

## Inspection and Troubleshooting of On-site Wastewater Management Systems

### Inspection and Troubleshooting Scenarios II


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## Scenario 1




Figure 1: System for Servicing - Scenario 1



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## Scenario 1

- You arrive to undertake an inspection at the AWTS shown in Figure 1.
- Initial observation of the lids (Figures 2 and 3) identifies some damage.
- What implications might this have for WHS?
- In what respect might the damaged lids affect the treatment system performance?

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## Scenario 1



Figures 4 & 5: Primary Chambers

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## Scenario 1

- Primary treatment takes place in two chambers shown in Figures 4 and 5 which are separated by a baffle.
- Comment on the status of the Primary treatment chambers. Would you expect Primary treatment to be satisfactory?

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## Scenario 1



Figure 6: Sludge Depth Test - First Primary Chamber

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## Scenario 1

- Figure 6 shows the result of a sludge depth test undertaken in the first Primary chamber.
- Comment on the result of the sludge depth test and the need for sludge removal by pump-out.

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## Scenario 1



Figure 7: Aeration Chamber

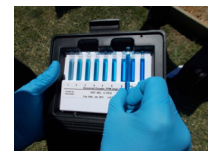


Figure 8: Dissolved Oxygen



Figure 9: pH

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## Scenario 1

- Figure 7 shows the aeration chamber. Figures 8 and 9 show the results of dissolved oxygen (DO) and pH tests.
- Comment on the performance of the aeration chamber.
- What adjustment to the aeration would you make as a result of your observations?

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## Scenario 1



Figure 10: Clarification Chamber



Figure 11: Turbidity 12 NTU

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## Scenario 1

- Figure 10 shows the clarification chamber and Figure 11 a sample of the clarified effluent being tested in a turbidity tube. The turbidity is 12NTU.
- Would this effluent be sufficiently well treated for effective disinfection using chlorine or UV? Give a reason for your answer.

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## Scenario 1 – Subsequent inspection



Figure 12: Clarification Chamber – Subsequent service



Figure 13: Sludge depth test – Subsequent service

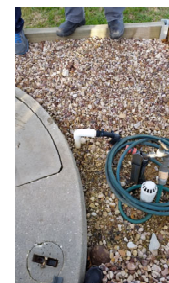



Figure 14: No filter on irrigation

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## Scenario 1

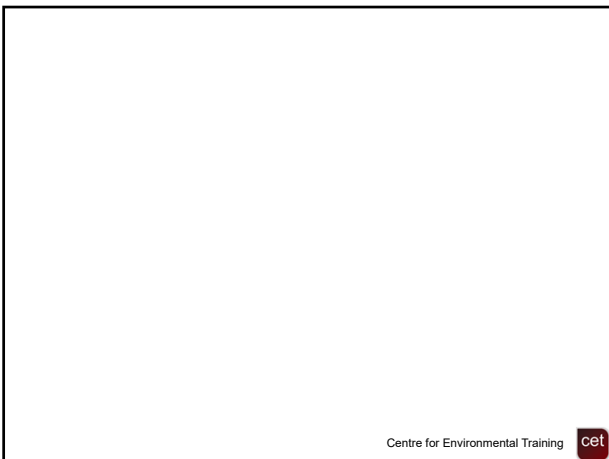
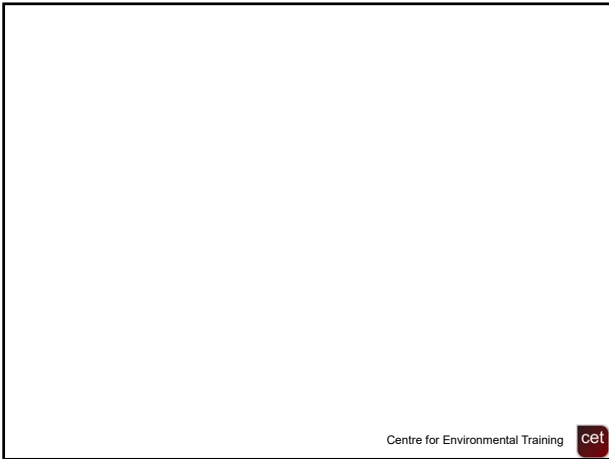
- On a subsequent inspection of the same system, you notice significant build-up of solids in the clarification chamber (Figure 12). A sludge depth test in the clarification chamber (Figure 13) confirms that the clarification chamber is very largely filled with sludge.
- What might be the cause of this problem?

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## Scenario 1

- The system disposes of treated effluent to a subsurface irrigation area. The irrigation system has no filter (Figure 14).
- What impact would you expect the build-up of solids in the clarification chamber to have had on the subsurface irrigation system?
- What action would you recommend to service the irrigation system?

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## Answers Scenario 1

- Figures 2 & 3 – Lids might collapse. Ingress of water affects treatment. Broken bits of lid might fall in and cause damage.
- Figures 4 & 5 – Good crust, would expect anaerobic processes to operate satisfactorily
- Figure 6 – Minimal sludge; no need for pumpout.
- Figure 8 – DO 8-10mg/L is high, pH 7 is satisfactory. Could reasonably reduce the amount of air supplied. DO needs to be >2mg/L, but not too much higher.
- Figures 10 & 11. Clarification chamber clarity looks fair, but turbidity needs to be <5NTU for disinfection by chlorine and <1NTU for disinfection by UV, i.e. is not satisfactory.
- Low amount of food and high aeration and light brown colour indicates possible sludge loss (low F/M ratio)/carry over.

## Answers Scenario 1 (cont.)

- Figures 12 & 13 – No solids removal from clarification chamber. Air lift not working? Possibly too much air to aeration.
- Potential for solids to block irrigation.
- Need to flush irrigation. Check have adequate flushing velocity. Check pressure with gauge.
- Recommendations:
  - Reduce aeration
  - Fix broken sludge return
  - Add filter (disk filter)
  - Flush irrigation system
  - Check pressures and flushing velocity