remediation Options, National Environment Protection Council, National Environment Protection (Assessment of Site Contamination) Measures 1999, Schedule B(8) - Guideline on Community Consultation and Risk Communication, Sustainable Remediation Forum Australia et al., A Framework for Assessing the Sustainability of Soil and Groundwater Remediation.

403. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 7.2

404. Prior and Rai, "Engaging with residents' perceived risks and benefits about technologies as a way of resolving remediation dilemmas.", p.1650

405. Ibid., p.1650

406. Ibid., p.1657 and 1661

407. Prior, "Factors influencing residents' acceptance (support) of remediation technologies.", p.1375

408. Prior et al., "Using residents' worries about technology as a way of resolving environmental remediation dilemmas.", p.890

409. Prior and Rai, "Engaging with residents' perceived risks and benefits about technologies as a way of resolving remediation dilemmas.", p.1657

410. Huynh et al., "Evaluating residents' preferences for remediation technologies: A choice experiment approach.", p.1019

411. New South Wales Government, Contaminated Land Management Act 1979 No. 140., Section 4

412. Prior et al., "Using residents' worries about technology as a way of resolving environmental remediation dilemmas.", p. 890

413. Prior and Rai, "Engaging with residents' perceived risks and benefits about technologies as a way of resolving remediation dilemmas.", p. 1375

414. Prior, "Factors influencing residents' acceptance (support) of remediation technologies.", p.1375

415. New South Wales Government, Contaminated Land Planning Guidelines: Draft., Appendix 4

416. Prior and Rai, "Engaging with residents' perceived risks and benefits about technologies as a way of resolving remediation dilemmas.", p.1657

417. Prior, "Factors influencing residents' acceptance (support) of remediation technologies.", p.1375

418. Prior et al., "Using residents' worries about technology as a way of resolving environmental remediation dilemmas.", p.890

419. Ibid., p.891

420. Prior and Rai, "Engaging with residents' perceived risks and benefits about technologies as a way of resolving remediation dilemmas.", p.1657

421. Prior, "Factors influencing residents' acceptance (support) of remediation technologies.", p. 1375-1376

422. Prior et al., "Using residents' worries about technology as a way of resolving environmental remediation dilemmas.", p.891

423. Prior and Rai, "Engaging with residents' perceived risks and benefits about technologies as a way of resolving remediation dilemmas.", p.1658

424. Prior et al., "Using residents' worries about technology as a way of resolving environmental remediation dilemmas.", p.891, Prior, "Factors influencing residents' acceptance (support) of remediation technologies.", p.1376, Prior and Rai, "Engaging with residents' perceived risks and benefits about technologies as a way of resolving remediation dilemmas.", p.1659

425. Prior et al., "Using residents' worries about technology as a way of resolving environmental remediation dilemmas.", p.888

426. Ibid., p.888

427. Prior and Rai, "Engaging with residents' perceived risks and benefits about technologies as a way of resolving remediation dilemmas.", p.1659

428. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 7.4

429. Prior and Rai, "Engaging with residents' perceived risks and benefits about technologies as a way of resolving remediation dilemmas.", p.1600

430. Ibid., p.1600

431. Prior, "Factors influencing residents' acceptance (support) of remediation technologies.", p.1377

432. Prior and Rai, "Engaging with residents' perceived risks and benefits about technologies as a way of resolving remediation dilemmas.", p.1600

433. Prior, "Factors influencing residents' acceptance (support) of remediation technologies.", p.1377

434. New South Wales Government, Contaminated Land Planning Guidelines: Draft., Appendix 5

435. Prior et al., "Using residents' worries about technology as a way of resolving environmental remediation dilemmas.", p.891

436. Prior, "Factors influencing residents' acceptance (support) of remediation technologies.", p.1376

437. Prior et al., "Using residents' worries about technology as a way of resolving environmental remediation dilemmas.", p.891

438. Prior, "Factors influencing residents' acceptance (support) of remediation technologies.", p.1377

439. Prior et al., "Using residents' worries about technology as a way of resolving environmental remediation dilemmas.", p.892

440. Prior and Rai, "Engaging with residents' perceived risks and benefits about technologies as a way of resolving remediation dilemmas.", p.1659

441. Prior, "Factors influencing residents' acceptance (support) of remediation technologies.", p.1376

442. Prior et al., "Using residents' worries about technology as a way of resolving environmental remediation dilemmas.", p.892

443. Prior, "Factors influencing residents' acceptance (support) of remediation technologies.", p.1377

444. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 7.4

445. In a recent study, respondents provided insights into why their combined trust in businesses, scientific institutions or government played a key role in alleviating or generating worry. Government was seen as the ultimate regulator of technologies, companies were seen as the implementers of technologies and scientific institutions were seen as key knowledge holders for technologies. Together, these three organisational types were thought to support the three key services that are needed for the effective application of remediation technologies to a local context: regulation, implementation and knowledge. Distrust in any of these organisations (although to a lesser extent scientific institutions) brought into play uncertainties about one or more of the key services that were required to implement remediation technologies effectively, the result being that residents were unable to use their trust of these organisations as a means to shut down or ameliorate their worry over the remediation technologies. See Prior et al., "Using residents' worries about technology as a way of resolving environmental remediation dilemmas.", p.889

446. Prior, "Factors influencing residents' acceptance (support) of remediation technologies.", p.1378-1380

447. Ibid., p.1378-1380

448. Ibid., p. 1378

449. Best and de Valence, ICI Dulux paint manufacturing factory.

450. Chan, "Stigma and its Assessment Methods."

451. Dulux, Health & Safety: Lead in Paint, Technical Advice, Version 1.0.

452. Beale, Soil cleaner a ground-breaker.

453. Best and de Valence, ICI Dulux paint manufacturing factory.

454. Healey, Waste Management.

455. Yao et al., "Review on Remediation Technologies of Soil Contaminated by Heavy Metals."

456. Ibid.

457. Ibid.

458. Prior and Rai, "Engaging with residents' perceived risks and benefits about technologies as a way of resolving remediation dilemmas."

459. Focht and Albright, Enhancing Stakeholder Acceptance of Bioremediation Technologies.

460. Hoban, "Trends in consumer attitudes about agricultural biotechnology.."

461. Page and Atkinson-Grosjean, "Mines and microbes: public responses to biological treatment of toxic discharge."

462. Prior and Rai, "Engaging with residents' perceived risks and benefits about technologies as a way of resolving remediation dilemmas."

463. Ibid.

464. Tonin and Turvani, "Redeveloping industrial land: are contamination and remediation schemes affecting the price of industrial real estate properties? ."

465. Tütem and Apak, The Role of Metal-Ligand Complexation Equilibria in the Retention and Mobilization of Heavy Metals in Soil.

466. Walsh et al., By-products of the Thermal Treatment of Hazardous Waste: Formation and Health Effects.

467. Chan, The Impact of Environmental Planning on the Value of Contaminated Land.

468. Prior, "Factors influencing residents' acceptance (support) of remediation technologies.", Prior et al., "Using residents' worries about technology as a way of resolving environmental remediation dilemmas.", Prior and Rai, "Engaging with residents' perceived risks and benefits about technologies as a way of resolving remediation dilemmas.", Huynh et al., "Evaluating residents' preferences for remediation technologies: A choice experiment approach."

469. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement.

470. Ibid., Section 7.1

471. Ibid., Section 7.4

472. Ibid., Section 7.4

473. Ibid., Section 7.4

474. Techniques in this table are synthesised from the ibid., Section 8.8 and discussions with engagement consultants working on engagement plans for contaminated sites in NSW. The NRF list of techniques is itself a synthesis of Schedule B (8), Guideline on community engagement and risk communication, in NEPC 1999, NEPM (Assessment of Site Contamination), as amended, pp 16-19, and Community consultation guideline, Contaminated sites management series, WA DEC 2006, pp 17-20)

475. Ibid., Section 7.1

476. Ibid., Section 8.9.8

477. Ibid., Section 8.9.2.

478. Ibid., Section 8.9.4

479. Ibid., Section 8.3.1

480. Ibid., Section 8.3.1

481. Ibid., Section 8.5

482. Ibid., Section 8.9.4

483. Ibid., Section 8.3.2.

484. Ibid., Section 8.9.5

485. Ibid., Section 8.9.4

486. Ibid., Section 8.9.1

487. Ibid., Section 8.9.4

488. Ibid., Section 8.9.4

489. Ibid., Section 8.9.4

490. Ibid., Section 8.9.2

491. Ibid., Section 8.9.4

492. Ibid., Section 8.3.3

493. Ibid., Section 8.9.3

494. Prior et al., "Using residents' worries about technology as a way of resolving environmental remediation dilemmas.", p.890

495. Prior and Rai, "Engaging with residents' perceived risks and benefits about technologies as a way of resolving remediation dilemmas.", p.1660

496. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 8.9.3

497. Ibid., Section 8.9.9

498. Ibid., Section 8.9.9

499. Ibid., Section 8.9.7

500. Ibid., Section 8.9.8

501. Ibid., Section 8.9.8

502. Ibid., Section 8.9.8

503. Ibid., Section 8.9.8

504. Ibid., Section 8.9.8

505. Ibid., Section 8.9.8

506. Ibid., Section 8.9.8

507. Ibid., Section 8.9.3

508. Ibid., Section 8.9.3

509. Ibid., Section 8.9.5

510. Ibid., Section 8.9.4

511. Ibid., Section 8.9.5

512. Ibid., Section 8.9.1

513. Ibid., Section 8.4.2

514. Ibid., Section 8.5

515. Ibid., Section 8.9.4

516. Ibid., Section 8.9.4

517. Ibid., Section 7.2

518. Ibid., Section 7.2

519. Ibid., Section 7.2

520. Prior and Rai, "Engaging with residents' perceived risks and benefits about technologies as a way of resolving remediation dilemmas.", p.1650

521. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement, ---, Identifying and Selecting Remediation Options, National

Environment Protection Council, National Environment Protection (Assessment of Site Contamination) Measures 1999, Schedule B(8) - Guideline on Community Consultation and Risk Communication, Sustainable Remediation Forum Australia et al., A Framework for Assessing the Sustainability of Soil and Groundwater Remediation.

522. National Environment Protection Council, National Environment Protection (Assessment of Site Contamination) Measures 1999, Schedule B(8) - Guideline on Community Consultation and Risk Communication., Section 4.2.10, Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 7.4

523. National Environment Protection Council, National Environment Protection (Assessment of Site Contamination) Measures 1999, Schedule B(8) - Guideline on Community Consultation and Risk Communication., Section 4.2.2, Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 7.4

524. ---, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 8.5

525. National Environment Protection Council, National Environment Protection (Assessment of Site Contamination) Measures 1999, Schedule B(8) - Guideline on Community Consultation and Risk Communication., Section 4.2.8

526. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement., Section 8.10.2

527. Ibid., Section 8.10.3

528. Ibid., Section 8.4

529. Ibid., Section 8.9

530. Ibid., Section 8.7

531. Ibid., Section 8.7

532. Ibid., Section 8.7

533. Ibid., Section 8.7

534. Chan, The Worst Groundwater Contamination Incident in the Southern Hemisphere – A Case study of Orica's Botany Industrial Park.

535. Peatling, Contested bay clean-up may take 30 years.

536. New South Wales Environment Protection Authority, Independent review into off-site mercury at Orica Botany.

537. Carson, "Deliberative public participation and hexachlorobenzene stockpiles."

538. Ibid.

539. Ibid.

540. Ibid.

541. Ibid.

542. Lloyd-Smith, "Community Empowerment to Support Cooperative Environmentally Sound Management."

543. Ibid.

544. Lloyd-Smith and Bell, "Toxic disputes and the rise of environmental justice in Australia."

545. Rae and Brown, "Managing the intractable: communicative structures for hexachlorobenzene and other scheduled wastes."

546. Orica, Past community outreach projects for the Botany Groundwater Cleanup Project.

547. ---, Botany Remediation Projects: Community.

548. Prior, "Factors influencing residents' acceptance (support) of remediation technologies."

549. Ibid.

550. Prior et al., "'We get the most information from the sources we trust least': residents' perceptions of risk communication on industrial contamination."

551. Prior, “Factors influencing residents’ acceptance (support) of remediation technologies.”

552. Ibid.

553. Prior and Partridge, Experiencing the toxic city: Effects of contamination and its remediation on individuals and communities in Urban Australia.

554. National Environment Protection Council, National Environment Protection (Assessment of Site Contamination) Measures 1999, Schedule B(8) - Guideline on Community Consultation and Risk Communication, Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement.

555. New South Wales Government, Contaminated Land Planning Guidelines: Draft., Appendix 7, ---, Contaminated Land Management Act 1979 No. 140., Section 5(1), ---, Managing Land Contamination: Planning Guidelines SEPP 55–Remediation of Land., Section 4

556. ---, Contaminated Land Management Act 1979 No. 140., Section 4

557. Ibid., Section 4

558. Ibid., Section 4

559. Ibid., Section 4

560. National Environment Protection Council, National Environment Protection (Assessment of Site Contamination) Measures 1999, Schedule B(8) - Guideline on Community Consultation and Risk Communication, Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement.

561. Heath et al., Engaging the Community: a handbook for professionals managing contaminated land.

562. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement.

563. Heath et al., Engaging the Community: a handbook for professionals managing contaminated land.

564. New South Wales Government, Managing Land Contamination: Planning Guidelines SEPP 55–Remediation of Land., Section 4

565. Heath et al., Engaging the Community: a handbook for professionals managing contaminated land.

566. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement.

567. ---, Application Guide for Identifying and Selecting Remediation Options.

568. National Environment Protection Council, National Environment Protection (Assessment of Site Contamination) Measures 1999, Schedule B(8) - Guideline on Community Consultation and Risk Communication.

569. Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, Remediation and management of contaminated sites Guideline for stakeholder engagement.

570. ---, Defining the philoshopy, context and principles of the National Remediation Framework for remediation and management of contaminated sites in Australia

571. Sustainable Remediation Forum Australia et al., A Framework for Assessing the Sustainability of Soil and Groundwater Remediation.

REFERENCE LIST

Aston, H. 2011. "Radioactive waste haunts Hunters Hill residents." The North West Star, 20/10/2011. https://www.northweststar.com.au/story/938556/radioactive-waste-haunts-hunters-hill-residents/

Australian and New Zealand Environment and Conservation Council, and National Health and Medical Research Council. 1992. Australian and New Zealand Guidelines for the Assessment and Management of Contaminated Sites. Australian and New Zealand Environment and Conservation Council.

Australian Capital Territory Environment Protection Authority. 2009. Contaminated Sites Environmental Protection Policy. Australian Capital Territory, Canberra: Australian Capital Territory Environment Protection Authority.

Australian Health Ministers' Advisory Council. 2017. National Strategic Framework for Chronic Conditions. Canberra: Australian Government.

Barr, E. 2015. "Former Kolotex Site Looks Set to Receive 287 Apartments When Joint Regional Planning Panel Decides Fate." The Daily Telegraph, 17/06/2015. https://www.dailytelegraph.com.au/newslocal/inner-west/former-kolotex-site-looks-set-to-receive-287-apartments-when-joint-regional-planning-panel-decides-fate/news-story/d7b34cc714f896d38affc139ef108069.

Barwell, D. 2017. "Haberfield petrol station is the latest contaminated site in government register of toxic land." The Daily Telegraph, 02/05/2017. https://www.dailytelegraph.com.au/newslocal/inner-west/haberfield-petrol-station-the-latest-contaminated-site-in-government-register-of-toxic-land/news-story/dd73cbf041b6e51a19d21964af5cc732

Beale, B. 1996. "Soil cleaner a ground-breaker." Sydney Morning Herald, 26/03/1996. https://www.newspapers.com/newspage/122365104

Beder, S. 1993. "Sydney's Toxic Green Olympics." Current Affairs Bulletin 70 (6):12-18.

Best, R., and G. de Valence. 2002. "ICI Dulux paint manufacturing factory." In Design and Construction: Designing in Value, 208. Oxford, UK: Butterworth and Heinemann.

Carson, L. 2009. "Deliberative public participation and hexachlorobenzene stockpiles." Journal of Environmental Management 90 (4):1636-1643.

Chan, N. 1997. "The Impact of Environmental Planning on the Value of Contaminated Land." 4th Pacific Rim Real Estate Society Conference, Perth Australia, 19-21 January

Chan, N. 2001. "Stigma and its Assessment Methods." Pacific Rim Property Research 13:131-141.

Chan, N. 2006. "The Worst Groundwater Contamination Incident in the Southern Hemisphere – A Case study of Orica's Botany Industrial Park." Pacific Rim Real Estate Society Annual Conference, Auckland, New Zealand, 22-25 January 2006

Chen, O. 2016. "Greenland Runs Afoul of the Law Over Contaminated Sydney Site." Asia Real Estate Intelligence, 13/07/2016. https://www.mingtiandi.com/real-estate/outbound-investment/sygreenland-runs-afoul-of-the-law-over-contaminated-sydney-site/.

City of Canada Bay. 2014a. "Consultation Process - The Rhodes Community Consultative Committee." accessed 28/01/2019. http://www.canadabay.nsw.gov.au/rhodes/remediation---remediation---the-process---consultation-process-the-rhodes-community.html

City of Canada Bay. 2014b. "Milestones and the Current Situation." accessed 28/01/2019. http://canadabay.nsw.gov.au/rhodes/remediation---milestones-and-current-situation---main-page.html//acctab1.

City of Canada Bay. 2014c. "Remediation Overview." accessed 28/01/2019. http://www.canadabay.nsw.gov.au/rhodes/rhodes/remediation---remediation-overview---main-page.html//acctab10

Connon, I. L. C., J. Prior, and D. Fam. 2018. "Danger from the Outside: Resident Perceptions of Environmental Contamination at Home." Human Ecology Review 24 (2):129-151.

Cooperative Research Centre for Contamination Assessment and Remediation of the Environment. 2013a. Defining the philosphy, context and principles of the National Remediation Framework for remediation and management of contaminated sites in Australia Adelaide, Australia: Cooperative Research Centre for Contamination Assessment and Remediation of the Environment.

Cooperative Research Centre for Contamination Assessment and Remediation of the Environment. 2013b. Transparency 'key to successful clean-up'.

Cooperative Research Centre for Contamination Assessment and Remediation of the Environment. 2014a. Application Guide for Identifying and Selecting Remediation Options. Adelaide, Australia: Cooperative Research Centre for Contamination Assessment and Remediation of the Environment.

Cooperative Research Centre for Contamination Assessment and Remediation of the Environment. 2014b. Identifying and Selecting Remediation Options. Adelaide, Australia: Cooperative Research Centre for Contamination Assessment and Remediation of the Environment.

Cooperative Research Centre for Contamination Assessment and Remediation of the Environment. 2014c. Remediation and management of contaminated sites Guideline for stakeholder engagement. Adelaide, Australia: Cooperative Research Centre for Contamination Assessment and Remediation of the Environment.

Couch, S. R., and C. J. Coles. 2011. "Community stress, psychosocial hazards, and EPA decision-making in communities impacted by chronic technological disasters." American Journal of Public Health 101:S140-S148.

Cuthbertson, C., C. Newkirk, J. Ilardo, S. Loveridge, and M. Skidmore. 2016. "Angry, scared, and unsure: Mental health consequences of contaminated water in Flint, Michigan." Journal of Urban Health 93:899-908.

Deare, S. 2018. "Radioactive refinery waste site at Hunters Hill a hot topic." The Daily Telegraph, 09/03/2018. https://www.dailytelegraph.com.au/newslocal/northern-district-times/radioactive-refinery-waste-site-at-hunters-hill-a-hot-topic/news-story/da48bc46ab1bd3603312c135483e7d16.

Dulux. 2017. "Health & Safety: Lead in Paint, Technical Advice, Version 1.0." DuluxGroup (Australia) Pty Ltd. https://www.dulux.com.au/content/dam/dulux/trade/tech-advice/lead-in-paint.pdf.

EnHealth. 2012 Environmental Health Risk Assessment: Guidelines for assessing human health risks from environmental hazards. Canberra, ACT: Commonwealth of Australia.

Fletcher, C. , J. Coffey, and K. Hughes. 2009. "Community Engagement during the Rhodes Remediation Projects." Remediation Australasia 1 (14).

Focht, W., and M. Albright. 2009. Enhancing Stakeholder Acceptance of Bioremediation Technologies. USA: US Department of Energy.

Global Burden of Disease Study 2013 Collaborators. 2015. "Global, regional, and national incidence, prevalence, and years lived with disability for 301 acute and chronic diseases and injuries in 188 countries, 1990–2013: A systematic analysis for the Global Burden of Disease Study 2013." The Lancet 386 (9995):743-800. doi: https://doi.org/10.1016/S0140-6736(15)60692-4.

Government of Western Australia, and Western Australia Department of Environment and Conservation. 2011. A guideline for managing the impacts of dust and associated contaminants from land development sites, contaminated sites remediation and other related activities. Western Australia: Western Australia Department of Environment and Conservation.

Government of Western Australia, and Western Australia Department of Environment Regulation. 2014. Assessment and management of contaminated sites: Contaminated sites guidelines. Western Australia: Western Australia Department of Environment Regulation.

Government of Western Australia, and Western Australia Department of Environment Regulation. 2015. Identification, reporting and classification of contaminated sites in Western Australia: Contaminated Sites Guidelines. Western Australia: Western Australia Department of Environment Regulation.

Healey, K. 1996. Waste Management. New South Wales, Australia The Spinnery Press.

Heath, L., S. Pollard, S. Hrudey, and G. Smith. 2010. Engaging the Community: a handbook for professionals managing contaminated land. Adelaide, Australia: CRC Contamination Assessment and Remediation of the Environment.

Hoban, T. J. 1998. "Trends in consumer attitudes about agricultural biotechnology." AgBioforum 1:3-7.

Huynh, E., J. E. Araña, and J. Prior. 2018. "Evaluating residents' preferences for remediation technologies: A choice experiment approach." Science of The Total Environment 621:1012-1022. doi: https://doi.org/10.1016/j.scitotenv.2017.10.125.

Knaus, C. 2017. "WestConnex: The stink of Controversy that Fails to Go Away'." The Guardian, 07/07/2017. Accessed 07/10/2018. : https://www.theguardian.com/australia-news/2017/jul/08/westconnex-the-stink-of-controversy-that-fails-to-go-away

Kuchinskaya, O. 2013. "Twice invisible: Formal representations of radiation danger " Social Studies of Science 43 (1):78-96.

Lloyd-Smith, M. 2004. "Community Empowerment to Support Cooperative Environmentally Sound Management." Environmental Health 4 (2):39-49.

Lloyd-Smith, M., and L. Bell. 2003. "Toxic disputes and the rise of environmental justice in Australia." International Journal of Occupational and Environmental Health 9:14-23.

MacMillan, J. 2018. "Hunters Hill residents wary of latest announcement on uranium contamination." Australian Broadcasting Commission News, 21/02/2018. http://www.abc.net.au/news/2018-02-21/hunters-hill-uranium-contamination-residents-wary/9468272.

McGrath, C. 2012. "Sydney Harbour's toxic legacy shows value of green safety net " The Conversation, 17/12/2012.

McIntyre, E., J. Prior, I. L. C. Connon, J. Adams, and B. Madden. 2018. "Sociodemographic predictors of residents worry about contaminated sites." Science of The Total Environment 643:1623-1630. doi: https://doi.org/10.1016/j.scitotenv.2018.06.261.

National Environment Protection Council. 1999a. National Environment Protection (Assessment of Site Contamination) Measures 1999, Schedule 1-6, Schedules A and B. Canberra: National Environment Protection Council.

National Environment Protection Council. 1999b. National Environment Protection (Assessment of Site Contamination) Measures 1999, Schedule B(8) - Guideline on Community Consultation and Risk Communication. Canberra: National Environment Protection Council.

New South Wales Department of Environment and Conservation. 2007. Contaminated Sites: Guidelines for the Assessment and Management of Groundwater Contamination. Sydney: New South Wales Department of Environment and Conservation.

New South Wales Department of Environment, Climate Change and Water. 2010. UPSS Technical Notes: Decommissioning, Abandonment and Removal of UPSS. New South Wales: New South Wales Department of Environment, Climate Change and Water.

New South Wales Department of Health. 2004. Rhodes Peninsula small area cancer incidence and mortality study, . North Sydney NSW: NSW Department of Health.

New South Wales Environment Protection Authority. 2015. Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997. Sydney: New South Wales Environment Protection Authority.

New South Wales Environment Protection Authority. 2016a. "EPA Order Greenland to Clean Up Contaminated Site in Leichhardt." accessed 28/02/2019. https://www.epa.nsw.gov.au/news/media-releases/2016/epamedia16052602

New South Wales Environment Protection Authority. 2016b. "Independent review into off-site mercury at Orica Botany." accessed 09/04/209. http://www.epa.nsw.gov.au/working-together/community-engagement/community-news/orica-botany-bay-incident/orica-botany/independent-review-orica-botany

New South Wales Environment Protection Authority. 2018. Sydney: Olympic Park.

New South Wales Government. 1979. Environmental Planning and Assessment Act 1979 No 203. Sydney: New South Wales Parliamentary Counsel's Office.

New South Wales Government. 1997a. Contaminated Land Management Act 1979 No. 140. Sydney: New South Wales Parliamentary Counsel's Office.

New South Wales Government. 1997b. Protection of the Environment Operations Act 1997 No 156. Sydney: New South Wales Parliamentary Counsel's Office.

New South Wales Government. 1998. Managing Land Contamination: Planning Guidelines SEPP 55–Remediation of Land. Sydney: New South Wales Parliamentary Counsel's Office.

New South Wales Government. 2013. Contaminated Land Management Regulation 2013. Sydney: New South Wales Parliamentary Counsel's Office.

New South Wales Government. 2018. Contaminated Land Planning Guidelines: Draft. Sydney: New South Wales Government.

New South Wales Government Department of Planning and Infrastructure. 2013. Planning Proposal, Kolotex and Labelcraft Site, 22 & 30-40 George Street, Leichhardt. Sydney: New South Wales Department of Planning and Infrastructure.

Northern Territory Environment Protection Authority. 2013. Guidelines for Consultants Reporting on Environmental Issues. Northern Territory: Northern Territory Environment Protection Authority.

O'Rouke, J. 2017. "Historic Lead Contamination Means the Soil in three out of Four Inner West Gardens Contains Potentially Dangerous Levels of the Chemical." The Daily Telegraph, 24/01/2017. https://www.dailytelegraph.com.au/newslocal/inner-west/historic-lead-contamination-means-the-soil-in-three-out-of-four-inner-west-gardens-contains-potentially-dangerous-levels-of-the-chemical/

news-story/8a7dfc96ee7711843eec5c92136bd330

Orica. 2013. "Past community outreach projects for the Botany Groundwater Cleanup Project." accessed 07/04/2019. http://www.orica.com/Locations/Asia-Pacific/Australia/Botany/Botany-Transformation-Projects/Groundwater-Cleanup/overview-of-the-botany-groundwater-cleanup-project#.WeVPAROCwUs.

Orica. 2017. "Botany Remediation Projects: Community." accessed 09/04/2019. http://www.orica.com/Locations/Asia-Pacific/Australia/Botany/Community#.WeVP7ROCwUs

Page, J., and J. Atkinson-Grosjean. 2013. "Mines and microbes: public responses to biological treatment of toxic discharge." Society and Natural Resources 26:270-284.

Parsons Brinckerhoff, and New South Wales Government State Property Authority. 2012. Remediation of former Radium Hill Company site Nelson Parade Hunters Hill environmental assessment. Sydney NSW: Parsons Brinckerhoff Australia Pty Limited.

Peatling, S. 2004. "Contested bay clean-up may take 30 years." Sydney Morning Herald, 17/11/2004.

Peters, E., P. Slovic, J. H. Hibbard, and M. Tusler. 2006. "Why worry? Worry, risk perceptions, and willingness to act to reduce medical errors." Health Psychology 25:144-152.

Prior, J, and E Partridge. 2010. Technical Report No.17: The Australian experience: A comparative analysis of the effects of contamination and its remediation on individuals and communities at two Australian sites. Adelaide: Cooperative Research Centre for Contamination Assessment and Remediation of the Environment.

Prior, J., and E. Partridge. 2009. Experiencing the toxic city: Effects of contamination and its remediation on individuals and communities in Urban Australia. Sydney: Institute for Sustainable Futures, University of Technology Sydney.

Prior, J., E. Partridge, and R. Plant. 2014. "'We get the most information from the sources we trust least': residents' perceptions of risk communication on industrial contamination." Australasian Journal of Environmental Management 21 (4):346-358. doi: 10.1080/14486563.2014.954011.

Prior, J. 2016. "The norms, rules and motivational values driving sustainable remediation of contaminated environments: A study of implementation." Science of The Total Environment 544:824-836. doi: https://doi.org/10.1016/j.scitotenv.2015.11.045.

Prior, J. 2018. "Factors influencing residents' acceptance (support) of remediation technologies." Science of The Total Environment 624:1369-1386. doi: https://doi.org/10.1016/j.scitotenv.2017.12.133.

Prior, J., A. Gorman-Murray, E. McIntyre, I. Connon, J. Adams, and B. Madden. 2019. "A geography of residents' worry about the disruptive effects of contaminated sites." Geographical Research 57 (1):52-66. doi: 10.1111/1745-5871.12312.

Prior, J., P. Hubbard, and T. Rai. 2017. "Using residents' worries about technology as a way of resolving environmental remediation dilemmas." Science of The Total Environment 580:882-899. doi: https://doi.org/10.1016/j.scitotenv.2016.12.035.

Prior, J., and Tapan R. 2017. "Engaging with residents' perceived risks and benefits about technologies as a way of resolving remediation dilemmas." Science of The Total Environment 601-602:1649-1669. doi: https://doi.org/10.1016/j.scitotenv.2017.05.187.

Rae, I., and P. Brown. 2008. "Managing the intractable: communicative structures for hexachlorobenzene and other scheduled wastes." Journal of Environmental Management 90 (4):1583-1592.

Rouillon, M., L. Kristensen, M. P. Taylor, P. Harvey, and S. G. George. 2017. "Elevated Lead Levels in Sydney Back Yards: Here's What you Can Do." The Conversation, 17/01/2017

Scully, J. L. 2013. "Disability and vulnerability: on bodies, dependence, and power." In Vulnerability: New Essays in Ethics and Feminist Philosophy, edited by C. Mackenzie, W. Rogers and S. Dodds. USA: OUP.

Short, J. R. 2015. "The green and the gold: Can we soften the environmental impact of the Olympics? ." The Conversation, 04/06/2015.

South Australia Environment Protection Authority. 2008. EPA Guidelines for Environmental management of on-site remediation. South Australia: South Australia Environment Protection Authority.

South Australia Environment Protection Authority. 2015. Stakeholder engagement delivery framework (Site contamination). South Australia: South Australia Government.

Stapleton, D. 2017. "From Toxic Dump to Hotspot: Rhodes, The Sydney Suburb that's Risen from the Dead." Last Modified 22/03/2017,

accessed 14/05/2019. https://www.domain.com.au/news/from-toxic-dump-to-hotspot-rhodes-the-sydney-suburb-that8217s-risen-from-the-dead-20170322-gv3bw0/.

State of New South Wales, and New South Wales Office of Environment and Heritage. 2011. Guidelines for consultants reporting on contaminated sites. Sydney: New South Wales Office of Environment and Heritage.

Sustainable Remediation Forum Australia, Cooperative Research Centre for Contamination Assessment and Remediation of the Environment, and Australasian Land and Groundwater Association. 2011. A Framework for Assessing the Sustainability of Soil and Groundwater Remediation. Sustainable Remediation Forum Australia.

Swane, I. C. 2001. "Homebush Bay Dioxin Remediation Project." Australian Geomechanics:25-42.

Sydney Harbour Federation Trust. 2009. "HMAS Platypus Comprehensive Plan Amendment." Australian Government Sydney Harbour Federation Trust, accessed 28/02/2019. http://www.harbourtrust.gov.au/planning-projects/strategic-plans#comprehensive_plan.

Sydney Harbour Federation Trust. 2016. "Platypus - Management Plan." Australian Government: Sydney Harbour Federation Trust, accessed 28/02/2019 http://www.harbourtrust.gov.au/planning-projects/public-consultation/platypus-management-plan

Takebayashi, Y., Y. Lyamzina, Y. Suzuki, and M. Murakami. 2017. "Risk perception and anxiety regarding radiation after the 2011 Fukushima nuclear power plant accident: A systematic qualitative review." International Journal of Environmental Research and Public Health 14:1306.

Terwel, B. W., and D. D. L. Daamen. 2012. "Initial public reactions to carbon capture and storage (CCS): differentiating general and local views." Climate Policy 12:288-300.

Tonin, S., and M. Turvani. 2013. "Redeveloping industrial land: are contamination and remediation schemes affecting the price of industrial real estate properties? ." Journal of Environmental Planning Management 57:1043-1065.

Tütem, E., and R. Apak. 1995. The Role of Metal-Ligand Complexation Equilibria in the Retention and Mobilization of Heavy Metals in Soil. Dordrecht, Netherlands Springer.

United States Environmental Protection Agency. 2007. Risk communication in action: the risk communication workbook, EPA/625/R-05/003. Washington, DC, USA: National Research Programs, United States Environmental Protection Agency, .

Victorian Environment Protection Authority, and WorkSafe Victoria. 2017. Industry standard: Contaminated construction sites. Victoria: Victorian Environment Protection Authority, .

Wallace, P. 2014. "Returning Sydney site to the people." Waste Management and Environment 25 (6):33.

Wallquist, L., V. H. M. Visschers, and M. Siegrist. 2009. "Lay concepts on CCS deployment in Switzerland based on qualitative interviews." International Journal of Greenhouse Gas Control 3:652-657.

Walsh, M., S. Cormier, K. Varner, and B. Dellinger. 2010. By-products of the Thermal Treatment

of Hazardous Waste: Formation and Health Effects. Pittsburgh: EM.

Wiesel, Ilan. 2009. "Community and the geography of people with intellectual disability." Social and Cultural Geography 10 (5):599-613

Yao, Z., J. Li, H. Xie, and C. Yu. 2012. "Review on Remediation Technologies of Soil Contaminated by Heavy Metals." Procedia Environmental Sciences 16:722-729

Zlomke, K. R., and J. S. Hahn. 2010. "Cognitive emotion regulation strategies: gender differences and associations to worry." Personality and Individual Differences 48:408-413.