



**Activity 4c:
Enhanced ability to predict the likelihood of pipe
corrosion and its severity along the pipe**

Activity researchers : Tony Wells (UoN)

Activity 4c:

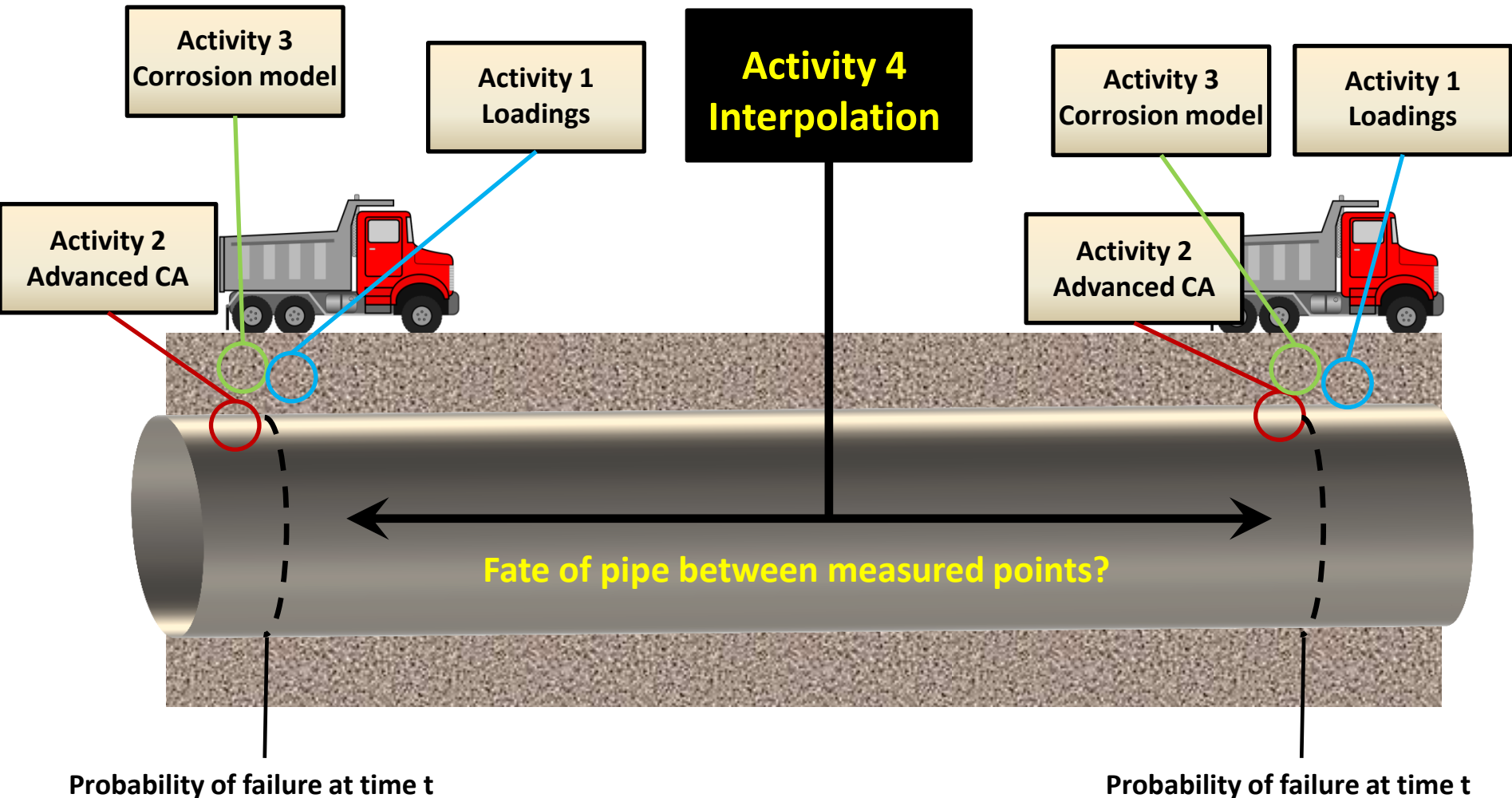
Plan for today's talk.

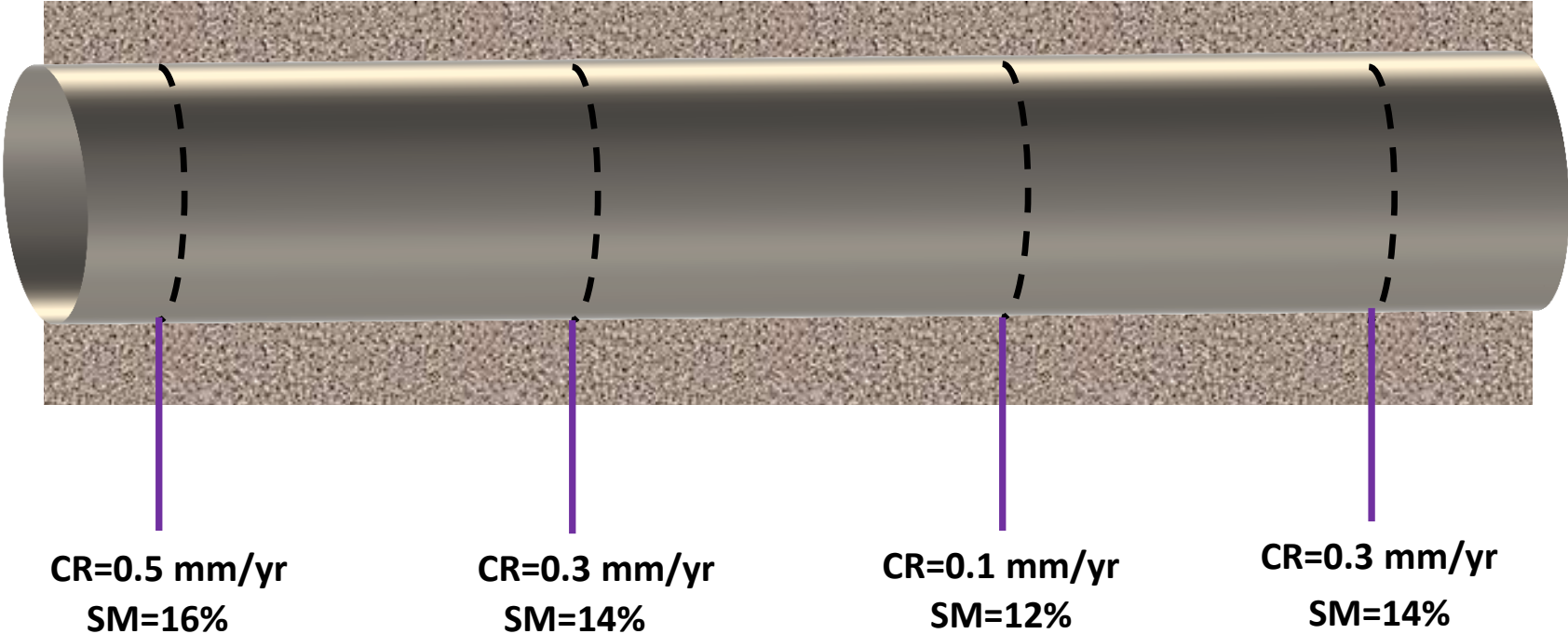
- **Activity 4c objectives**
- **Background**
- **Activity 4c sub-activities**
 - **Progress**
- **Quick look at variability of some soil properties along test bed**

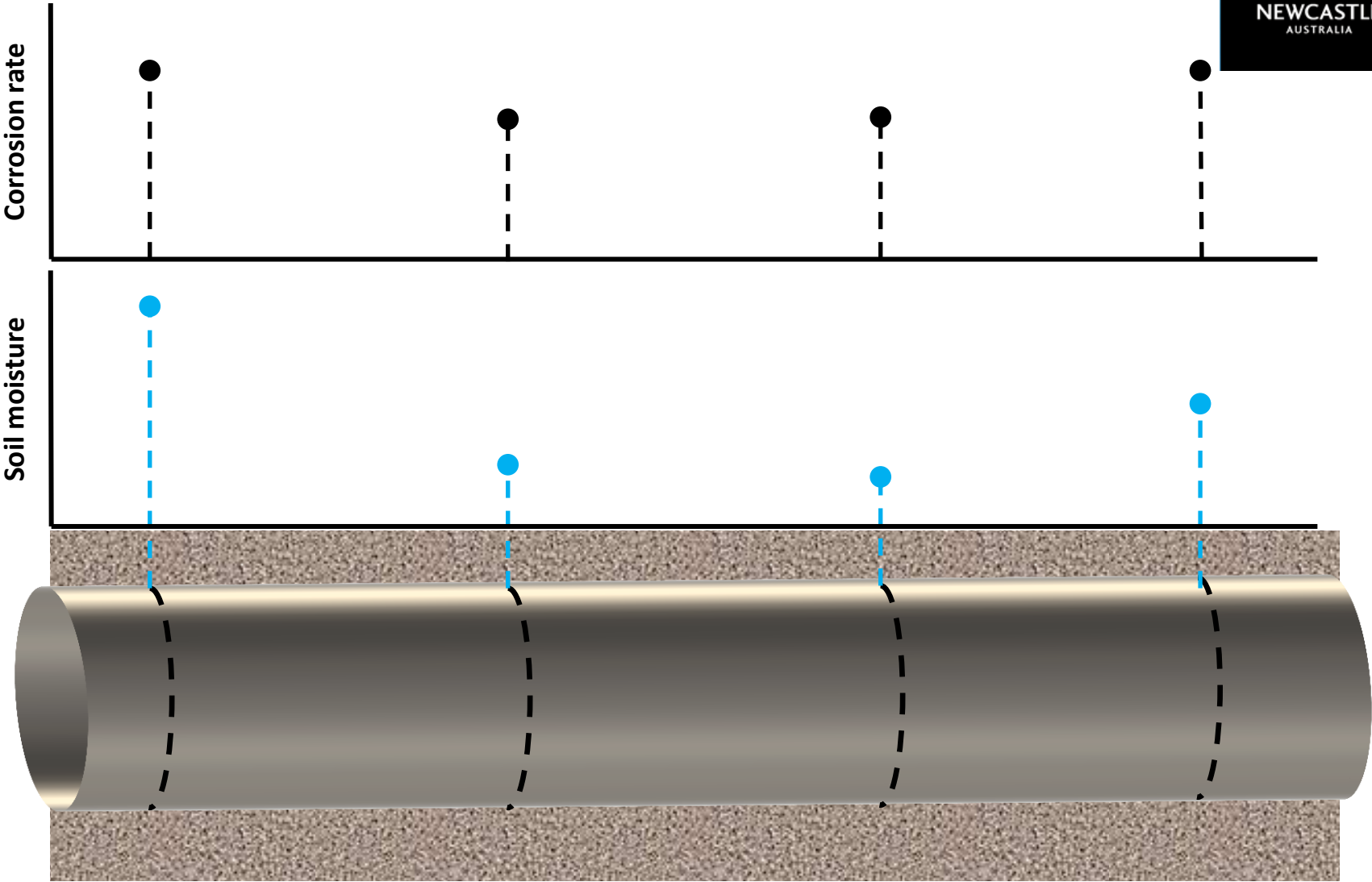


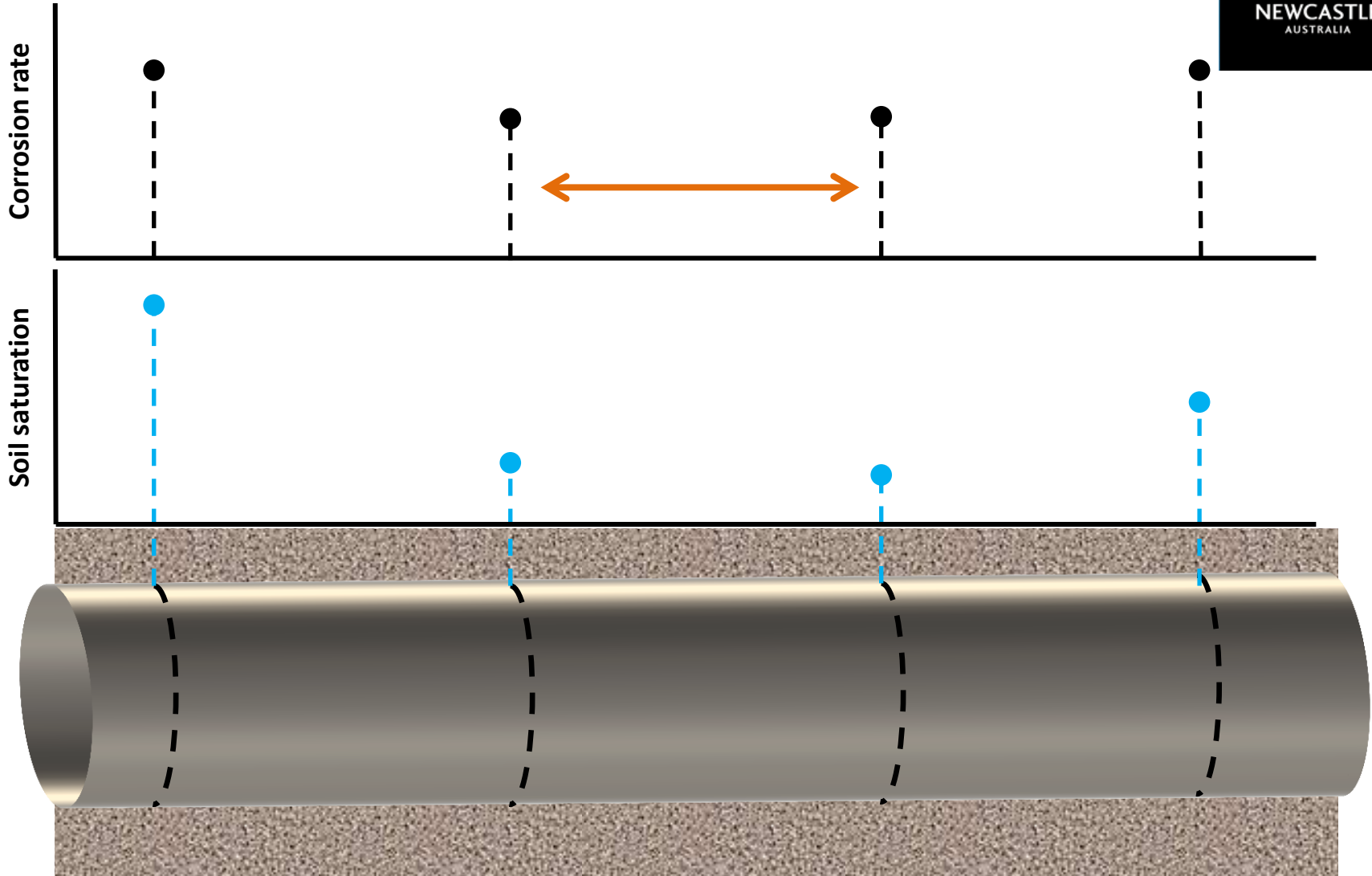
Activity 4c. Predicting pipe corrosion along the pipe

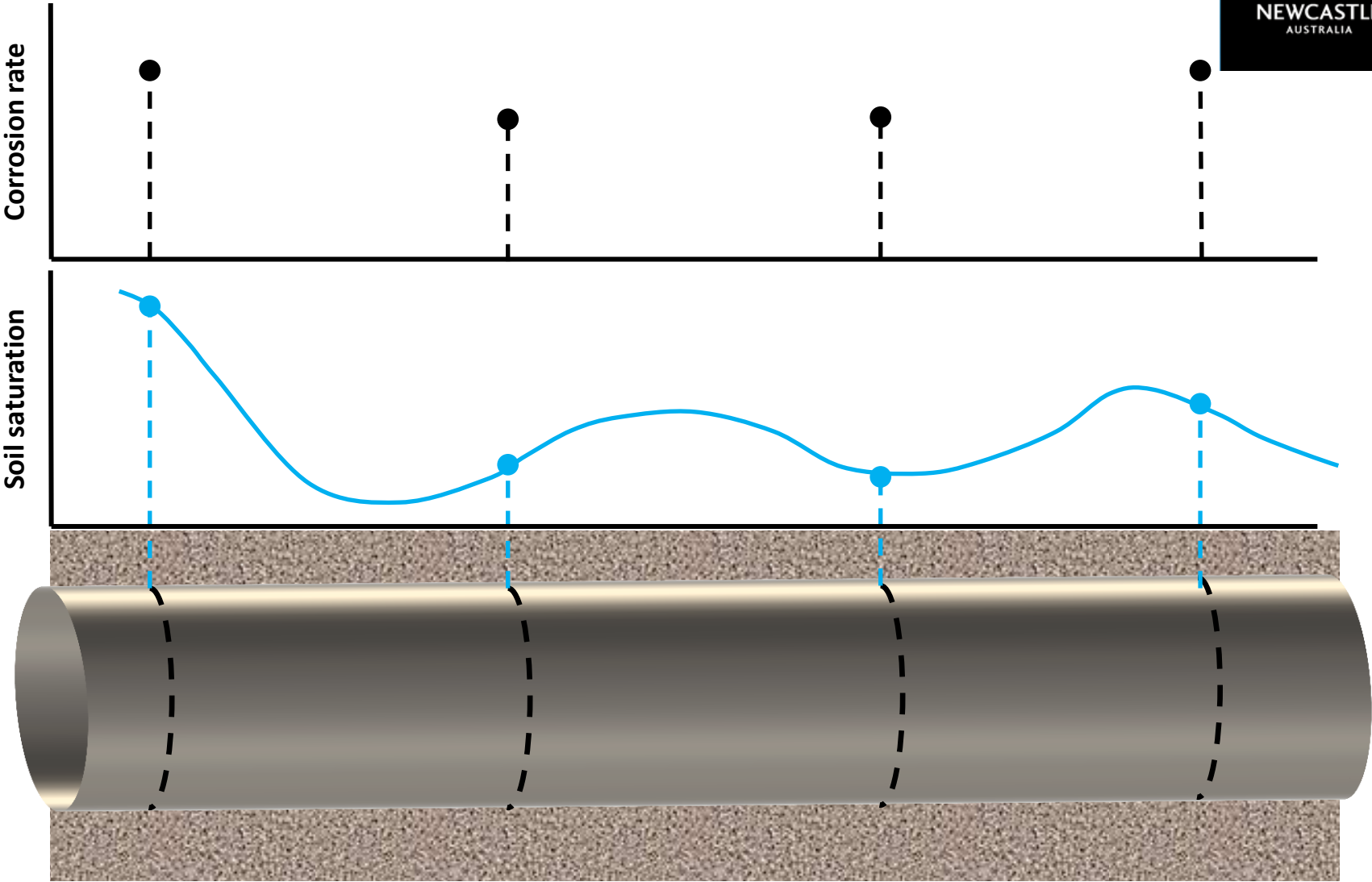
- **Objectives**
 - **Develop a methodology for interpolating soil properties relevant to pipe corrosion between measured sites**
 - **Develop a corrosion model to predict present and future corrosion condition along the pipe**

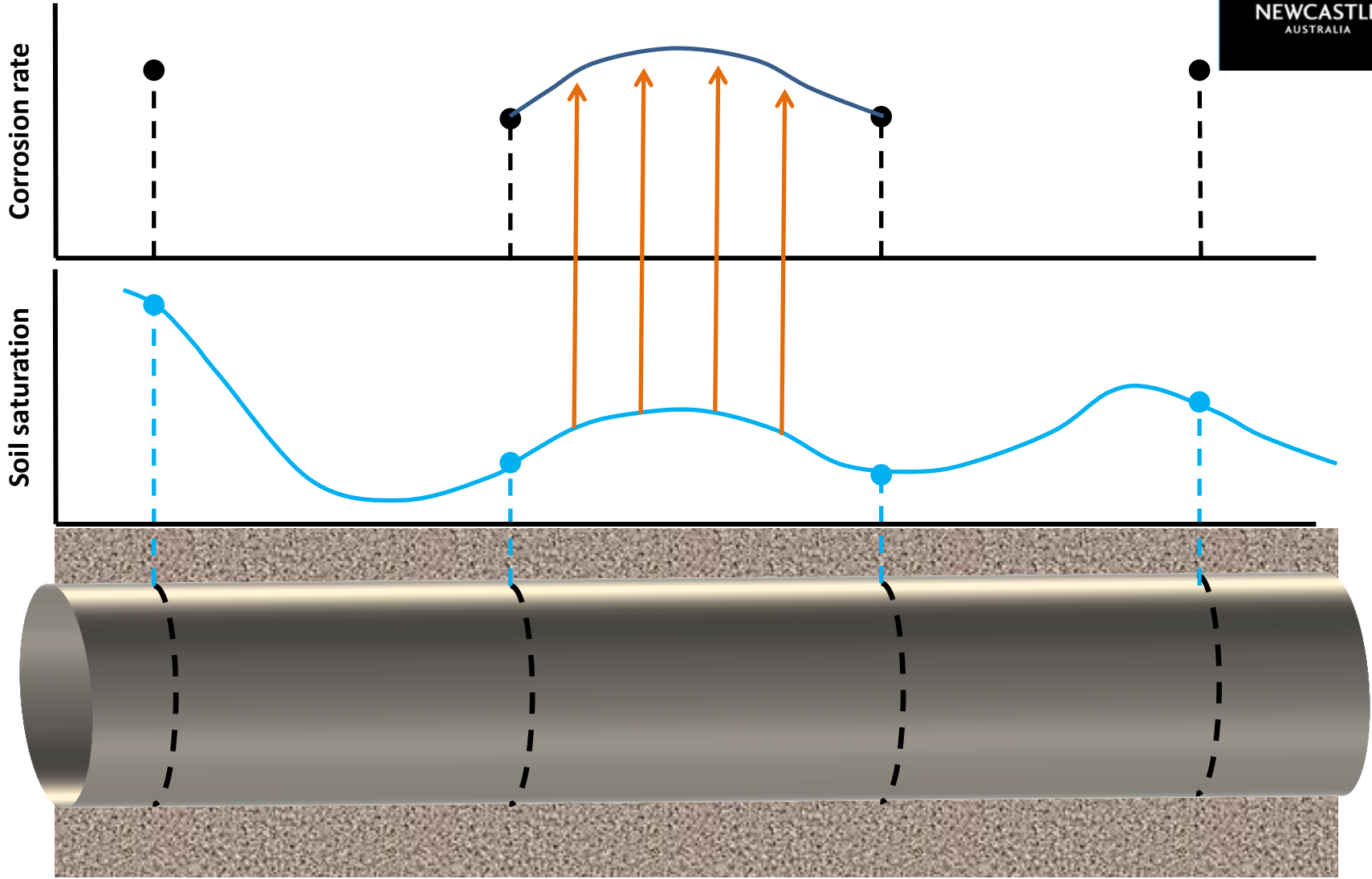


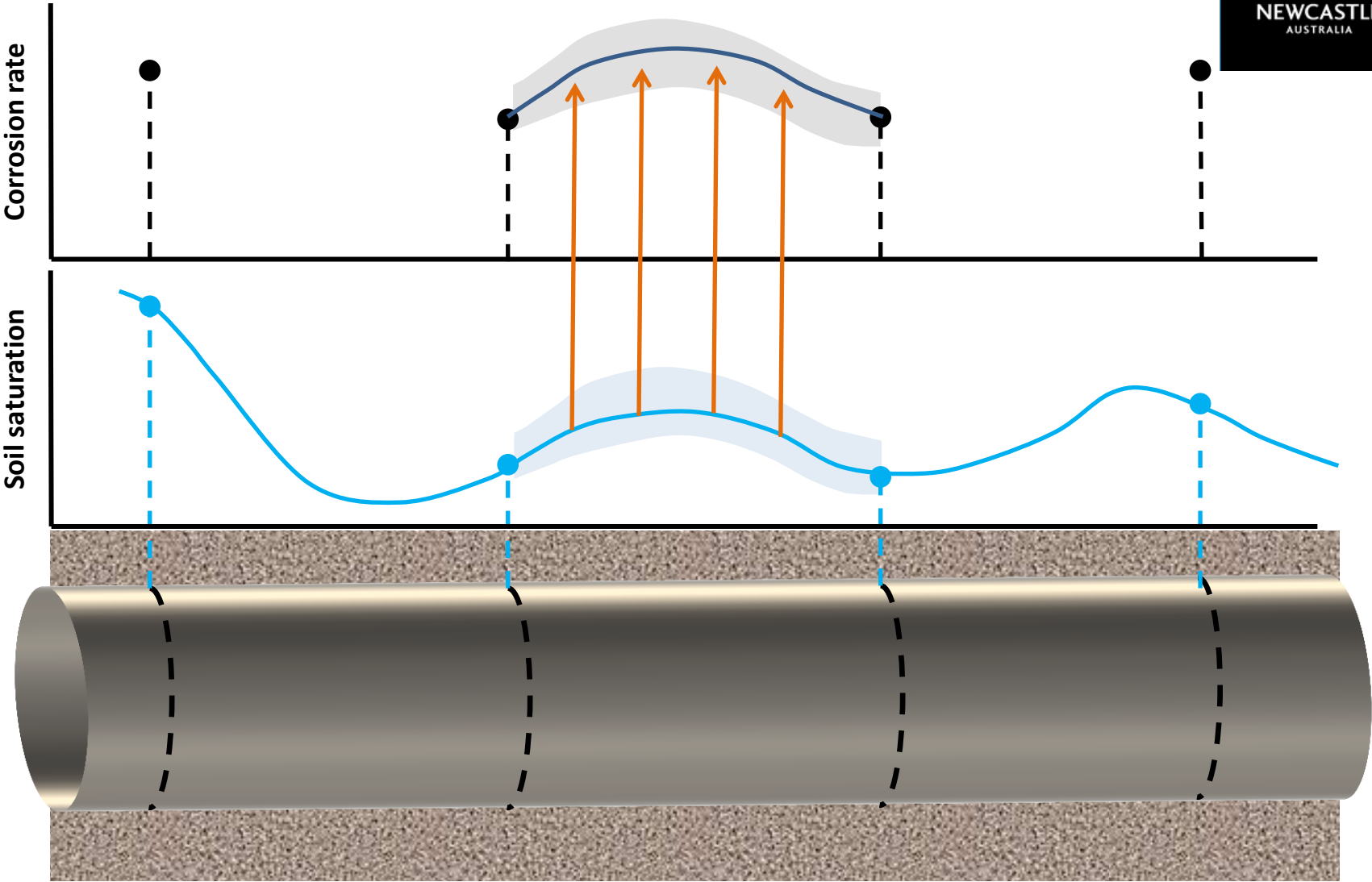




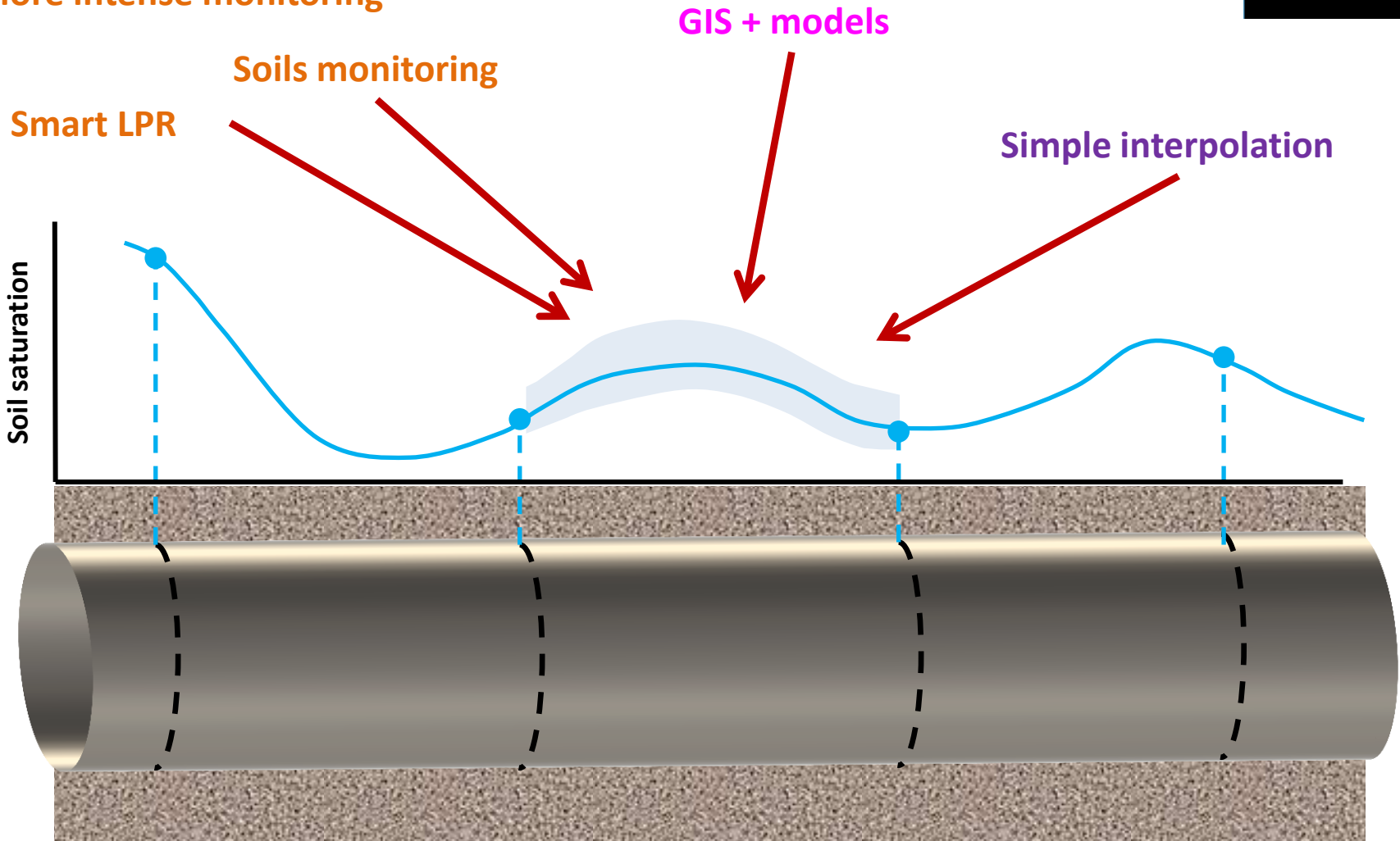








More intense monitoring



Activity 4c. Predicting pipe corrosion along the pipe

- **Bulk of activity starts Feb 2015**

Sub activities:

1. **Data requirements for interpolation**
 - i. **Identify data needed- done**
 - ii. **What data is available - ongoing**
2. **Advanced monitoring tool - ongoing**
3. **Develop methodologies for doing interpolation**
4. **Validation of interpolation procedure**
5. **Integration of interpolated corrosion model into failure model**

Activity 4c. Predicting pipe corrosion along the pipe

Sub activities:

1. Identify sources of soil data important to corrosion model

1. What factors important – Activity 3

a) Long term average soil saturation

- i. Long term soil moisture
- ii. Soil texture
- iii. Soil bulk density

b) Soil chemistry?

- i. Nitrates
- ii. Sulphates
- iii. Carbonates

Activity 4c. Predicting pipe corrosion along the pipe

Sub activities:

1. Identify sources of soil data important to corrosion model

a. What factors important – (Activity 3)

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ii. Soil chemistry?

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b. What data available and what more is needed – ongoing - GIS soils maps

Activity 4c. Predicting pipe corrosion along the pipe

Sub activities:

2. Feasibility assessment of advanced monitoring tool - ongoing

i. Long term average soil saturation

i. Long term soil moisture

- One off measurement – Probe/Lab analysis
- Modelled
- Long term logging

ii. Soil texture

iii. Soil bulk density

- Lab analysis of grab samples
- Soils maps (resolution?)

ii. Soil chemistry?

i. Nitrates

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- No robust probes for measurements in soil environments
 - (ion selective probes for aqueous only)
- Lab analysis of grab samples

Activity 4c. Predicting pipe corrosion along the pipe

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One off measurement

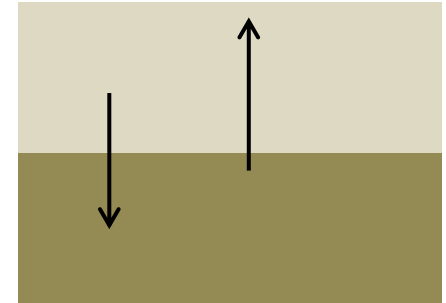
- **Fast, easy**
- **Representative?**



Long term logging

Best data

**Deployment/recall
Slow**



Modelling

Fast

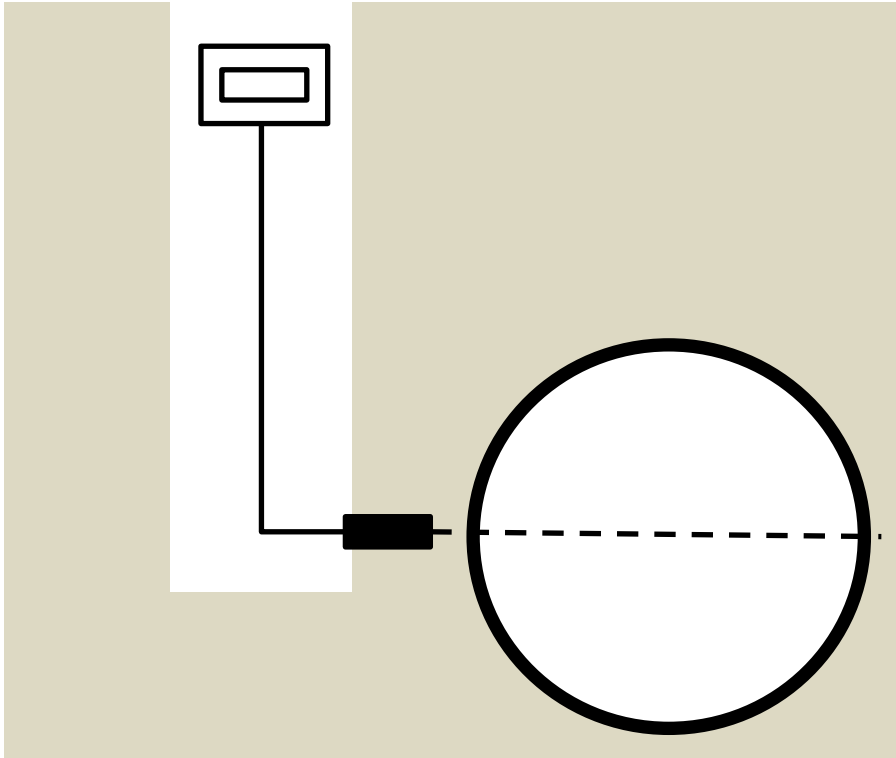
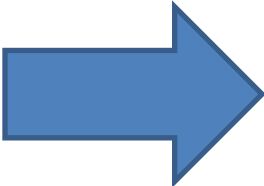
Mapping

Accurate

Data input (slow?)



SMR110
SOIL MOISTURE RECORDER



Bury for 2 months in easement
over ~100m



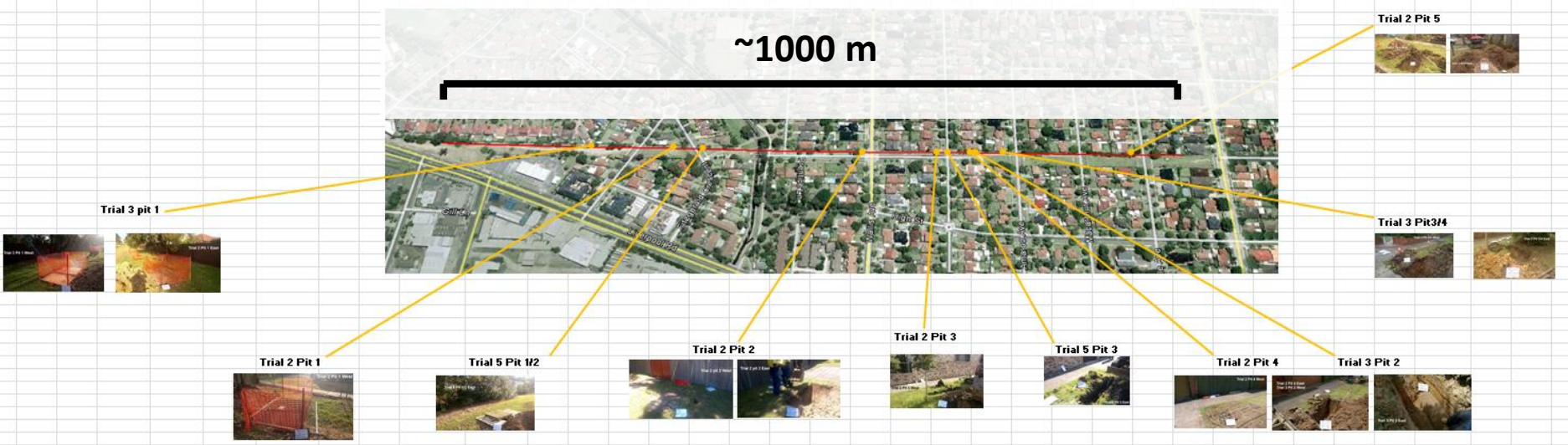
100 m

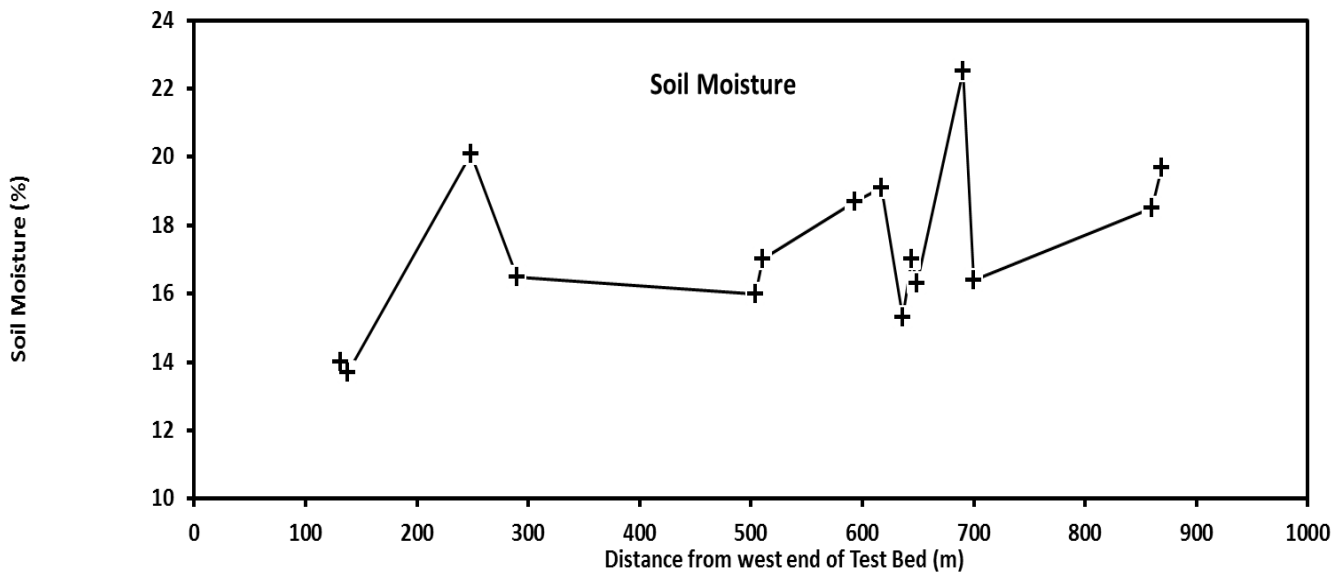
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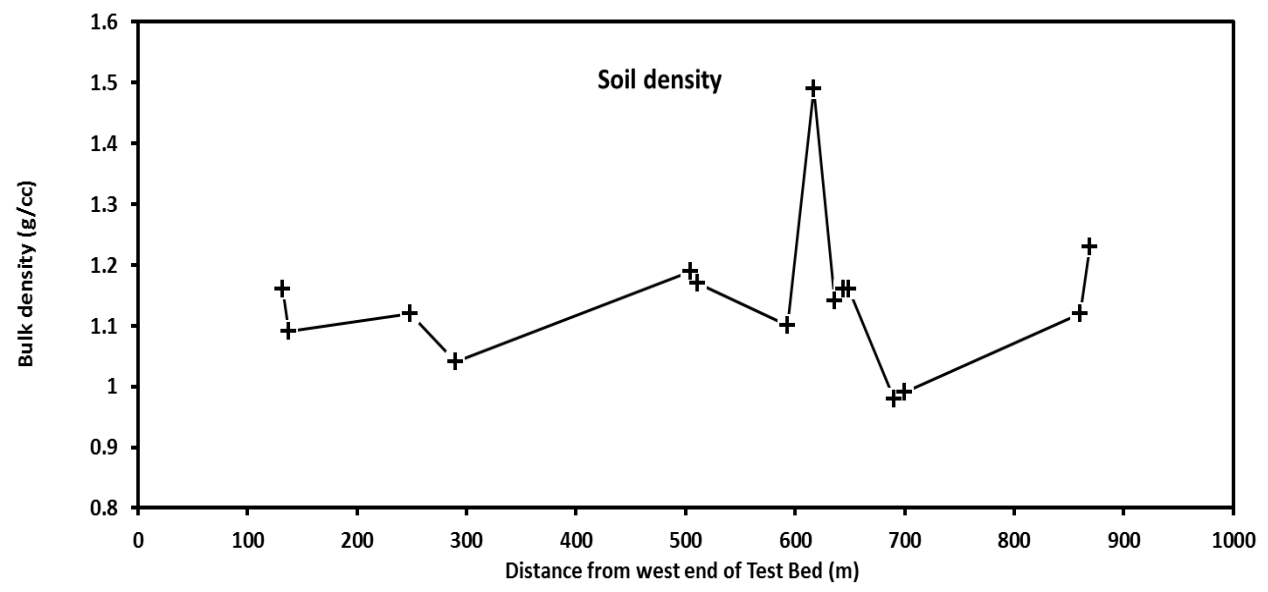


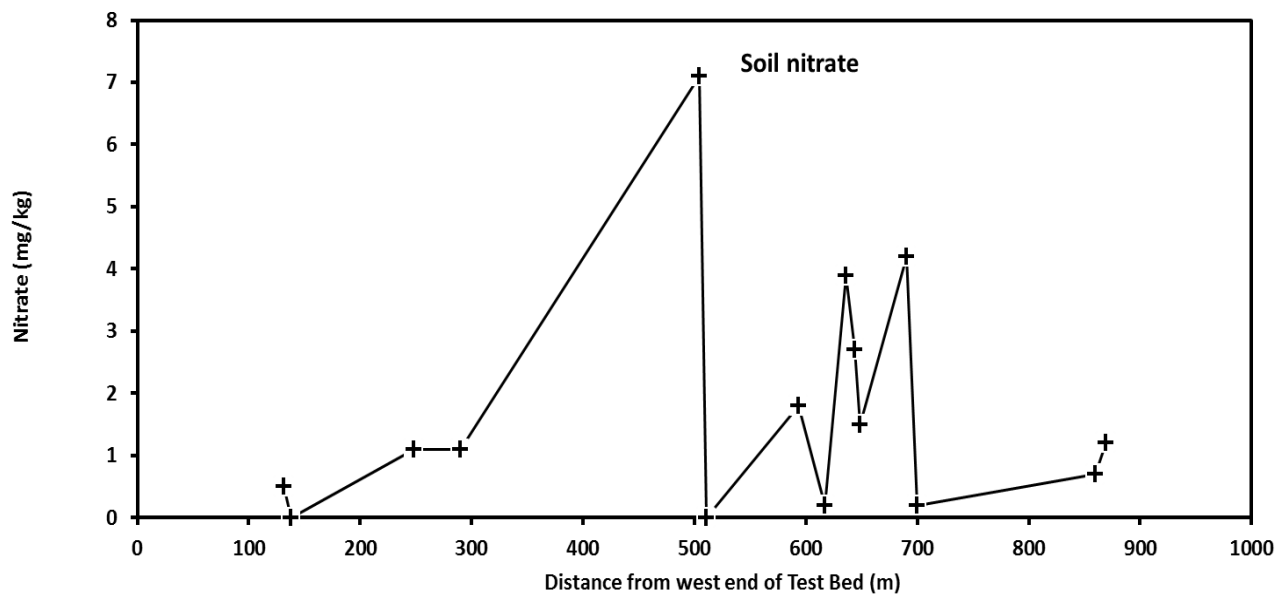
100 m

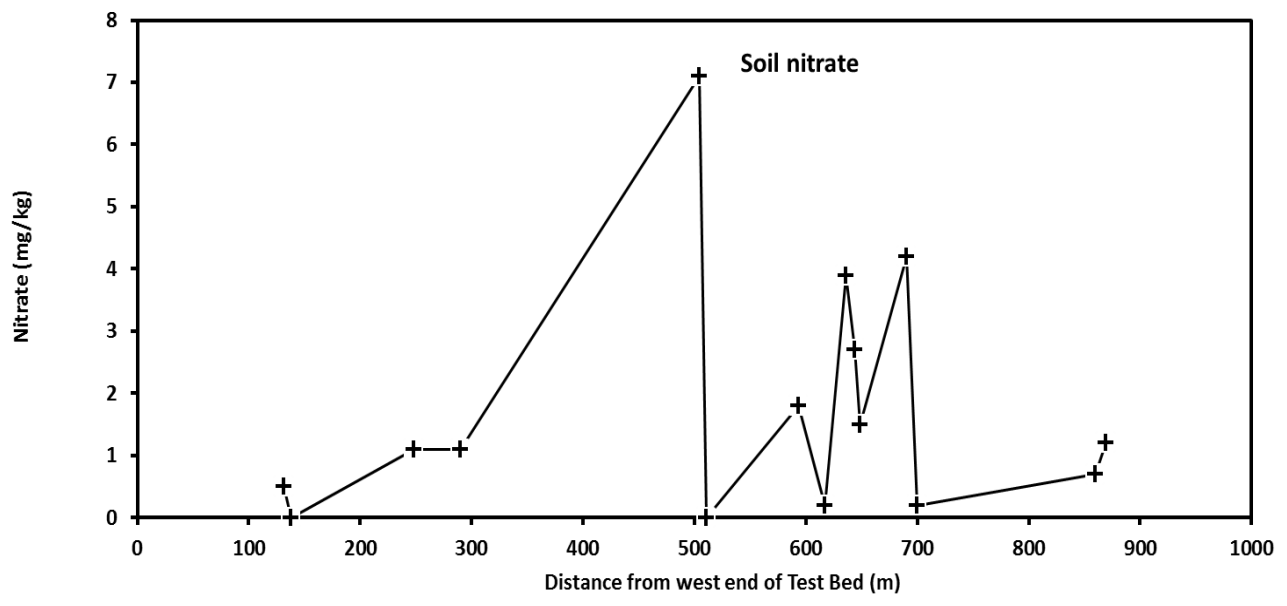
Quick look at variability of some soil parameters along the test bed

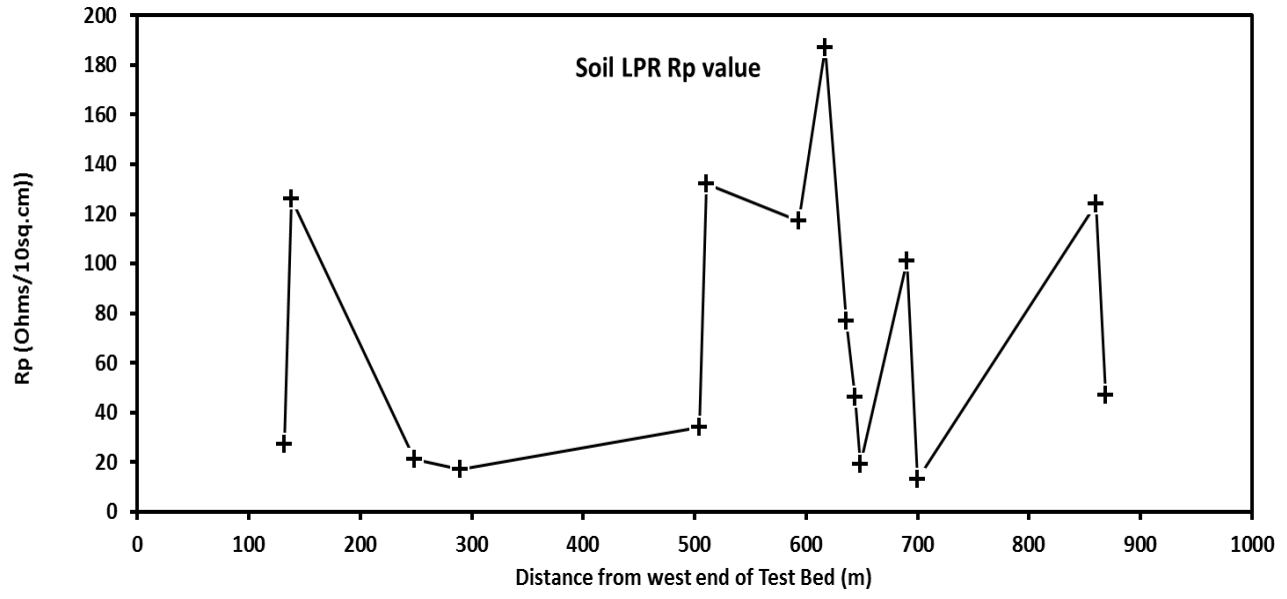














Activity 4c. Predicting pipe corrosion along the pipe

- Plan for future work

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The end