Contaminated land and UPSS

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Housekeeping

- In case of emergency...
- Facilities
- Breaks
- Mobile phones / emails
- Questions and stories

"I hear and I forget. I see and I remember. I do and I understand." *Confucius*

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"The only stupid questions are the ones not asked." Jason Scarborough



Introductions

- Share with the group:
 - Your name
 - Your workplace
 - One thing you are hoping to get out of the training
 - A memory anchor / conversation starter...





Outcomes

- Recall the Contaminated Land Management framework.
- Identify the key components of an Underground Petroleum Storage System (UPSS).

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- Identify where leaks can occur in an UPSS.
- Recall the key requirements of the UPSS Regulation.
- Undertake UPSS inspection and monitoring:
 - Examine fuel system operation plans,
 - Undertake risk assessments, and
 - Apply risk-based regulation.
- Apply decommissioning requirements for UPSS.

Course outline

- Session 1
 - The why and how
- Session 2
 - Requirements of the UPSS Regulation (Part 1)
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- Field visit





Session 1

The why and how







The first contaminated site?



Wadi Faynan, Jordan

- Copper forging and smelting that started about 7,000 years ago.
- Copper, lead, zinc, cadmium, arsenic, mercury and thallium contamination resulted.
- Bioaccumulated contaminants over thousands of years believed to have led to widespread health problems in ancient populations.



A brief history

- Land contamination is not a "new" thing.
- Contaminating human activities began from around 5,000 BCE.
- Land contamination picked up pace during the industrial revolution.
- 1950's onwards:
 - increased concern about the environment.
 - increased awareness of impacts on human health.
- Science still developing today.









Martin Street, Armidale





Martin Street, Armidale



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- CCA and creosote timber treatment.
- Ordinary operation:
 - Poor maintenance,
 - Lots of spills,
 - On-site waste disposal,
 - Odour issues.
- "After rain, a creosote scum is observed on the surface of the ground."
- Redeveloped as residential land in 1987.



Martin Street, Armidale

- Investigation concluded that the site was highly contaminated with levels far in excess of those considered safe for human health.
- Resident's blood showed the presence of copper, chromium, DDT and arsenic.
- Health effects reported included severe contact dermatitis, respiratory problems, nosebleeds, diarrhea, and behavioural disturbances in children.
- 25 owners bought out by Federal Government in 1993 (\$4.5M).
- Council and consultant sued by developer and awarded \$1.5M.
- Purchased from the Commonwealth in 2003 for \$2.17M.
- STILL on the contaminated lands register.



The "Why" - Implications of contaminated land

- Impacts on the health and wellbeing of people.
- Impacts on the environment.
- Limits land use.
- Complicates planning and development assessment.
- Increases development costs and risks.
- Significant social cost

Every Council area has at least one contaminated site...



Underground Petroleum Storage Systems



What is a UPSS?

- A system of underground tanks and associated pipes, valves and other equipment, that is designed to contain and control the passage of petroleum.
- Petroleum includes products like:
 - regular and premium petrol
 - E10
 - Diesel
 - waste oil
 - Heating oil (as of 1 September 2021)





What is a UPSS?

- It does not include:
 - a sump, separator, stormwater or wastewater collection system, catchment basin, pit, septic tank or other like structure (unless petroleum routinely passes through the structure from one part of a storage system to another),
 - a bunded tank situated below ground level but not in the ground (such as in a basement, cellar or tunnel),
 - a liquefied petroleum gas storage system,
 - Piping associated with vents or vapour recovery.



Why are UPSS significant?

- They store and transfer dangerous chemicals (petroleum hydrocarbons, ethanol, lead).
- They can contaminate soil, surface water, groundwater, and air.
- The contaminants can be highly mobile.
- They can be an explosion hazard with the migration of flammable vapours.
- There are around 3,000 of them in NSW.
- They are over-represented as regulated sites under the CLM Act.











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The "How" - Legislation

- Contaminated Land Management Act 1997 (CLM Act)
- Environmental Planning and Assessment Act 1979 (EP&A Act)
- State Environmental Planning Policy No. 55 (SEPP 55)
- Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2019 (UPSS Regulation)



CLM Act

- Administered by NSW EPA.
- Only applies to land declared "significantly contaminated".
- Key objectives:
 - set out the accountabilities for managing significantly contaminated land,
 - set out the role of the EPA,
 - to provide for the accreditation of site auditors of contaminated
 - to ensure that contaminated land is managed with regard to the principles of ecologically sustainable development.
- Also contains an obligation to report contamination.

CLM Act - responsibilities





EP&A Act

- Administered by planning authorities (including Local Councils).
- Typically triggered when a change in land use is proposed (rezoning application, development application, DA modification, Part 5).
- Planning authorities MUST consider actual or potential land contamination.
- Section 10.7 certificates (old s.149 certificates).
- Applicant's responsibility to investigate, remediate and validate, but good practice for planning authorities to advise developers of suspected/ known contamination.



SEPP 55

- Administered by planning authorities (including Local Councils).
- State-wide approach to the remediation of contaminated land. It:
 - specifies when consent is required, and when it is not required, for a remediation work, and
 - specifies certain considerations that are relevant determining development applications to carry out a remediation work, and
 - requires that a remediation work meet certain standards and notification requirements.



SEPP 55

- Two categories or remediation work:
 - Category 1 requires consent. Typically large scale or will occur in an environmentally sensitive area.
 - Category 2 does not require consent. Typically smaller scale remediation in less environmentally sensitive areas.



UPSS Regulation

- Since 1 September 2019, administered by Local Councils, unless:
 - operated by public authorities,
 - in the unincorporated areas of NSW,
 - subject to an environment protection licence, or
 - subject to a notice, direction or requirement made, issued or given by the EPA before 1 September 2019.



UPSS protection model





POEO Act

- Chapter 7 (Investigation) powers available for use.
- Regulatory actions also available:
 - pollution incidents clean-up notice.
 - activities undertaken in an "environmentally unsatisfactory manner" prevention notice.
 - alleged offences penalty notices or prosecution.



Regulatory model





Discussion and Questions



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Session 2

Requirements of the UPSS Regulation (Part 1)







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Competent design and construction

- Design and construction must be by "duly qualified person".
- A person who has competence and experience in relation to that activity that is:
 - recognised by a peak body in the relevant industry as appropriate for that activity, or
 - recognised generally in the relevant industry as appropriate for that activity.
- The Australasian Convenience and Petroleum Marketers Association (ACAPMA) have a Duly Qualified Person Program.
- Australasian Institute of Dangerous Goods Consultants (AIDGC) is another peak body.



Competent design and construction



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- AS 4897-2008: The design, installation and operation of underground petroleum storage systems.
- Key requirements:
 - non-corrodible tanks and piping
 - secondary containment of tanks and piping
 - overfill protection devices
 - leak detection for tanks and piping.









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- Two types:
 - Groundwater monitoring Preferred by the EPA. Every well must be checked
 / tested at least every 6 months
 - "Alternative" Where groundwater monitoring wells are not effective or suitable.
- Most appropriate system to be recommended, designed and installed by a duly qualified person.









Source: NSW EPA







Source: Envirotank (Aust) Pty Ltd

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A word of caution...







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Loss monitoring systems



• Three types:

- Manual wet stock reconciliation for manual dipping.
- Automated inventory reconciliation for automated tank gauging.
- Statistical Inventory analysis Best practice. Continual statistical analysis of outgoings and incomings. Can be used for both manual dipping and automated tank gauging.



Manual dipping



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Automated tank gauging



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Statistical inventory analysis



LEIGHTON O'BRIEN











Loss monitoring system

• Must be designed by a duly qualified person.



- Upon coming aware of a discrepancy, within 60 days:
 - investigate the discrepancy,
 - if the discrepancy cannot be attributed to anything other than a leak, to confirm the existence of a leak, and
 - identify source of leak and stop it.

Next session...





Discussion and Questions



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Session 3

Requirements of the UPSS Regulation (Part 2)







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Equipment Integrity Testing (EIT)







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Equipment Integrity Testing (EIT)

- Measures the containment integrity of the tanks, fittings and pipes.
- Uses a variety of different or integrated methods.
- Minimum EIT requirements:
 - be capable of detecting a leak of 0.38 litres per hour,
 - be conducted by a duly qualified person,
 - use a nationally approved and certified method.



Equipment Integrity Testing (EIT)

- An EIT **MUST** be undertaken when a:
 - new UPSS is commissioned,
 - UPSS is modified,
 - tank in the UPSS is reused, and/or
 - UPSS is repaired.
- Certification of a successful test must be provided before the commissioning / recommissioning.





Fuel Systems Operation Plan (FSOP)

- Describes describing how the UPSS site is configured, managed, and maintained.
- Required for all UPSS old and new.
- Can be hard copy or electronic.
- Must be accessible to all staff and contractors (and Authorised Officers).
- May be incorporated into a broader site management document.







What a FSOP must contain (Big 7)

- 1. 24 hour contact for person responsible for UPSS.
- 2. Name of the person who owns the UPSS site (if different from the responsible person).
- 3. Incident management procedure(s) dealing with leaks and spills.
- 4. Details of the loss monitoring system.
- 5. A maintenance schedule / details.
- 6. Records of staff site induction and incident management training.
- 7. Current "as built" drawings.



Site plans vs "as built"









Record keeping and reporting

- Records required to be kept for 7 years after created / after the date of decommissioning:
 - Incident log
 - Removal / replacement of any tank
 - Significant modifications to the UPSS
 - Equipment integrity tests
 - Data from measuring instruments
 - Loss investigation actions
 - Reports of pollution incidents
 - Decommissioning of the UPSS
Reports required to be provided to Council

- Decommissioning of a UPSS
 - Notification 30 days before or as soon as reasonably practicable
 - Report 60 days after
- Removal or replacement of any tank
 - Report 60 days after
- Reports must:
 - be prepared by a duly qualified person
 - describe the process used
 - detail assessment of contamination / any remediation

Decommissioning a UPSS

- A UPSS or tank is deemed to be abandoned when:
 - it has not been used to store fuel for two or more years, or
 - where it is not intended to be used to store fuel again.
- Abandoned UPSS / tanks must be decommissioned appropriately.





Decommissioning a UPSS









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Exemptions

• Clause 29(1) of the UPSS Regulation:

"The appropriate regulatory authority may, by order in writing, exempt a person or a class of persons specified in the order from any provision of this Regulation specified in the order to the extent that the provision applies to the person or class in respect of any storage system specified in the order."

• Tempting... but don't be tempted.







Discussion and Questions



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Session 4

Undertaking an inspection







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UPSS regulation in rural and regional NSW

- UPSS inspection / regulation will require some finesse.
- Need to simultaneously:
 - determine compliance with regulatory standards.
 - assess the potential / actual risks to human health and the environment.
 - consider social needs.
 - encourage compliance.
 - provide information.
 - be fair and credible.













Inspection process



Planning

- WHS!!!
 - Flammable environment
 - Vehicle movements (including heavy vehicles)
 - Confined spaces
- Desktop assessment?
- What is the purpose / what information do you need?
- Are we providing prior notification?
- What equipment do you need?



Intrinsically safe equipment









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Intrinsically safe equipment

Europe	Europe	USA	USA	Canada	Brazil
IECEX	EU (ATEX)	FM Approval	UL	CSA	INMETRO
IEC	(Ex)	FM	CULUS		INMETRO

Russia	Australia	China	Korea	Japan
GOST-R	ANZEX	NEPSI	KCs	TIIS
PG	ANZEx	Ex NEPSI	€ s	TIIS

WHS Planning Preparation Execution Closure / Follow-up Document

Preparation

- JSAs / Take 5 / PPE.
- Plan logistics and allocate tasks.
- Checklist (if applicable).
- Necessary equipment, notebook (and pens!).
- Copies of applicable regulatory instruments / guides.
- Call in / comms procedures.
- Site contact name.





Execution

- Are you appropriately delegated / authorised?
- You only get one chance to make a first impression.
- That impression may be lasting... and impact on anyone that follows.
- A great example of a bad example...



"Raptor 13"



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- Senior Constable Andrew Murphy
 - "A no-nonsense cop"
 - "Tough talking, tough acting"
 - "Rough and tumble policing"
 - "Hard-line policing"
 - "Not afraid to use the full force of the law"



"Raptor 13" in action





Execution

- Introduce yourself as a human being.
- Involve site personnel in the inspection.
- Communicate openly. Ask if they have questions.
- Remember your powers... and what you should do.
- Record your observations.
- Remember WHS! Things can change quickly.

It is possible to be firm, respectful, professional and friendly.



Execution – Key things to look for

- Age of UPSS (i.e. is it "new" or "old". Also >20 years old = danger zone)
- Fuel System Operations Plan (FSOP) remember the FSOP Big 7:
- 1. 24 hour contact for person responsible for UPSS.
- 2. Name of the person who owns the UPSS site (if different from the responsible person).
- 3. Incident management procedure(s) dealing with leaks and spills.
- 4. Details of the loss monitoring system.
- 5. A maintenance schedule / details.
- 6. Records of staff site induction and incident management training.
- 7. Current "as built" drawings.





Closure / follow-up

- Have a debrief with operator:
 - Identify any issues / gaps.
 - Ask if there are any plans to upgrade in the near future.
 - Discuss what can be done (if anything) short term.
 - Advise that you will write with the outcomes of the inspection and advise of next steps.
 - Ask them if they have any questions.
 - Thank them for their time.

Document

- Make a record of your inspection!
- Include (at least):
 - Date, time, location,
 - Who was present,
 - What was examined (include any photographs),
 - Details of relevant discussions, and
 - Outcomes and recommendations.









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