South Australia's Environment Protection Authority

Beverley assessment area update

Community Working Group

Tuesday 25 July 2017

EPA South Australia

Overview

- Background
- Update on Stage 4A (broader works) – Completed (awaiting final report)
- Update on Stage 4B (site specific works) –
  - 1st sampling event (autumn) completed (April/May)
  - 2nd sampling event (winter) commencing next week
- Update on mitigation properties
- Community engagement update
- Thank you and questions

Background

Multiple objectives across three stages of work:

- Delineation of plume(s) ongoing
- Source(s) identification – new source potentially discovered
- Sub-surface characterisation
- Preferential pathways analysed
- Updating the health risk assessment (still being finalised)
- Site specific works to do ongoing monitoring for properties
- Mitigation trial at two properties successful

Stage 4A outcomes

- Groundwater and soil vapour concentrations have generally decreased over the past 12 months
- Soils are wetter than they were during the last monitoring events
- Groundwater depth has risen between 2016 and 2017
- Predominantly clay soils have been discovered with distinct sandy lenses in some areas
- We have had confirmation of some source locations and some sources include other chemical substances

Stage 4A outcomes

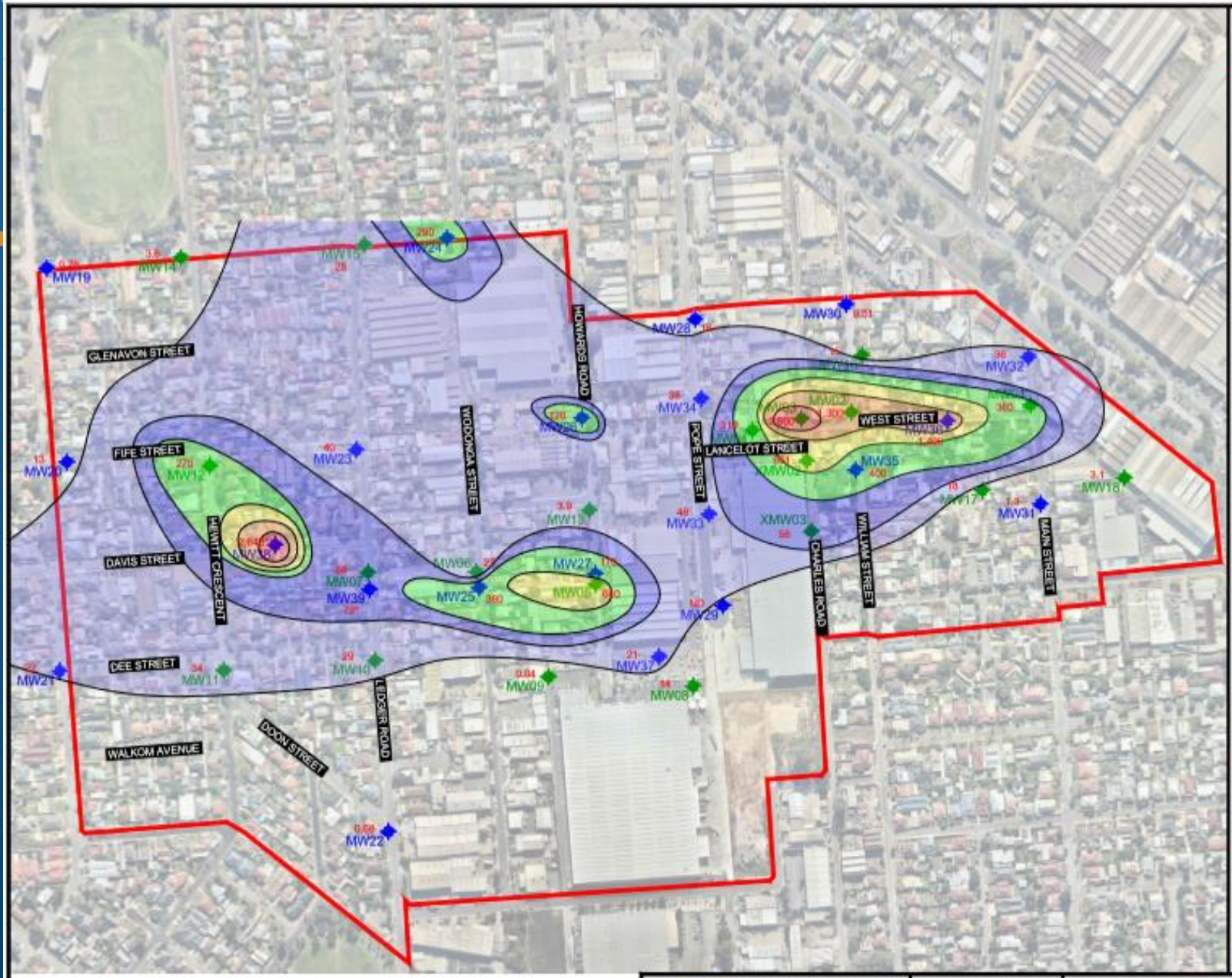
- Further delineation of plume(s) has been largely achieved, although still not quite delineated to NW/W for groundwater and soil vapour
- One source has been confirmed between Pope Street and Howards Rd (current Toro site)
- New source(s) have been identified:
  1. NW assessment area
  2. Pope Ct (petroleum source)
  3. Pug hole to SW

Stage 4A outcomes

- One source - William and West Streets (MIP data was not overly conclusive as to the precise location of the source)
- Groundwater wells were installed deeper with a longer screen to:
  - better capture any fluctuations in the groundwater depth
  - consider areas where clay layers exist for a potential dense non-aqueous phase liquid (DNAPL) - contaminant that's heavier than the groundwater and sits at bottom of aquifer. The testing appears to confirm that this doesn't exist.

Stage 4A outcomes

- Further sub-surface characterisation undertaken, which determined that the soil profile largely consists of clay to heavy clay with some sandy lenses
- Naturally occurring preferential pathways were confirmed
- In some locations the MIP results showed sandy lenses are evident at around 4 metres below ground level and 6 metres below ground level. This is important as soil vapour moves more easily through sand.



LEGEND

- EPA ASSESSMENT AREA
- EXISTING MONITORING WELL
- NEW MONITORING WELL
- 360 TCE CONCENTRATION (µg/L)
- ND NON-DETECT
- * RESULT FROM JULY 2017 SAMPLING

2800
1000
500
100
50
25
ND

TCE CONCENTRATION (µg/L)

N

NOTE: ALL LOCATIONS ARE APPROXIMATE.
DIMENSIONS IN METRES (m)

0 40 80 120 160 200
SCALE 1:4000 (A3) METRES

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PROJECT:	20174337.001A
DATE DRAWN:	31.05.17
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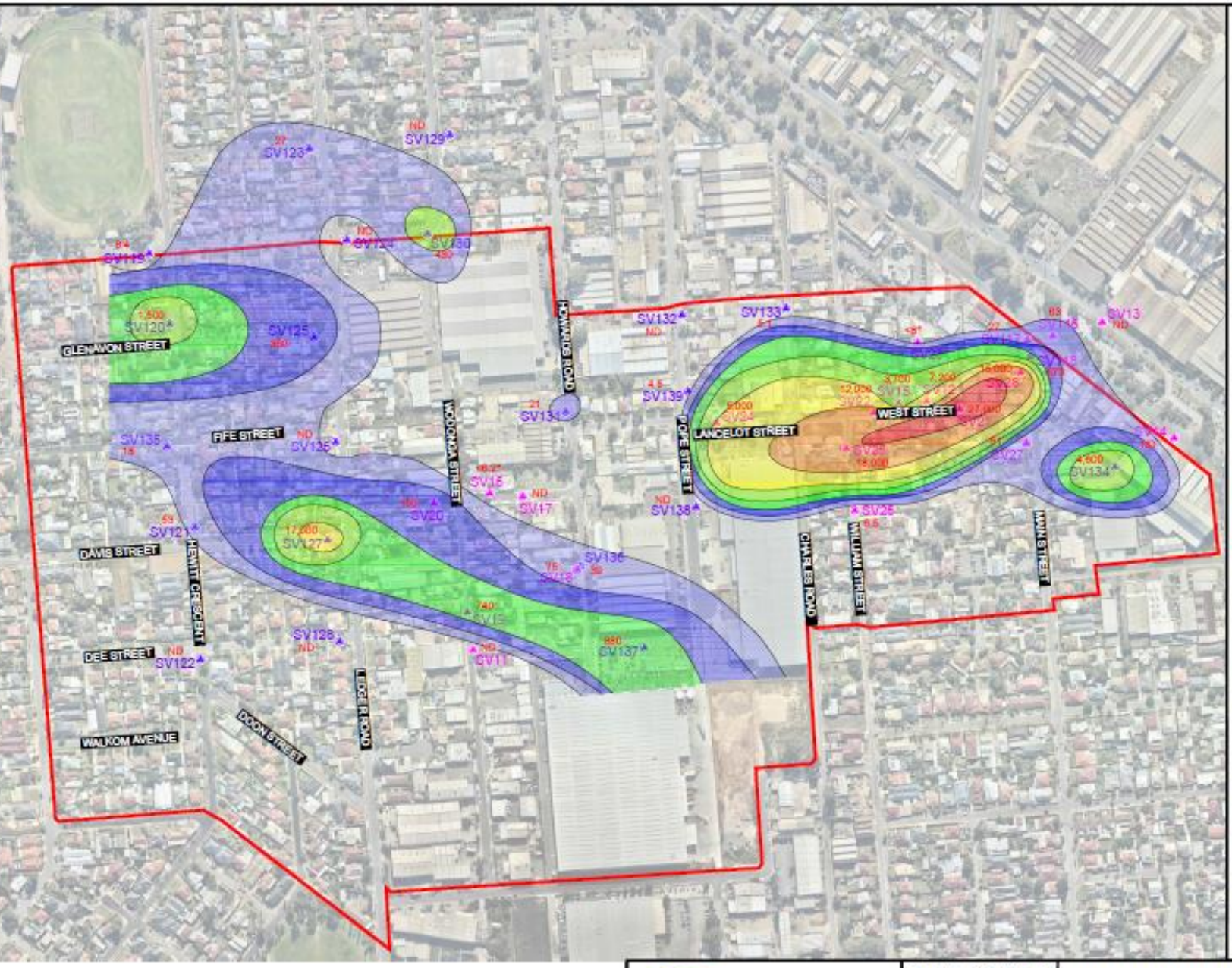
FILE NAME:	20174337.001A.dwg

INFERRED DISSOLVED PHASE TCE GROUNDWATER PLUME (MAY 2017)

EPA BEVERLEY ASSESSMENT AREA
STAGE 4A ENVIRONMENTAL ASSESSMENT

BEVERLEY, SOUTH AUSTRALIA

FIGURE
6B



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INFERRED TCE SOIL VAPOUR PLUME 1m CONCENTRATIONS (MAY 2017)

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STAGE 4A ENVIRONMENTAL ASSESSMENT

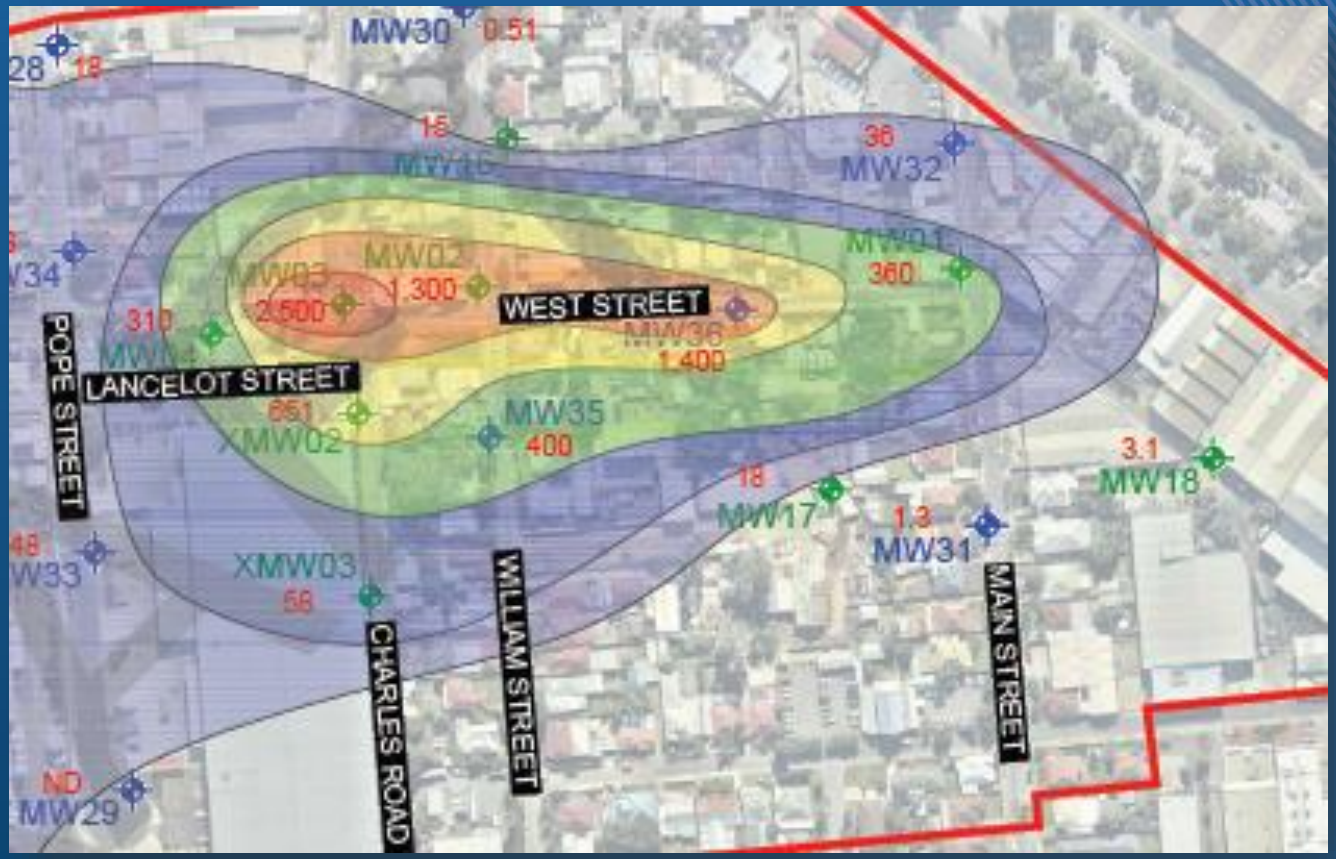
BEVERLEY, SOUTH AUSTRALIA

FIGURE **7B**

Source sites

https://www.youtube.com/watch?v=-xJ4u9YtDDo

West St / William St source



Toro site source

Pug hole source (not chlorinated hydrocarbons)

Old tank (waste oil source) – petroleum hydrocarbons

Sub-surface characterisation

The MIP instrument has five outputs in one:

- Photo-ionisation detector/flame ionisation detector (PID/FID) – used for detection of volatile organic compounds (primarily for petroleum hydrocarbons)
- Halogen specific detector (XSD) – used for detection of chlorinated hydrocarbons

Sub-surface characterisation

- Electrical conductivity (EC) – used for gathering information about the sub-surface profile
- Hydraulic profiling tool (HPT) - used for gathering information about the sub-surface profile

Sub-surface characterisation

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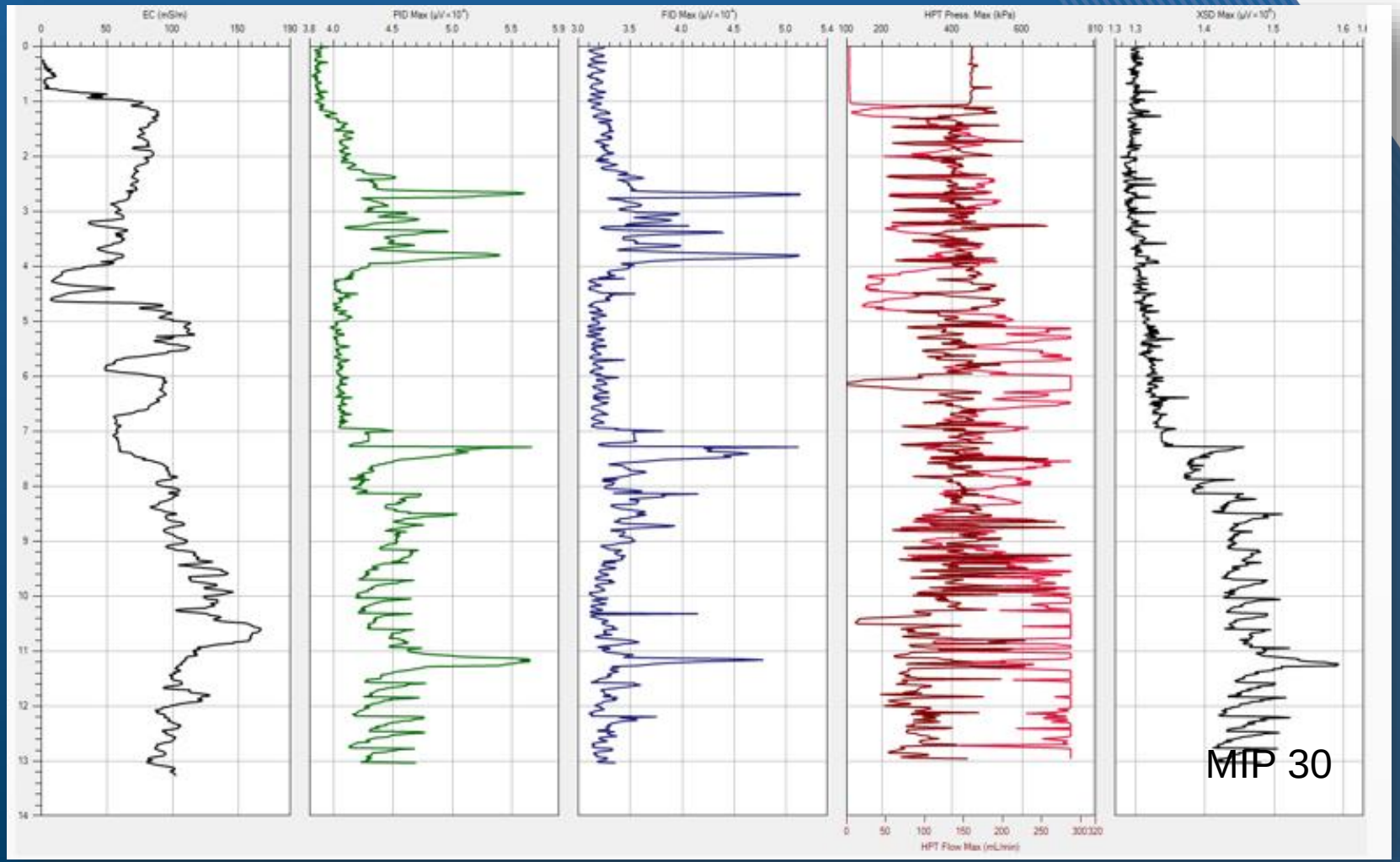
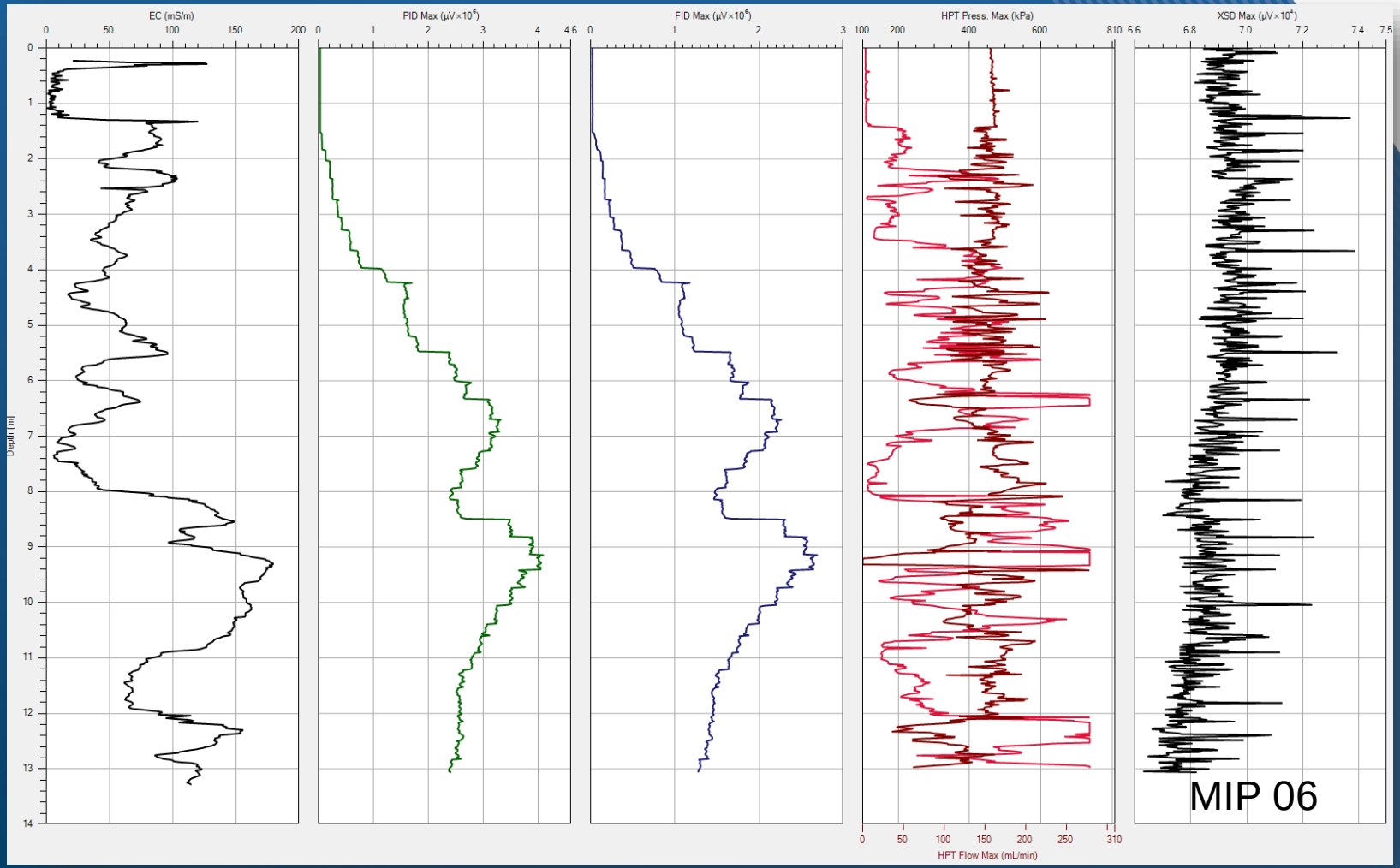
Sub-surface characterisation



Sub-surface characterisation



Stage 4B - monitoring continuing

- Site specific works:
  1. Soil vapour sampling
  2. Crawlspace/sub-slab sampling
  3. Indoor air sampling

Stage 4B - monitoring continuing

- 16 properties were sampled
  - 14 residential
  - 2 commercial

- Varying sampling was undertaken at each property
  - 2 soil vapour bores (incl. 1 commercial)
  - 3 crawl spaces were sampled
  - 1 sub slab was sampled
  - 9 soil vapour, crawl space and indoor air samples were taken
  - 1 indoor air sampling was undertaken (commercial)

Stage 4B - results

Indoor air level response range (TCE)

- 1 x no action (safe)
- 3 x validation (safe)
- 10 x investigation (no immediate concerns, further assessment)
- 2 x intervention* (may be a health risk, immediately look at next steps and further assessment)

**Both properties in the intervention range were predicted from crawlspace data that assumes a 1:1 ratio (ie the same concentrations under the floor as in indoor air, which is not usual). Indoor air sampling will therefore be undertaken as part of the second monitoring event*

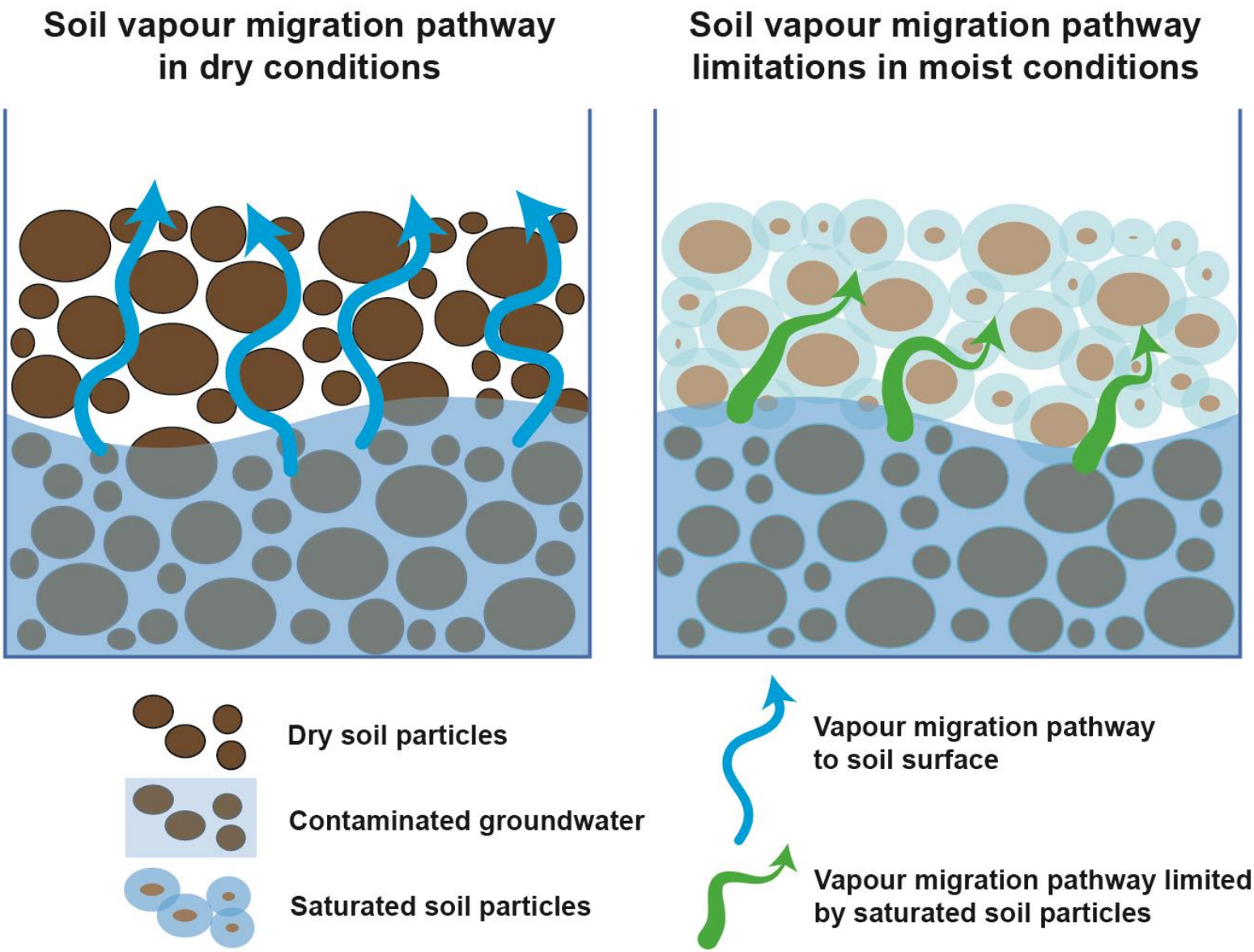
Soil vapour migration

Vapour Intrusion More Likely

Vapour Intrusion Less Likely

Chemistry	Weather	Geology	Hydrology	Building	Biology
High Concentra-tions in soil, groundwater & soil vapour	Heating season Strong winds	Sandier soils Fractures Dry soils Preferential pathways (natural or artificial)	Shallow groundwater Groundwater depth fluctuation	No concrete slab (barrier) Basement Negative building pressure Low air exchange (circulation)	Aquifer conditions do not support degradation (aerobic)
Low concentra-tions in soil, groundwater & soil vapour	Moderate climate Little wind	Clay soils Solid formation Wet soils	Deep groundwater Consistent depths	Slab (good condition) Positive Building Pressure, High air exchange (circulation)	Aquifer conditions support degradation (anaerobic)

Soil vapour migration

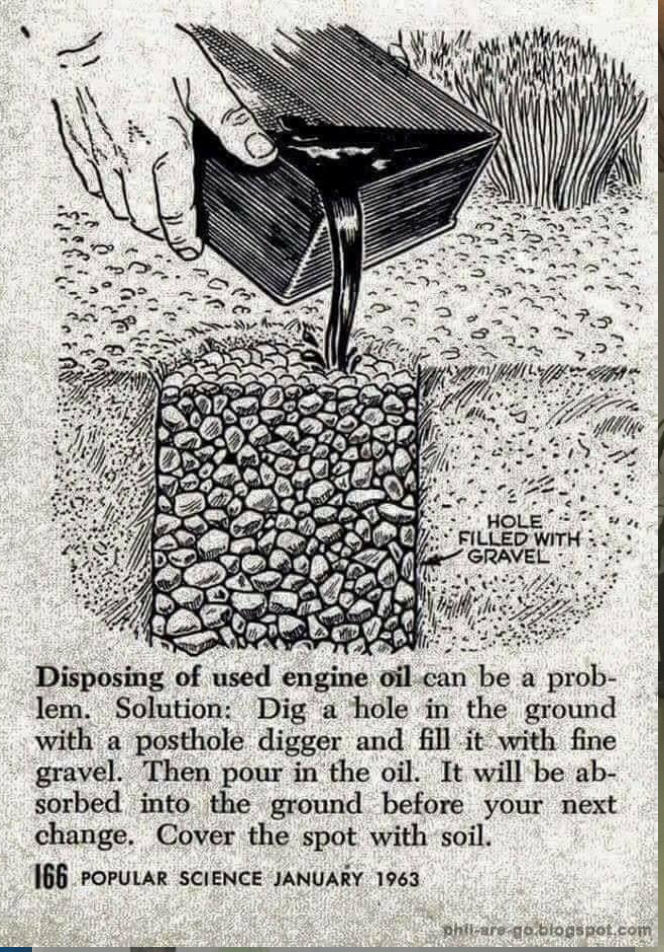


Update on mitigation properties

- Two of three properties completed with all validation sampling events no TCE detected indoors post installation
- Last sampling event occurring at first property this week and second to last sampling at second property this week
- Third property to commence shortly

Community engagement

- Two new assessment areas (Unley and Thebarton)
- Keswick soil vapour screening
- Other assessment areas
- Residents first
- Online engagement tool
- Evaluation and feedback



Disposing of used engine oil can be a problem. Solution: Dig a hole in the ground with a posthole digger and fill it with fine gravel. Then pour in the oil. It will be absorbed into the ground before your next change. Cover the spot with soil.

Thank you & questions

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