

## Phase I, II and III Site Contamination Assessments

### PHASE ONE ASSESSMENTS (PRELIMINARY SITE ASSESSMENTS)

Phase I Assessments are designed to determine whether or not the potential for contamination exists on a site. Site contamination could arise due to industrial processes, introduced soil or fill, use of hazardous chemical or substance use, persistent chemicals such as pesticides and heavy metals, fuel storage, inappropriate waste disposal, excavation or mining activities or migration from neighbouring activities

As many contaminants are persistent in the soil and groundwater for long periods of time, historic activities or events require investigation along with more recent site activities.

As a minimum, Phase I Assessments should include the following issues:

- Site identification – property address, property description, title reference, local government authority, zoning, current owner, current occupant, current land use and proposed land use;
- Site chronology – land ownership, development of site buildings and infrastructure. Processes and equipment, chemicals and hazardous materials, fuel storage, inputs, by-products and waste, soil cover, fill and excavation;
- Neighbouring setting and chronology – historical title and occupancy searches and record from local authorities; and
- Interviews with Employees, preferably long serving employees.

In addition to these other signs of potential contamination should be identified:

- Signs of stressed vegetation or no vegetation;
- Property conditions or activities which could potentially cause soil or groundwater contamination;
- Presence of surface and subsurface storage tanks, drums and other containers, in use and abandoned;
- Onsite waste water systems in use or abandoned;
- Electrical equipment that may contain PCBs; and
- Building materials that may contain asbestos.

Where there is potential for contamination from neighbouring activities such as service stations or land filling activities, these should also be noted.

If, during the Phase I Assessment, it is determined that potential for contamination does exist, then a Phase II Assessment is generally necessary to confirm the presence or otherwise of contamination.

### Outcome:

- A report confirming whether potential exists for the site to be contaminated.

The report should provide the rationale for determinations including; details on the investigative approach, interviewed personnel including Authorities, records and land title searches, extent and coverage of site inspection.

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- If contamination is suspected, a sampling and analysis plan identifying potential pollutants, their location, the number of samples recommended to confirm or otherwise the contaminants presence is necessary within the report.

### **PHASE II ASSESSMENTS**

Phase II Assessments are designed to collect information to confirm or otherwise whether contamination is present on the site at 'hot spot' locations.

Whether or not a Phase II Assessment is required depends on the nature of the property under investigation, the quantity and quality of information gathered during the Phase I Assessment, and the strength of the evidence that hazardous or toxic substances were or are located on the property.

Phase II Assessments involve undertaking intrusive sampling and analysis in order to confirm or otherwise the presence of contamination at potential hot-spot locations or in accordance with the sampling guidelines provided in the Australian Standard, EPA Guidelines or NEPM specifications depending on the type and complexity of contamination (eg in accordance with AS 4482.1:1997). It may require a groundwater quality assessment. If contamination is not identified, it is unlikely to represent a significant risk and generally warrants no further investigation.

The components to the Phase II Assessment include:

- Review of Sampling and Analysis Plan;
- Preparing for the site visit;
- Conducting the sampling;
- Analysing the samples;
- Interpreting analytical results given intended land-use of the site; and
- Reporting and making further recommendations as required for delineation of any areas of concern ie progressing to a Phase III Assessment.

### **Outcome:**

- A detailed report outlining sampling and analysis investigation methods, results, and quality assurance considerations.
- The report should identify contaminants in excess of the guidelines for the existing and intended use of the property. Guidelines used should be referenced.
- If contaminants exceed investigation threshold limits, further investigation is generally required. The report should therefore specify a Phase III Sampling and Analysis Plan.

### **PHASE III ASSESSMENTS**

Phase III assessments are designed to quantify the extent and/or significance of contamination and the need from remediation and/or management strategies. These usually involve extended sampling and analysis program, preferentially performed on a basis that will permit statistical interpretation of results, thereby permitting a risk evaluation of the site. It will also include an appraisal of groundwater quality and off-site impact.

Phase III Assessments develop, prioritise and provide a cost estimate for one or more remedial / management alternatives to address contamination on and/or beyond a property.

### **Outcome:**

- A report detailing a statistically reliable set of analytical results as compared with recognised standards.

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- A groundwater/ hydro-geological assessment.
- A pathway appraisal for off-site impact.
- A list of options to address the contamination identified including a recommended remediation/ management strategy.
- A recommendation for detailed migration assessment including groundwater contamination mapping if not investigated during the Phase III survey.

An indication of likely costs associated with investigations is provided below:

**Table 1: Typical Time & Cost Allocations associated with Investigations.**

<i>Type of assessment</i>	<i>Timing</i>	<i>Estimated costs (excluding expenses)</i>
Phase I or preliminary site assessment	Small sites - 1 day per site with Medium to large sites - up to three to five days per site  Additional days may be required for liaison with local authorities, historical aerial photograph reviews and title searches.	\$1,800 - \$3000 \$5,000- \$9,500
Phase II assessments	Mobility and availability of consultants, drilling rigs and laboratories will dictate the final timetable, but typically even small sites will require up to 3-6 weeks	Depending on the scope of the assessment and the size of the site, can typically range anywhere between \$1,000 and \$50,000 for small to medium sites. Larger sites can be more expensive.
Phase III assessments	Detailed evaluations possibly including risk assessment may require several months to complete.	Again, depending on the scope of the assessment and the size of the site, can typically range anywhere from \$10,000 to beyond \$100,000 if groundwater is impacted.

A summary of management considerations is attached in Annex 1.

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***Annex 1: Key Principles Arising from Contaminated Site Legislation (Australia)***

<b>Situation</b>	<b>Legislative Impact</b>	<b>Principle</b>
<b>SITE OWNED &amp; OPERATED</b>	<i>Polluter Pays. Owner Liability. Due Diligence Considerations.</i>	Existing and historic contamination liability requires identification and management.  An inventory of risk sites should be retained on a database to evidence effective risk management and provide for a reasonable time frame for action aligned with Client priorities.
<b>SITE OWNED BUT CONSIDERED FOR SALE</b>	<i>Polluter Pays. Disclosure Requirements.</i>	Ensure the contamination status of the site is well documented and remediation to appropriate level is done to avoid clean up liabilities at a future date if identified as the polluter.
<b>SITE OWNED BUT CONSIDERED FOR LEASE</b>	<i>Owners Liability.</i>	Ensure lease conditions carefully define permitted use, require a bond where warranted and require rectification of any pollution.  Ensure occupiers are regularly audited to confirm status of contamination. If pollution is identified confirm occupier as the polluter.
<b>SITE CONSIDERED FOR PURCHASE</b>	<i>Innocent owners may become liable for contamination.</i>	A detailed site contamination investigation should be requested from Vendor prior to any purchase of Industrial & Commercial property.
<b>LEASEHOLD SITE</b>	<i>Potential Polluters may become liable for contamination.</i>	Ensure status of site is well documented prior to leasing to avoid wrongful blame for contamination.  Control operations to ensure no potential for pollution.