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|   | Annual Performance &<br>Monitoring Review<br>BR9685IX<br>Dow Corning Ltd | BR9685IX<br><br>2016 |
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# Annual Performance and Monitoring review EPR Permit BR9685IX, Dow Corning Ltd

This report is to fulfil ERP permit BR9685IX condition 4.2.2

4.2.2 - For the following activities referenced in schedule 1, table S1.1 (A1 to A18) A report or reports on the performance of the activities over the previous year shall be submitted to Natural Resources Wales by 31 January (or other date agreed in writing by Natural Resources Wales) each year. The report(s) shall include as a minimum:

(a) a review of the results of the monitoring and assessment carried out in accordance with the permit including an interpretive review of that data

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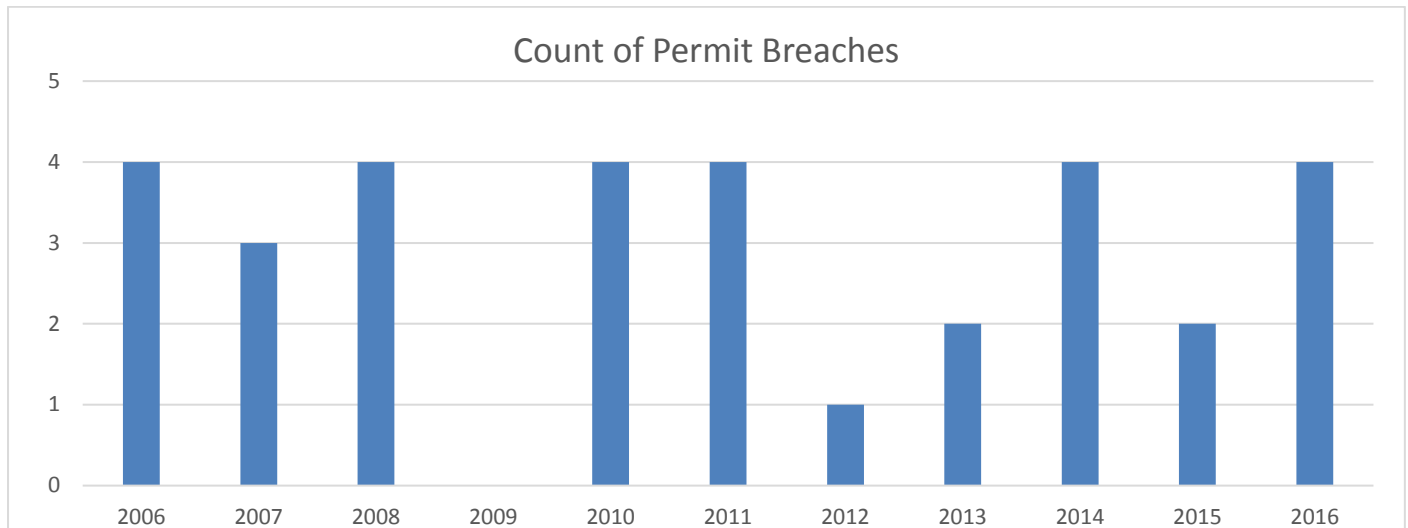
## Summary

The full report includes details of our performance during 2016 . SPC charts have been used for all analytical monitoring we carry out for releases to air and water.

Points of interest for 2016 :

- Methyl chloride venting to atmosphere from A12 has increased. This has been discussed with NRW and is a conscious decision to allow Dow Corning to increase the on line time of one of the Recovery processes, thus reducing the quantity of solid hazardous waste produced. This waste is shipped to Europe for recovery, so reducing at source has an environmental benefit.
- The DPR stockpile has reduced significantly during 2016 due to being able to ship lots of material to Germany for recovery. This can be seen in the Waste graphs.
- 2 authorised air release points were unable to be sampled at times during 2016. These have now been fixed and have subsequently been sampled.

## Incidents



There were 4 permit breaches reported in 2016:

### A41 (W949 ERU) – HCl and Cl<sub>2</sub>

Failure of a fridge unit resulted in excessive methyl chloride flows being sent to the ERU. It is believed that for 17.5 hour period HCl and Cl<sub>2</sub> levels were above the permitted level. On identifying the issue, and confirming using sample tubes, immediate corrective actions were taken to revert methyl chloride flows to within standard operational flow rates. Tube sampling showed the levels had reverted to normal.

### A50 (W957 Hydrogen plant) CO

The hydrogen plant had a weld failure on a coil outlet header which caused a CO exceedance. The exchanger has been repaired and a retest was carried out which was well within the permit limit.

### A17 (W930 reactor) Copper chloride

A damaged and incorrectly sealed filter element caused a visible release of Copper chloride. The filter elements were replaced and were confirmed as being correctly sealed prior to further use.

### W810 (tank farm) DPLB chlorosilane

A leak of chlorosilane from a damaged Nitrogen pressure gauge assembly occurred during preparation of a line for maintenance. The leak was isolated quickly by emergency response personnel. The standard for Nitrogen pressure gauge assemblies has been updated to prevent a reoccurrence.



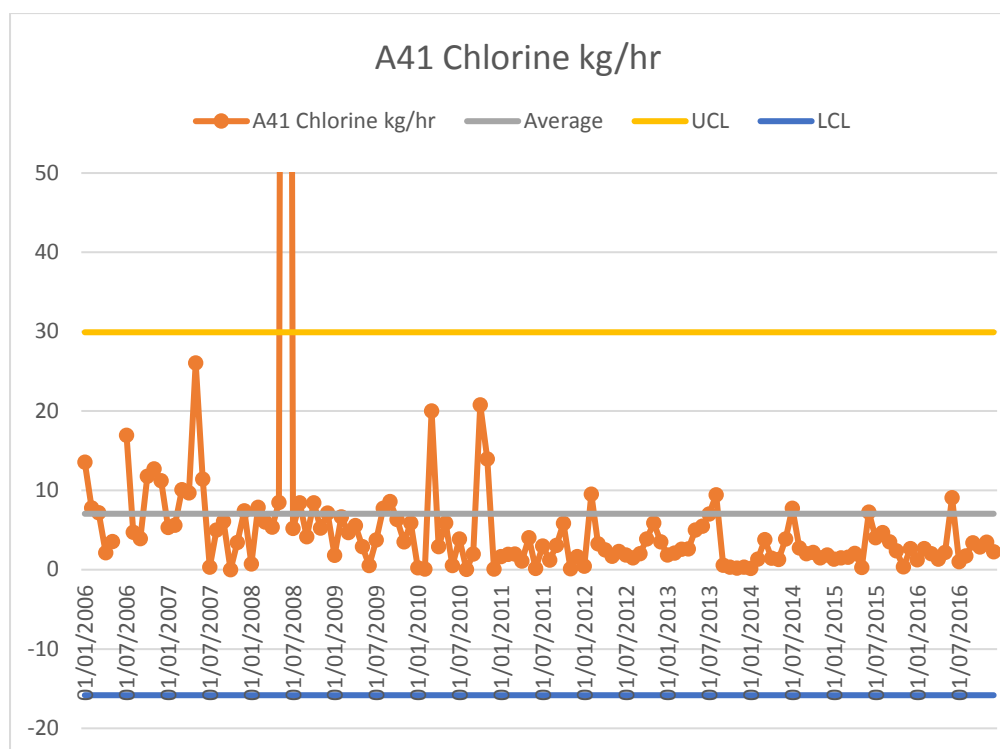
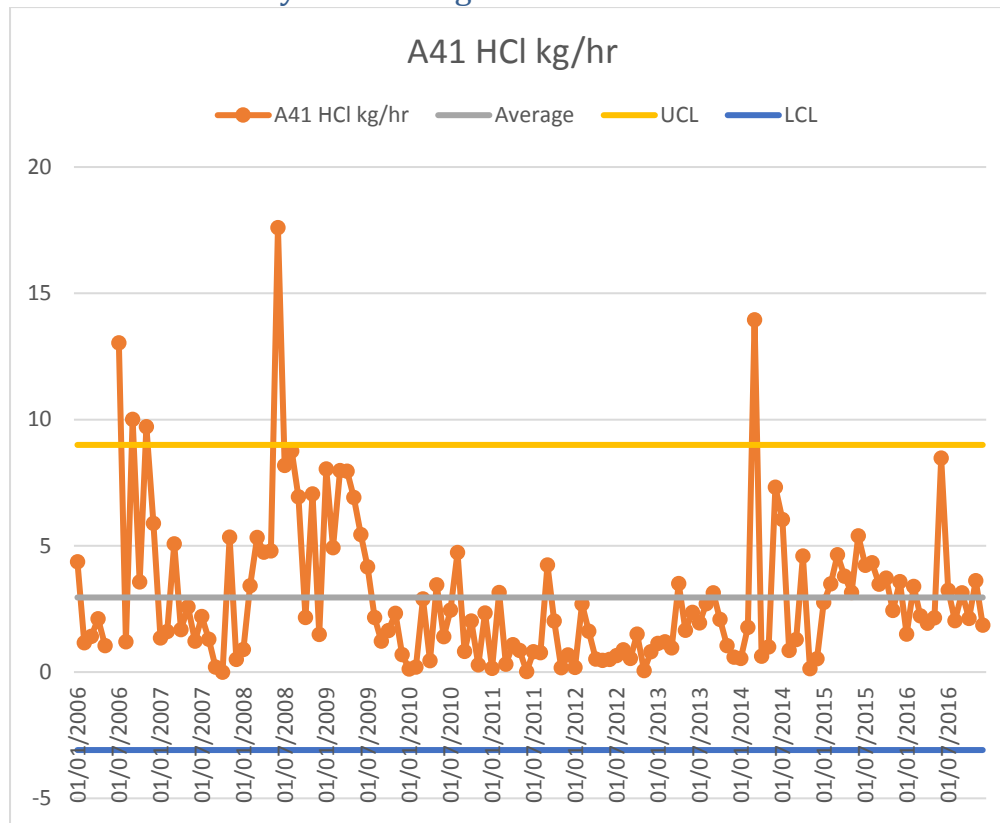
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## Air monitoring

### Trends for Monthly monitoring





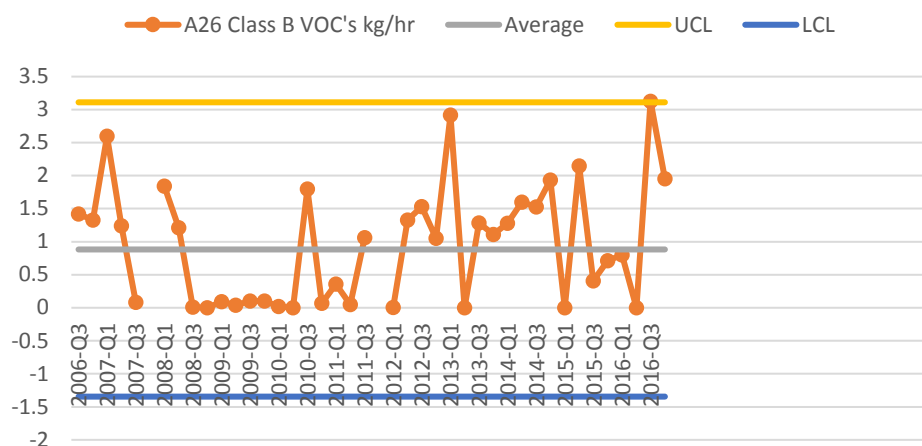
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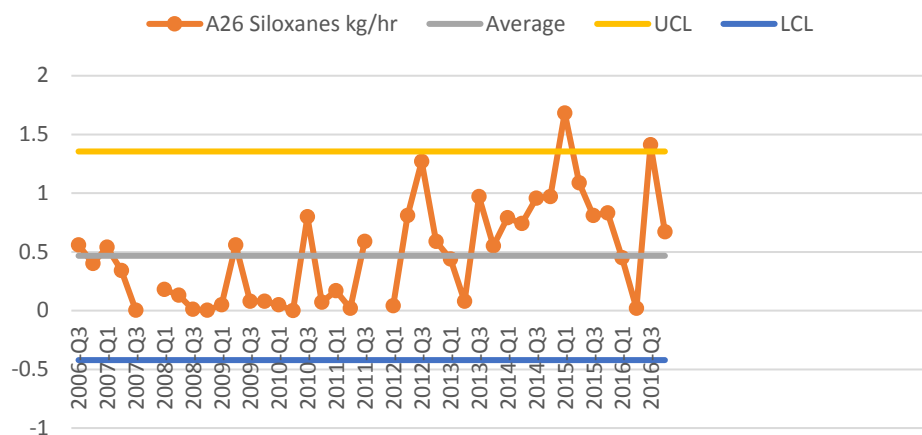
### Trends for Quarterly monitoring:

A26 Class B VOC's kg/hr



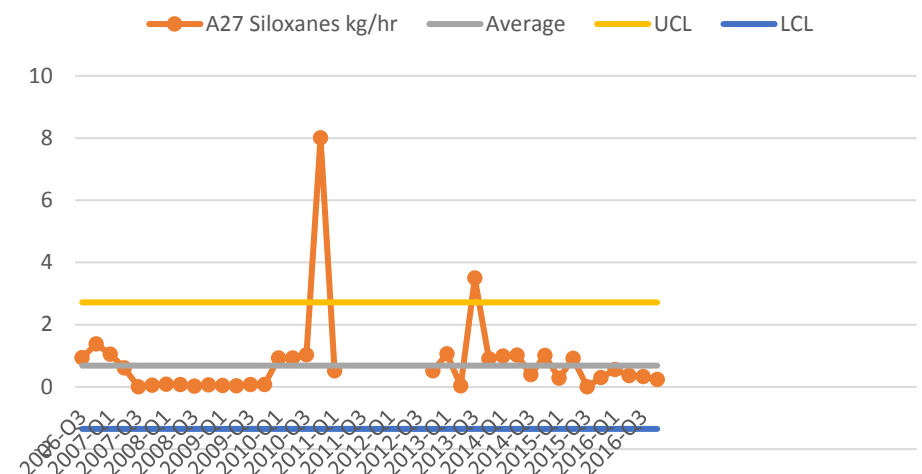
Results in control.

A26 Siloxanes kg/hr



One result out of control during 2016, there was no assignable cause for this and the Q4 sample is back within control.

A27 Siloxanes kg/hr



Results in control.



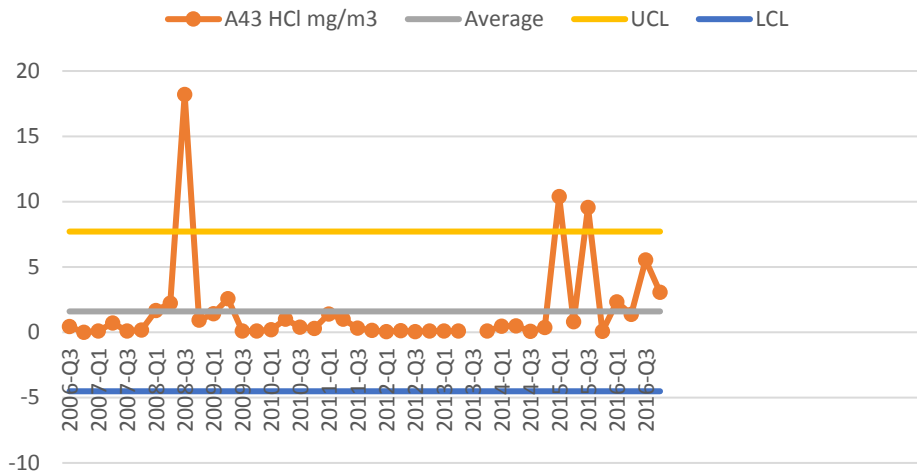
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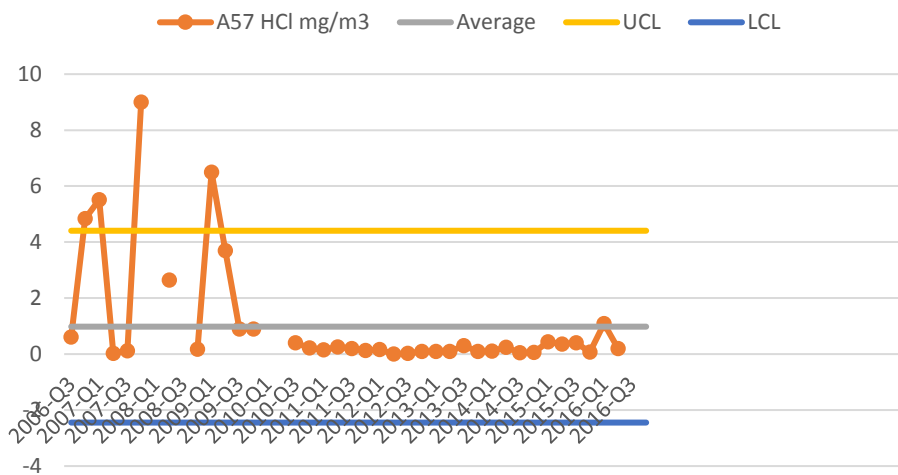
2016

### A43 HCl mg/m3



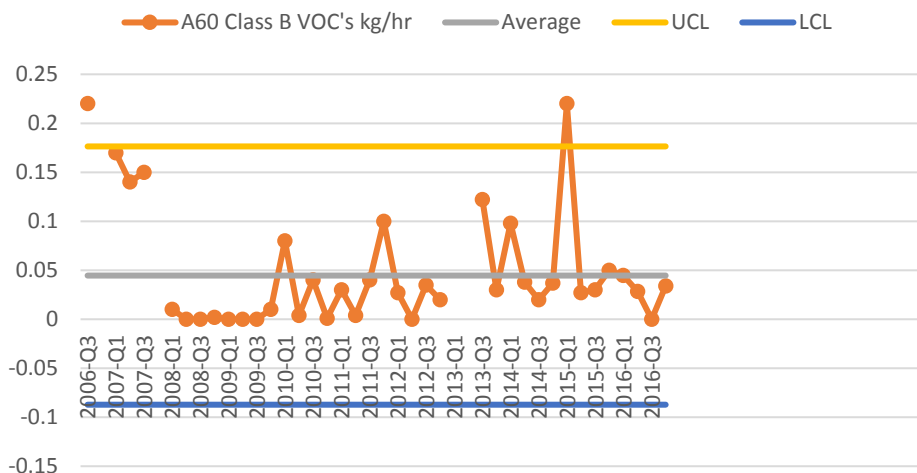
Results in control and within permit limit (10mg/m3).

### A57 HCl mg/m3



No samples were taken during Q3 or Q4 as there were safety concerns with being in the proximity of the sample point. These have now been resolved. Results in Q1 and Q2 were in control and within permit limit (10mg/m3).

### A60 Class B VOC's kg/hr



Results in control.

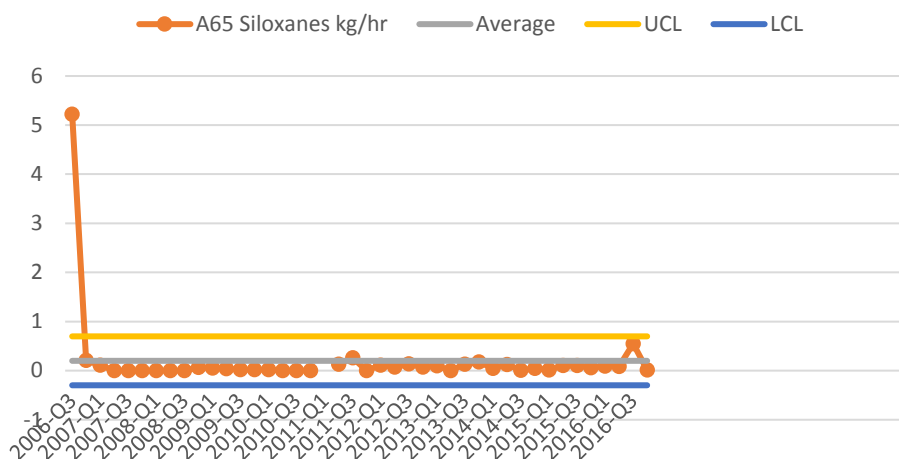


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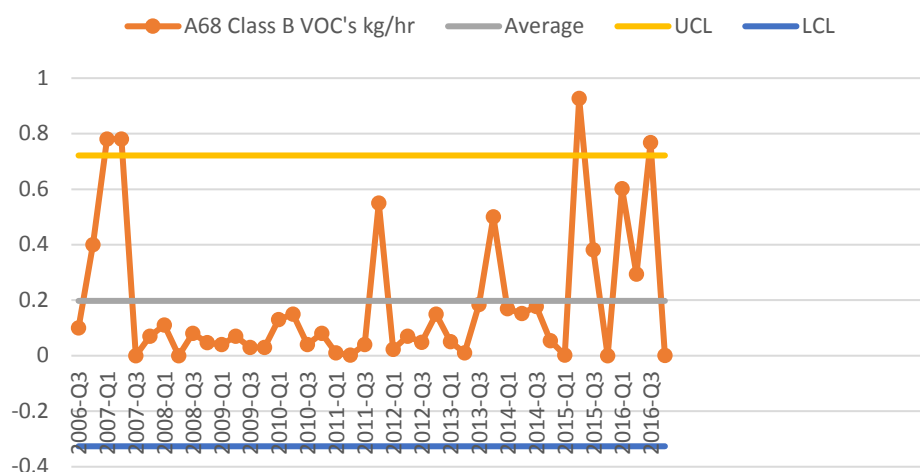
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### A65 Siloxanes kg/hr



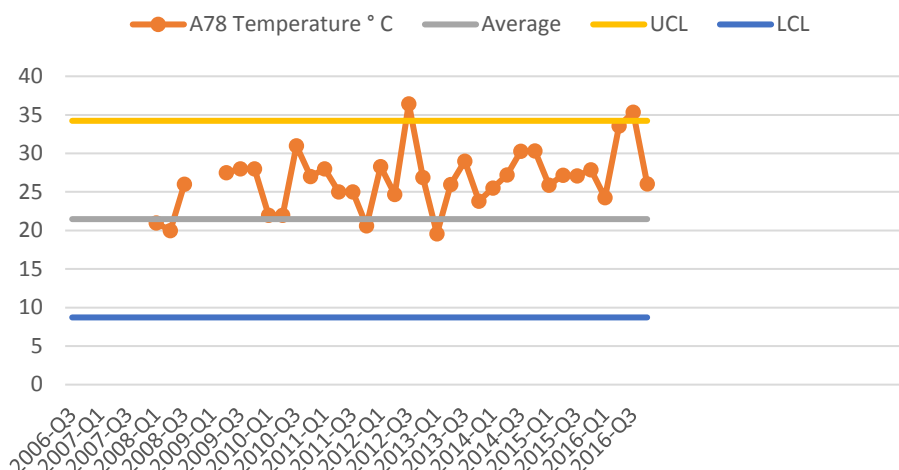
Results in control.

### A68 Class B VOC's kg/hr



Q3 result was just out of control, but was back in control in Q4.

### A78 Temperature ° C



Q2 result was nearing the control limit and Q3 result was just out of control high. This was picked up during an internal audit and an action plan put in place to investigate. PCR to be installed to improve temperature control loop and condenser clean also planned for next shutdown.

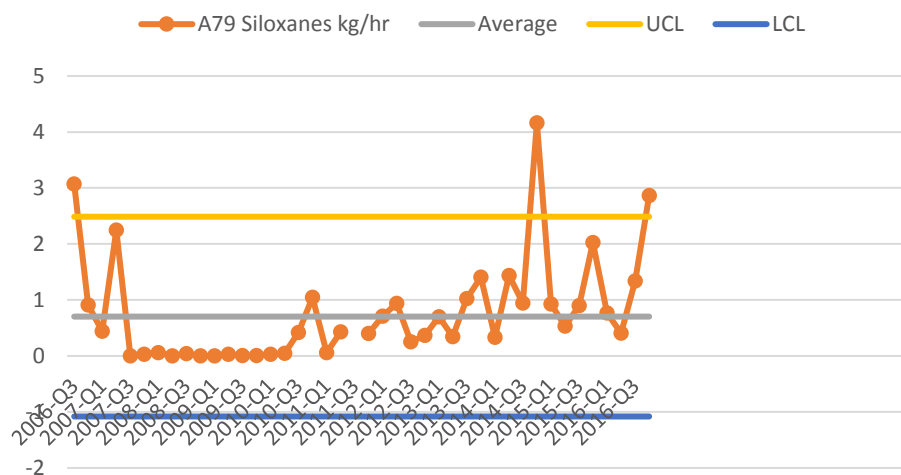


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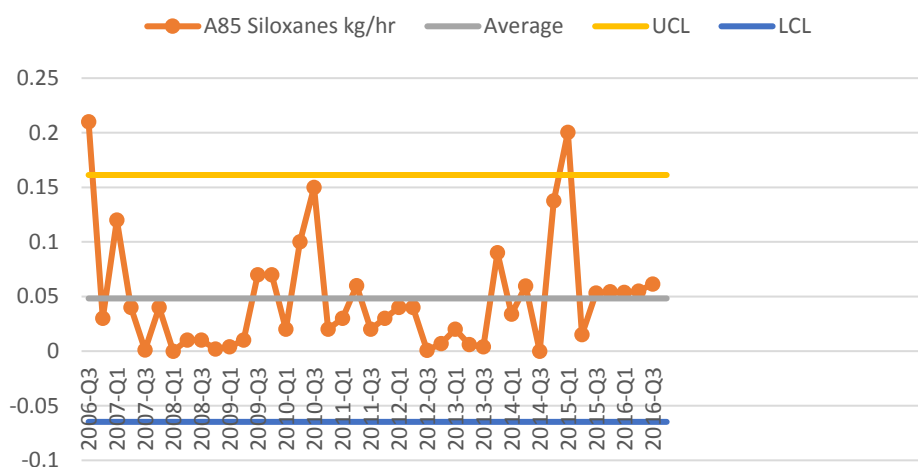
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### A79 Siloxanes kg/hr



Q4 result out of high, Q1 and Q2 2017 results are back at normal levels.

### A85 Siloxanes kg/hr



No sample was taken during Q4 as there was an issue with the sample point. This has now been resolved. Results in control for Q1-Q3.





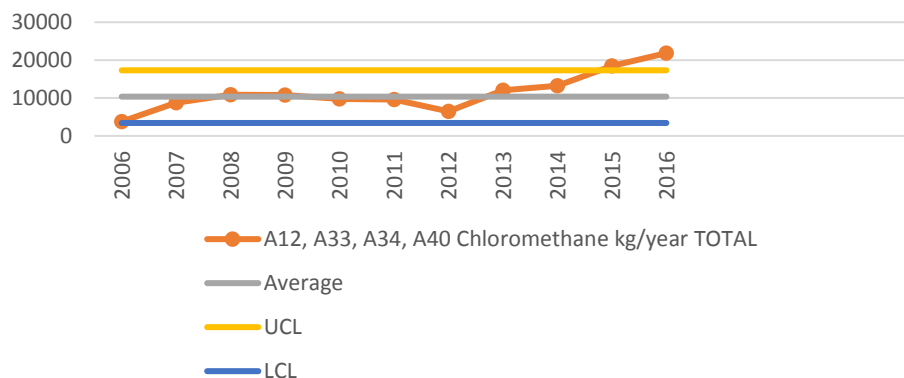
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### Trends for Annual monitoring:

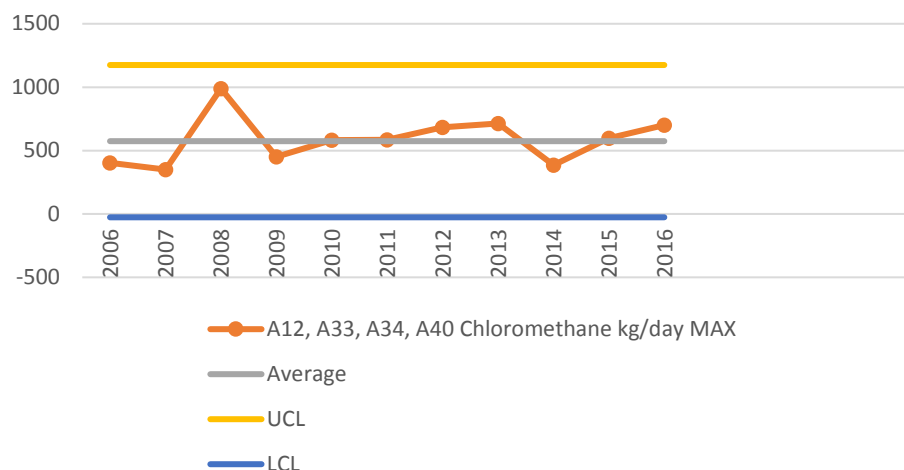
A12, A33, A34, A40 Chloromethane kg/year  
TOTAL



Results out of control high but within permit limit (60,000 kg/year).

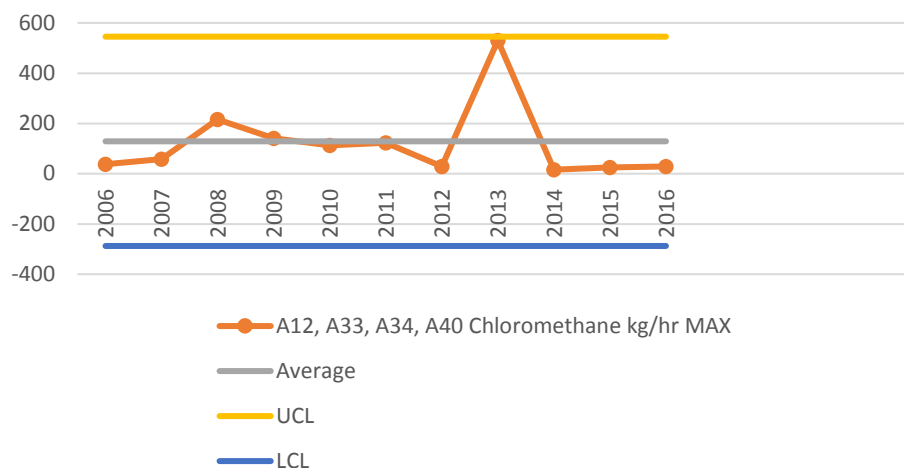
This has been discussed with NRW and is a conscious decision to allow Dow Corning to increase the on line time of one of the Recovery processes, thus reducing the quantity of solid hazardous waste produced.

A12, A33, A34, A40 Chloromethane kg/day MAX



Results in control and within permit limit (1000 kg/day).

A12, A33, A34, A40 Chloromethane kg/hr MAX



Results in control and within permit limit (250 kg/hr).

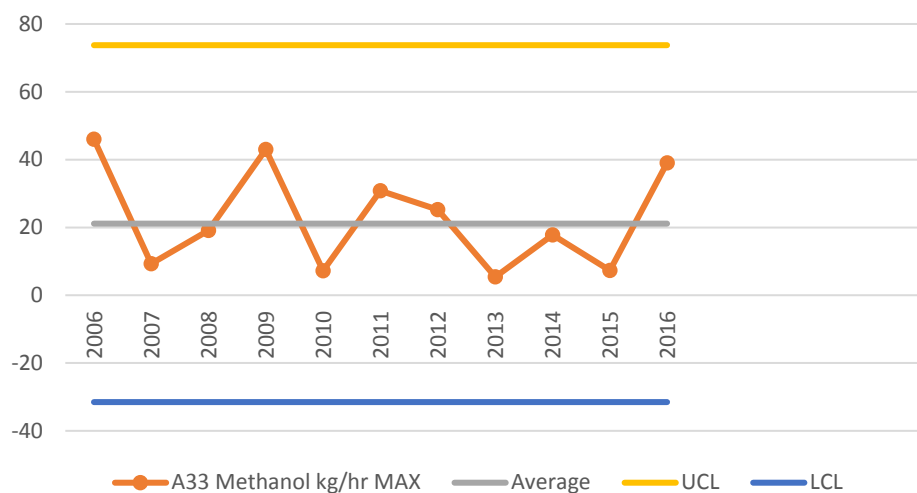


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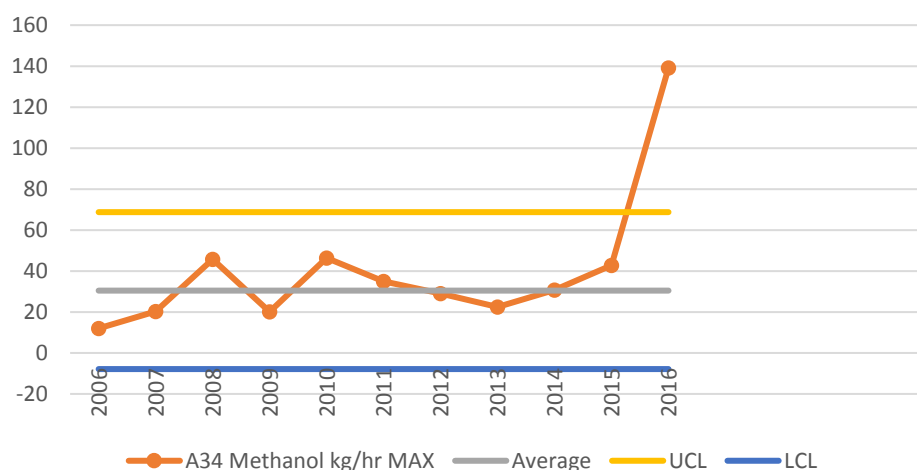
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A33 Methanol kg/hr MAX



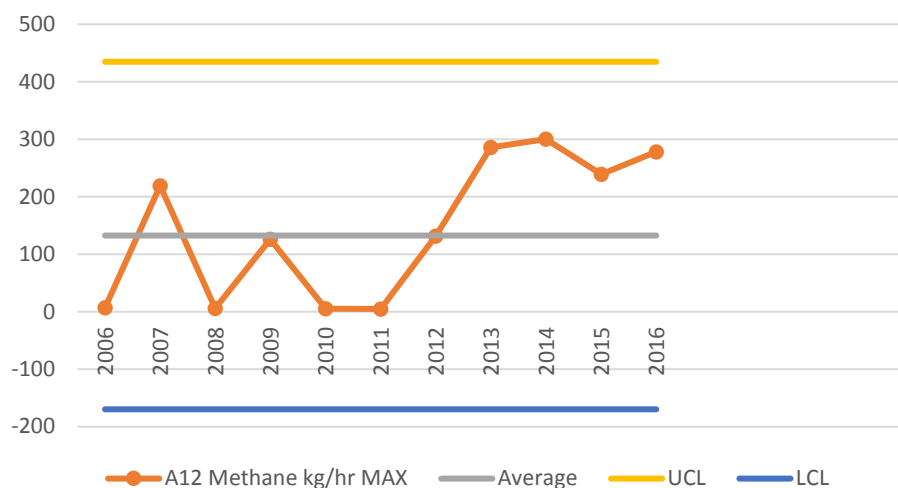
Results in control and within permit limit (max flow of 60kg/hr).

A34 Methanol kg/hr MAX



Results out of control and permit limit breached (max flow of 60kg/hr).  
Schedule 5 submitted retrospectively in April 2017.

A12 Methane kg/hr MAX



Results in control.

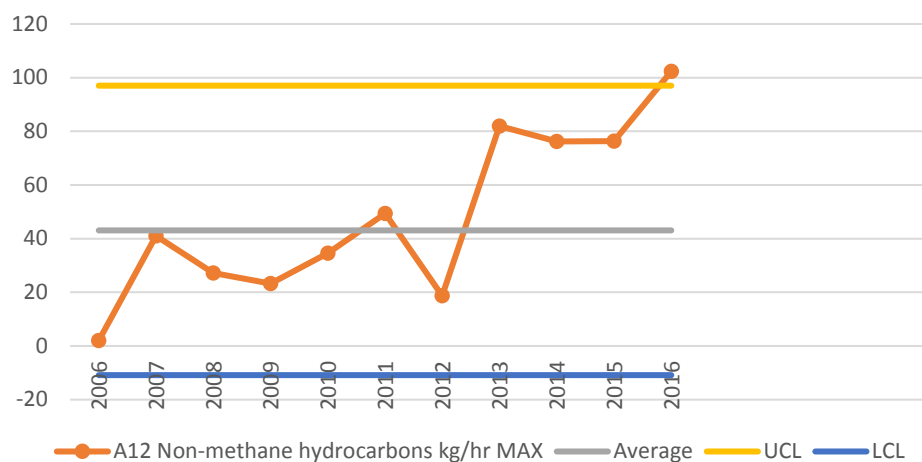


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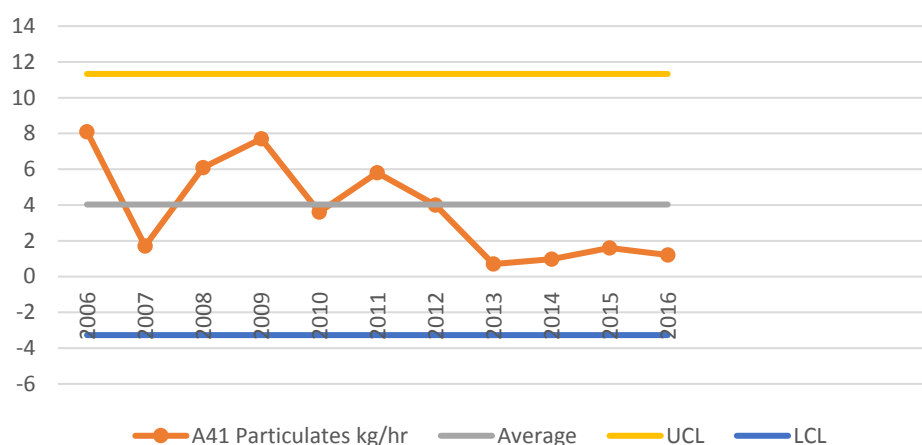
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### A12 Non-methane hydrocarbons kg/hr MAX



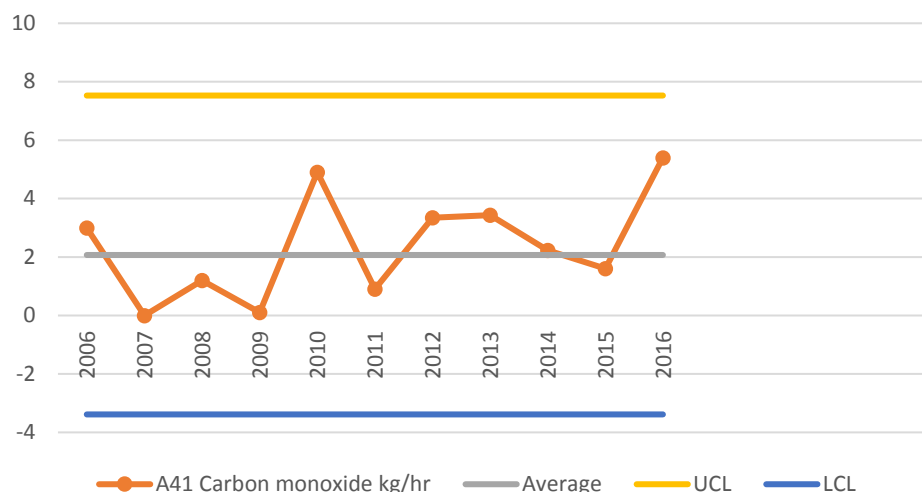
Result was just out of control high, the reason for this spike was a build up of hydrocarbons during the commissioning of the new W714 reactor. The result directly before and afterwards were almost zero.

### A41 Particulates kg/hr



Results in control and within permit limit (10 mg/m3).

### A41 Carbon monoxide kg/hr



Results in control and within permit limit (50mg/m3).

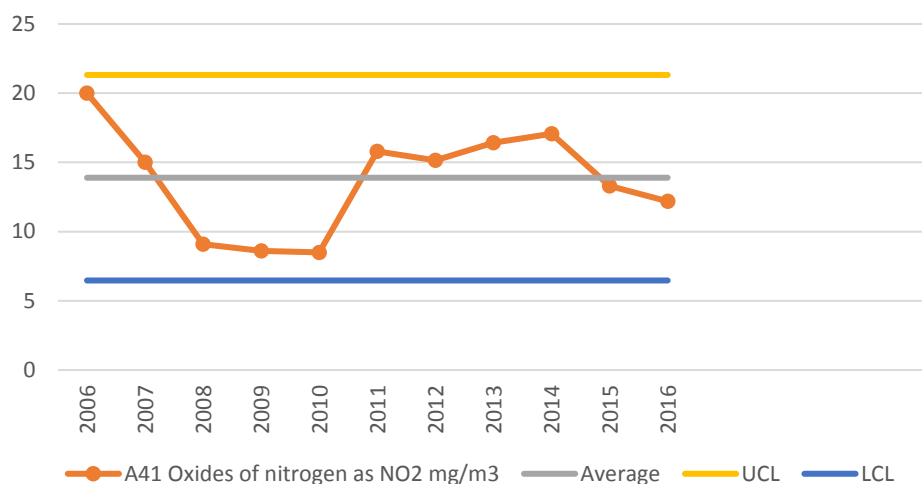


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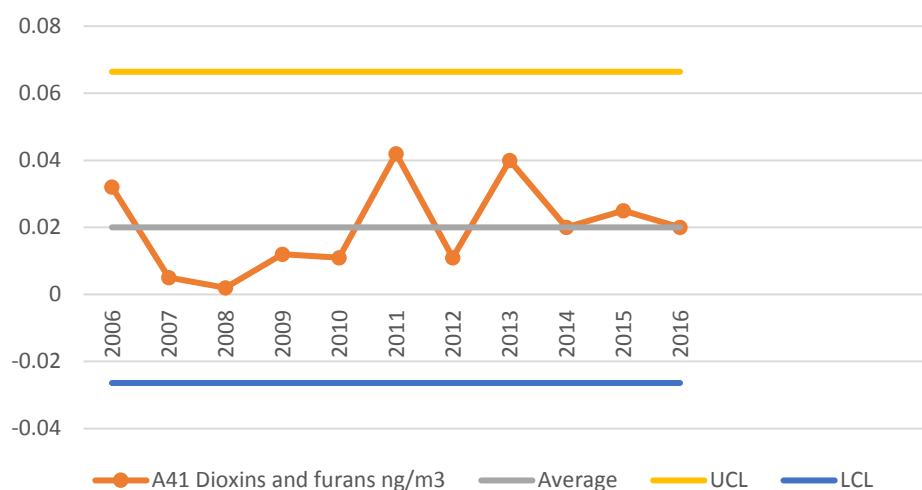
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A41 Oxides of nitrogen as NO<sub>2</sub> mg/m<sup>3</sup>



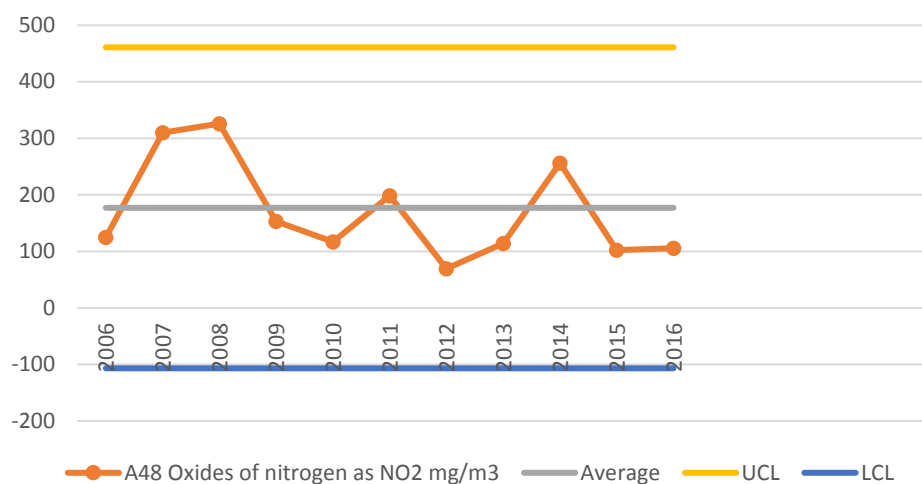
Results in control and within permit limit (100mg/m<sup>3</sup>).

A41 Dioxins and furans ng/m<sup>3</sup>



Results in control and within permit limit (0.1ng/m<sup>3</sup>).

A48 Oxides of nitrogen as NO<sub>2</sub> mg/m<sup>3</sup>



Results in control.

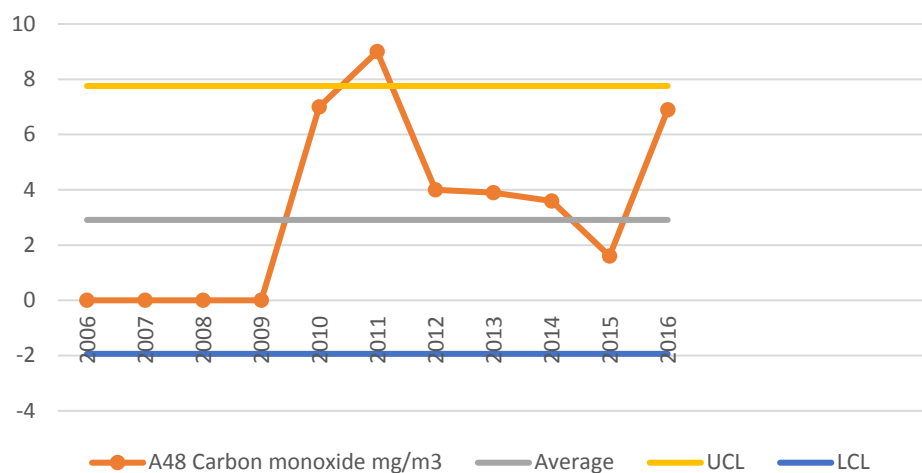


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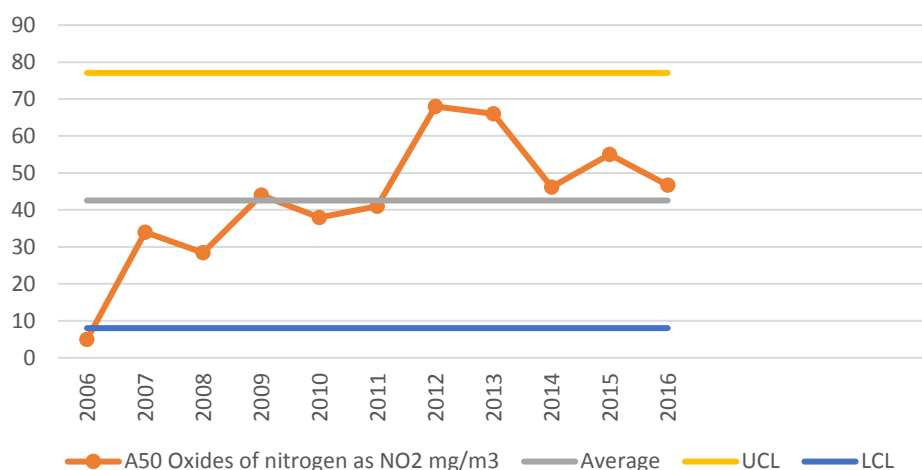
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A48 Carbon monoxide mg/m3



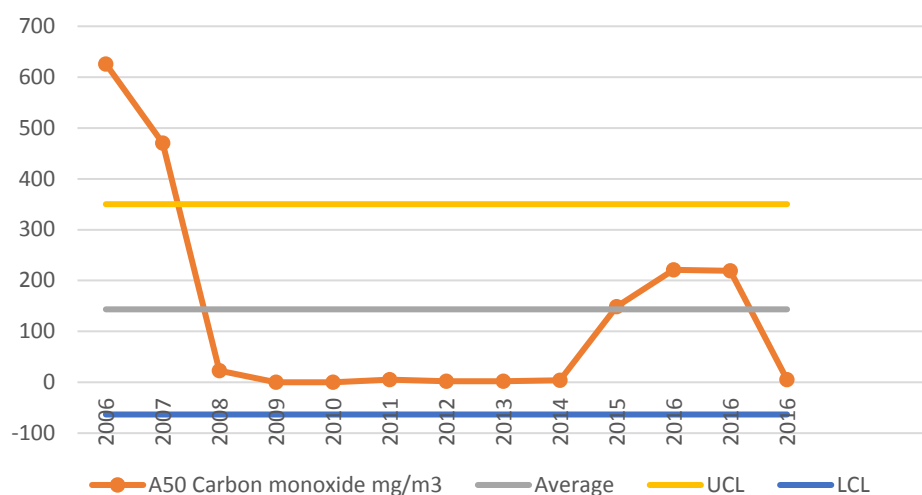
Results in control.

A50 Oxides of nitrogen as NO2 mg/m3



Results in control and within permit limit (200mg/m3).

A50 Carbon monoxide mg/m3



Results in control and within permit limit (200mg/m3).

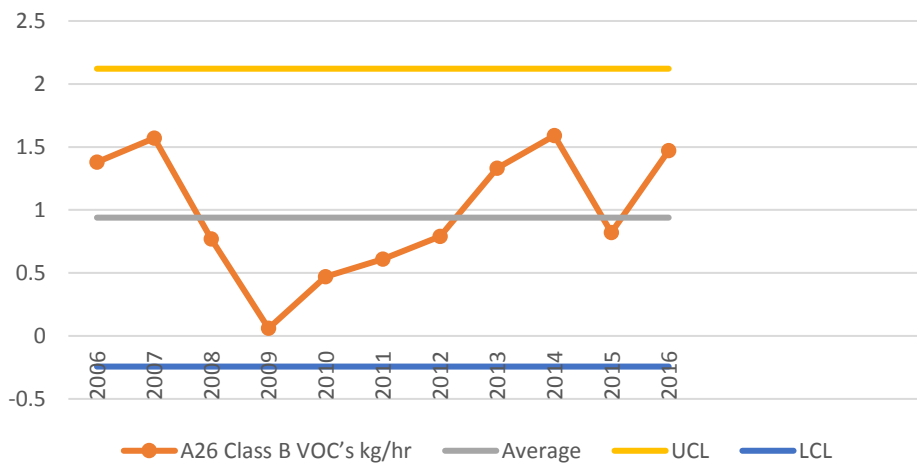


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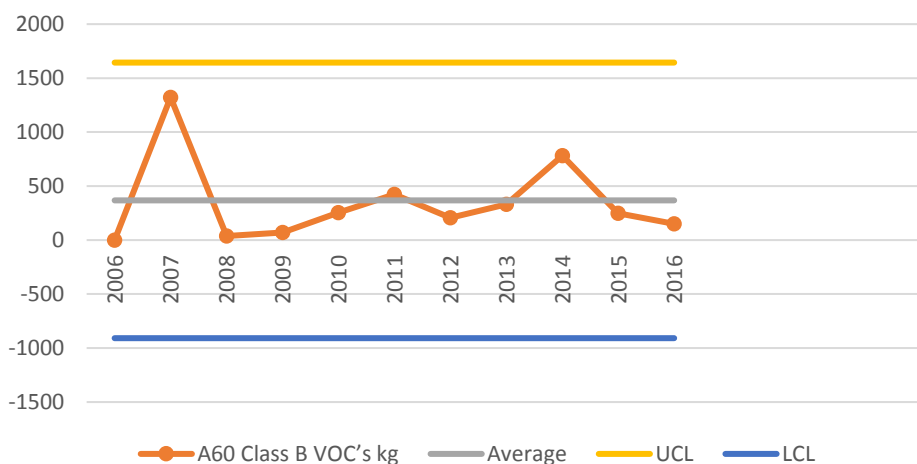
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A26 Class B VOC's kg/hr



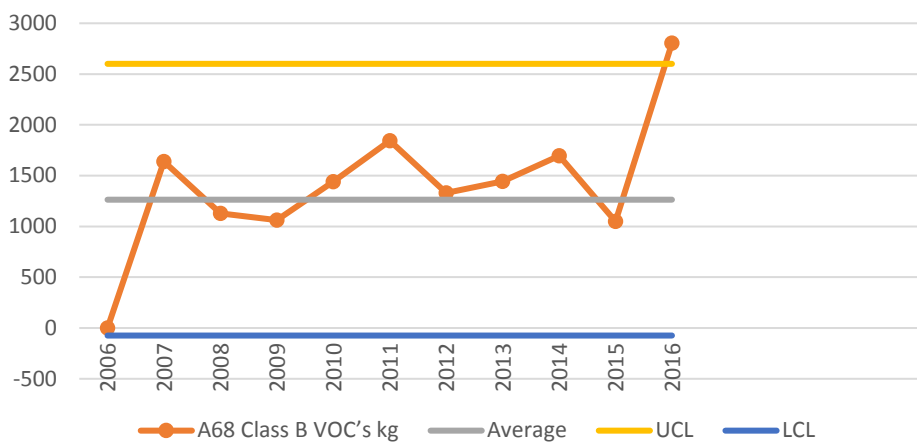
Results in control.

A60 Class B VOC's kg



Results in control and within  
permit limit (5,000 kg/yr).

A68 Class B VOC's kg



Results for 2016 just out of  
control high, but within  
permit limit (5,000 kg/yr).

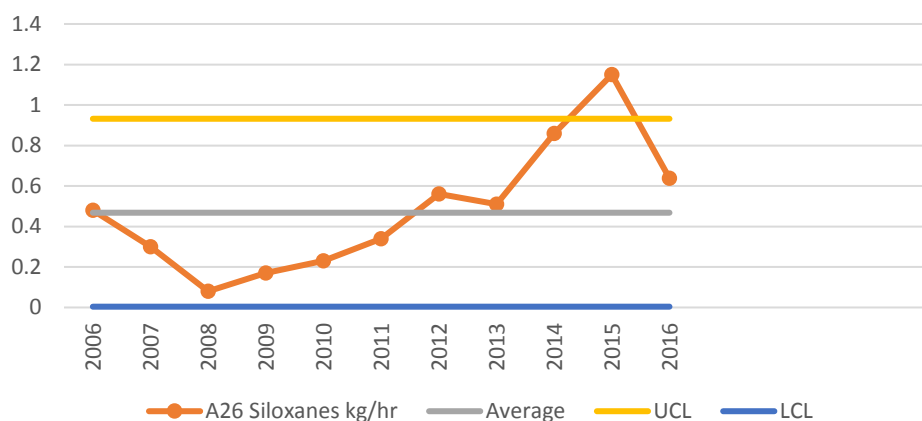


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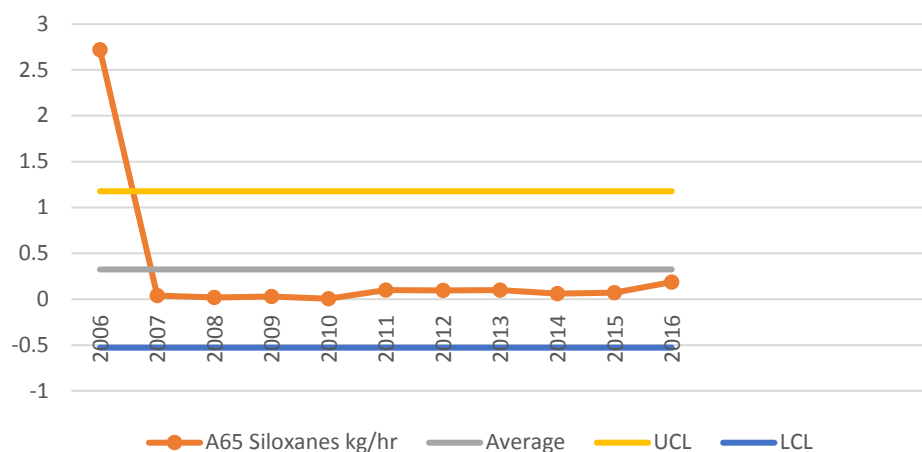
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A26 Siloxanes kg/hr



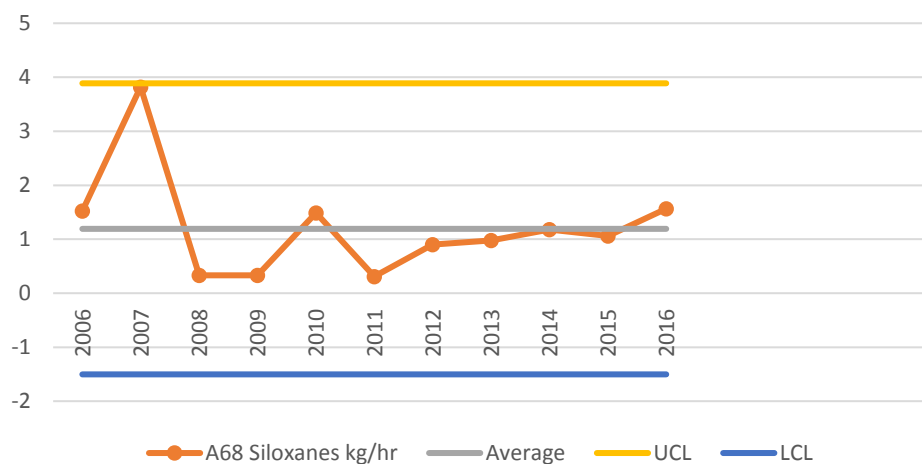
Results in control

A65 Siloxanes kg/hr



Results in control

A68 Siloxanes kg/hr



Results in control

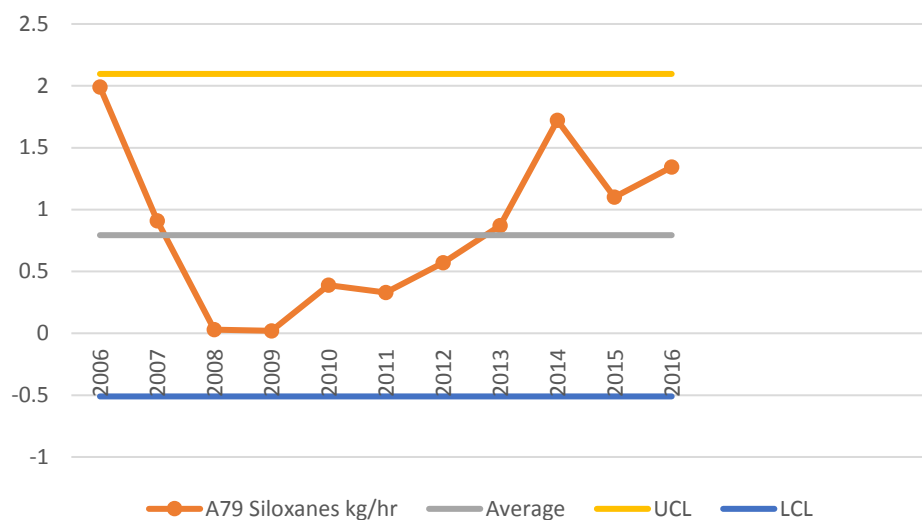


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A79 Siloxanes kg/hr

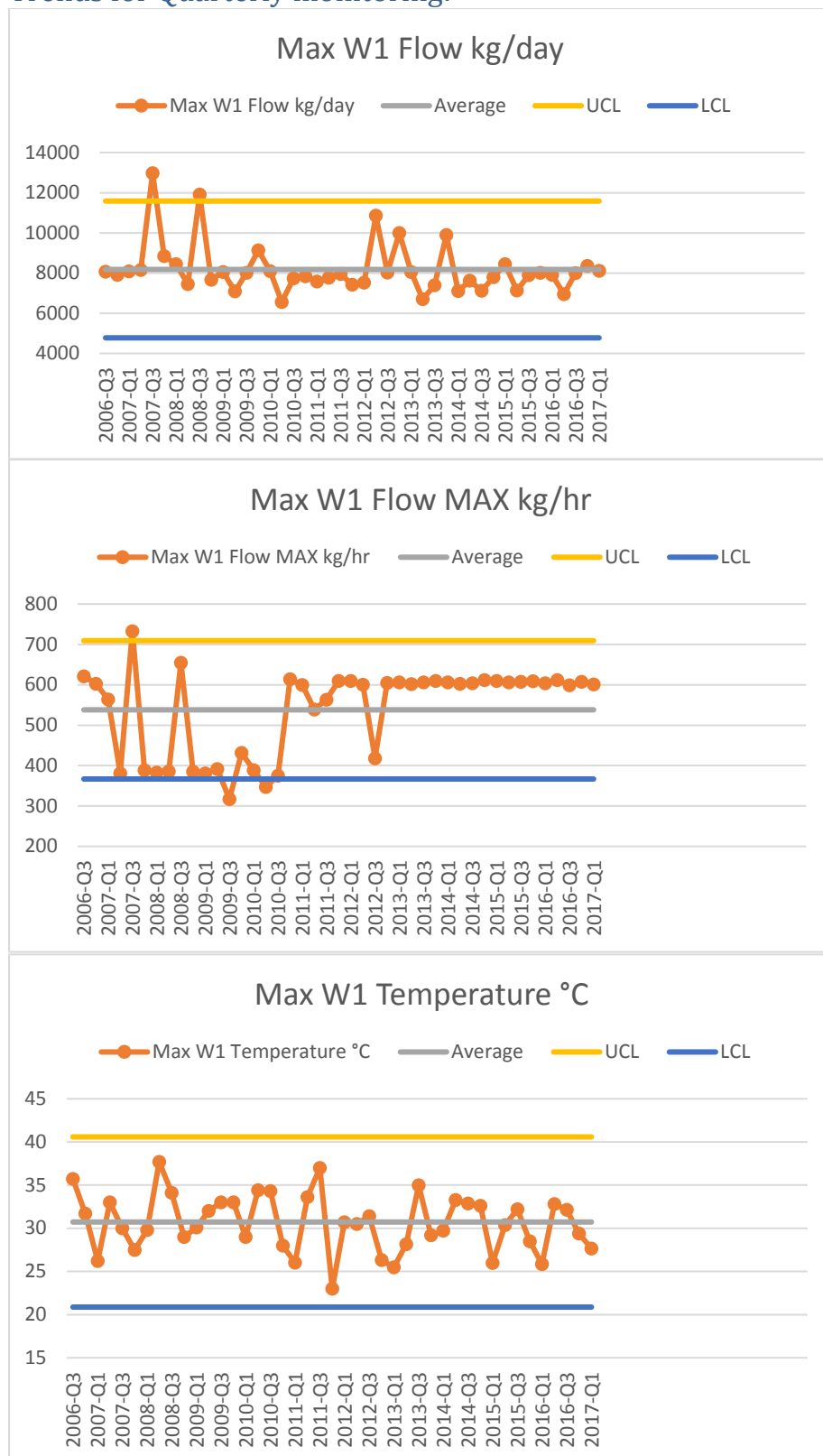


Results in control



## Water monitoring

### Trends for Quarterly monitoring:



Results in control and within permit limit (11,000 m<sup>3</sup>/day)

Results in control and within permit limit (625 m<sup>3</sup>/hr)

Results in control and within permit limit (40°C)

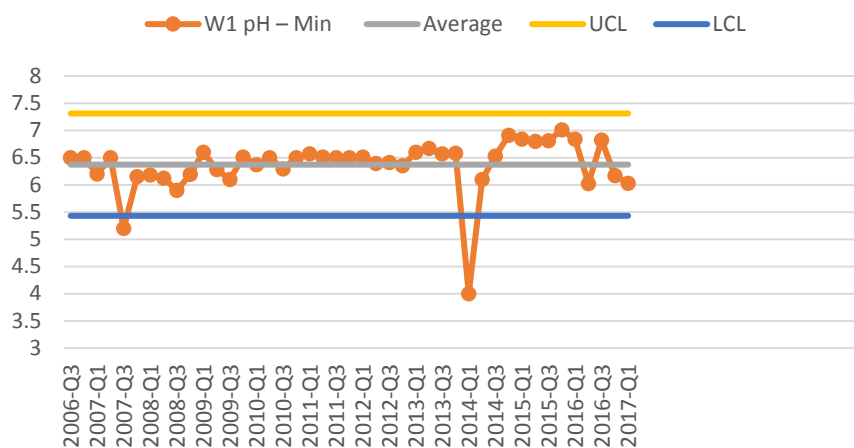


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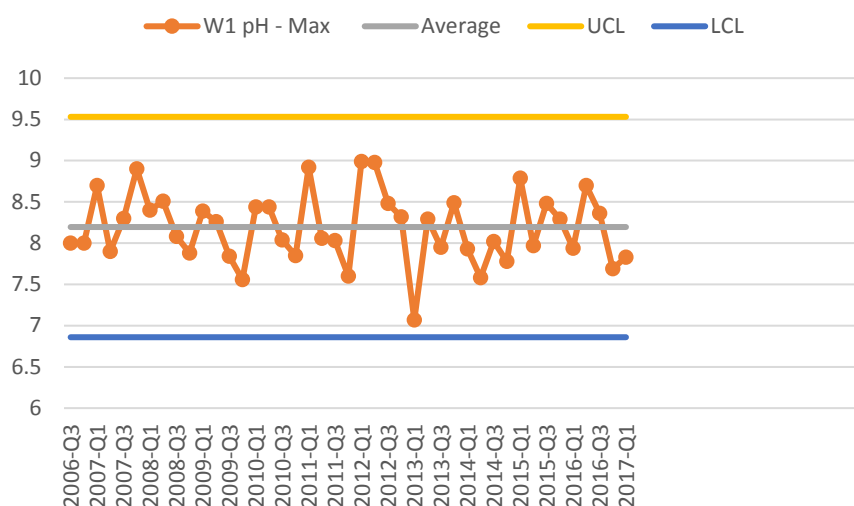
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W1 pH – Min



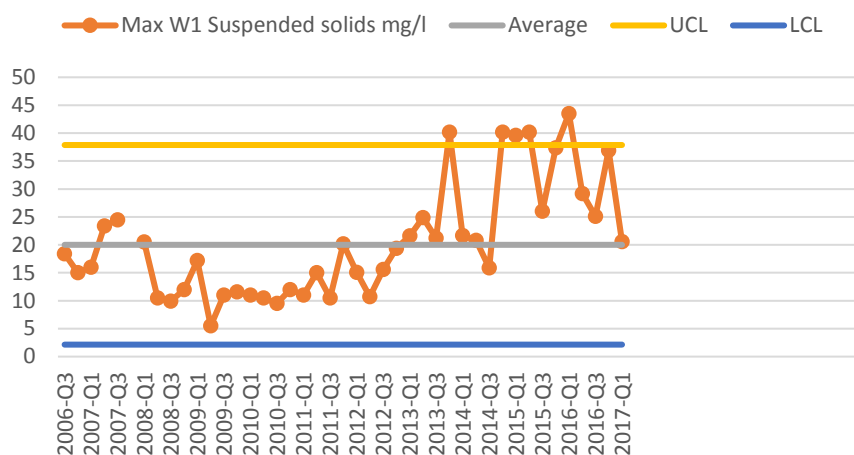
Results in control and within  
permit limit (>6)

W1 pH - Max



Results in control and within  
permit limit (<9)

Max W1 Suspended solids mg/l



Results in control and within  
permit limit (30 mg/l)

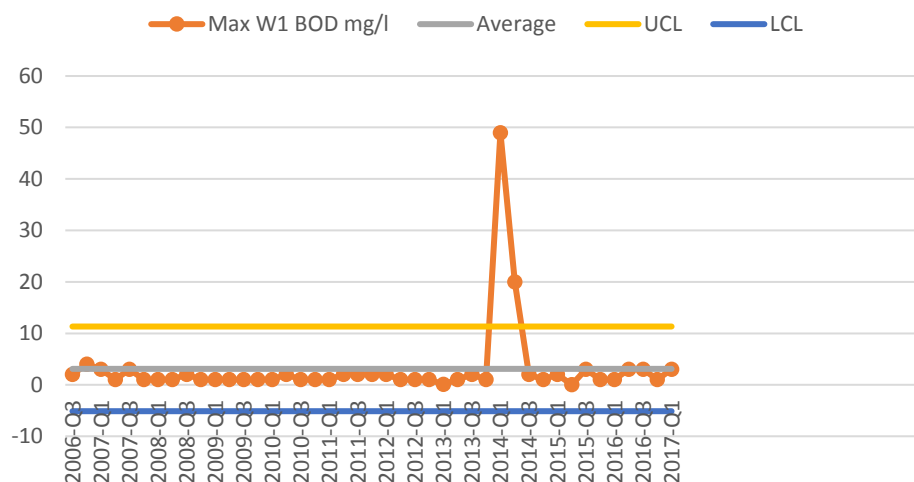


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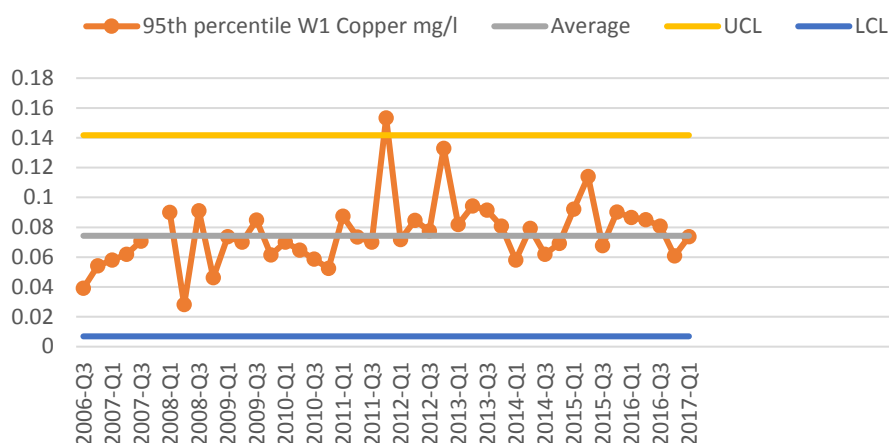
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Max W1 BOD mg/l



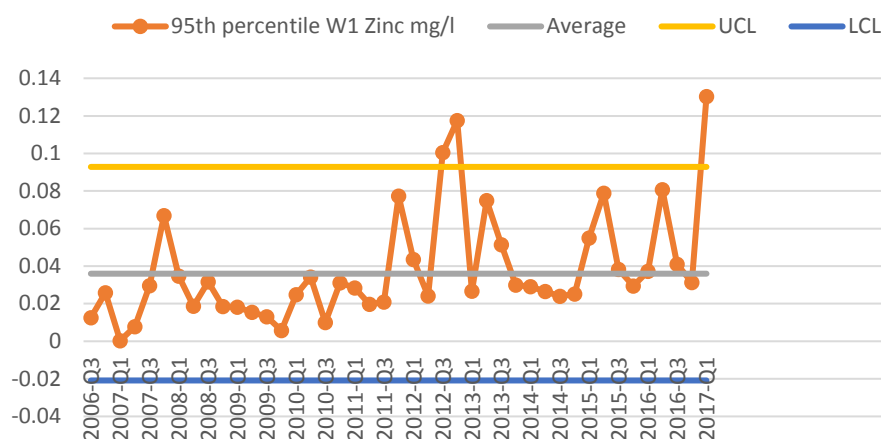
Results in control and within  
permit limit (20 mg/l)

95th percentile W1 Copper mg/l



Results in control and within  
permit limit (0.1 mg/l)

95th percentile W1 Zinc mg/l



Q4 result out of control high,  
but well within permit limit  
(0.5 mg/l)

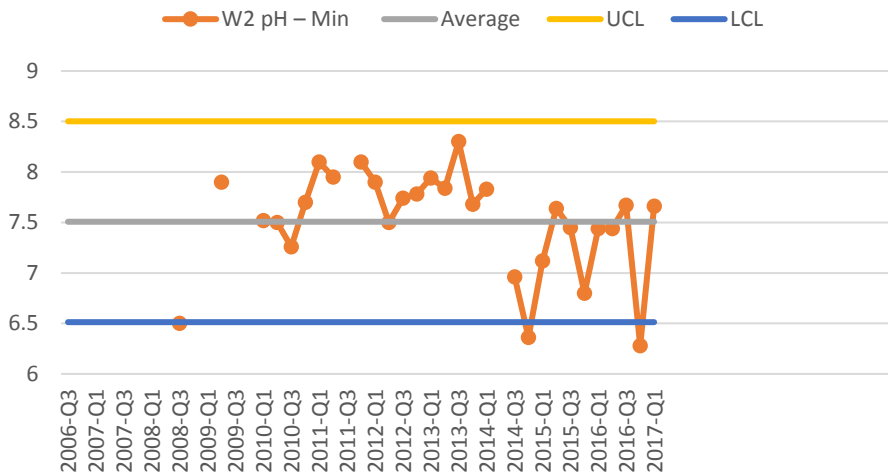


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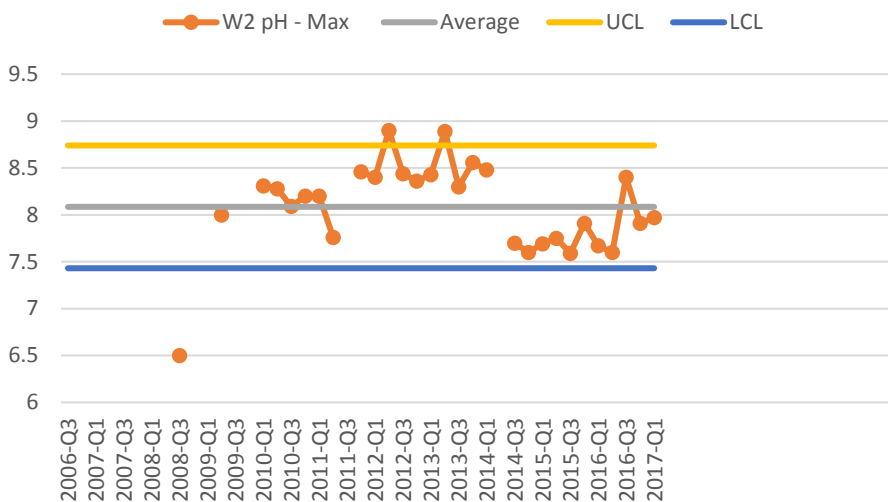
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W2 pH – Min



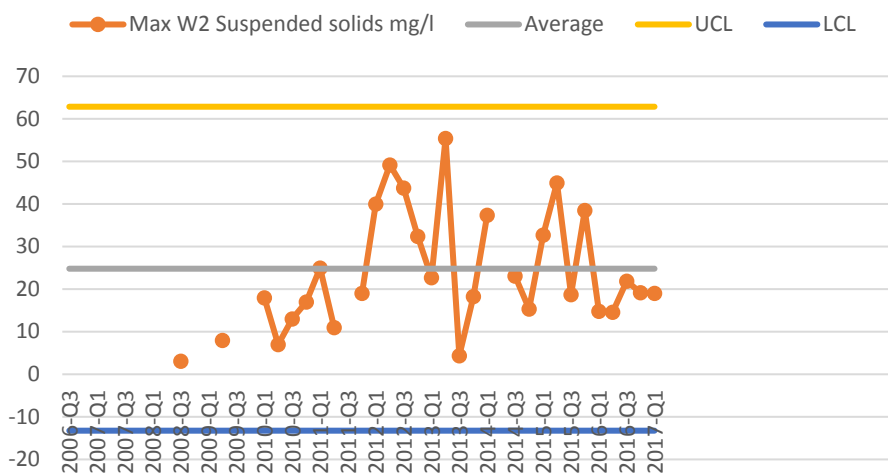
Results in control and within  
permit limit (>6)

W2 pH - Max



Results in control and within  
permit limit (<9)

Max W2 Suspended solids mg/l



Results in control and within  
permit limit (30 mg/l)

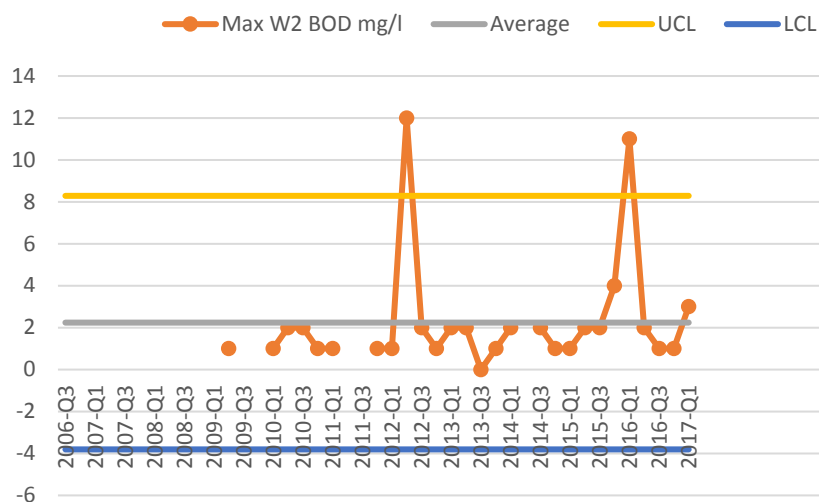


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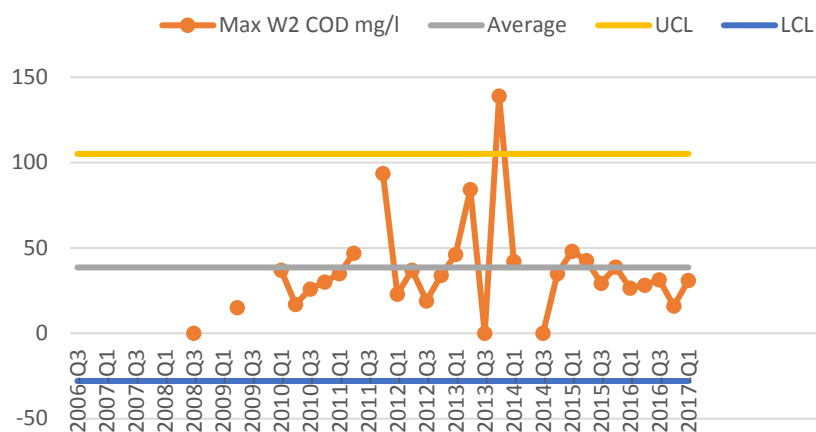
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### Max W2 BOD mg/l



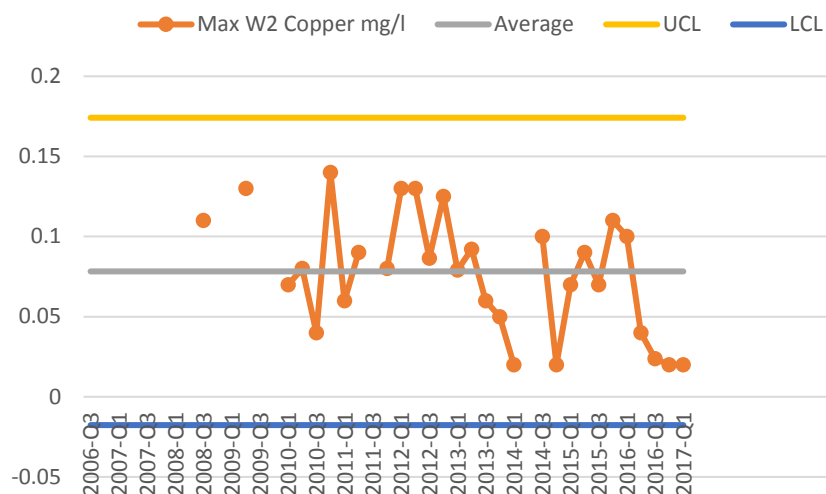
Results in control and within  
permit limit (20 mg/l)

### Max W2 COD mg/l



Results in control and within  
permit limit (125 mg/l)

### Max W2 Copper mg/l



Results in control and within  
permit limit (0.15 mg/l)

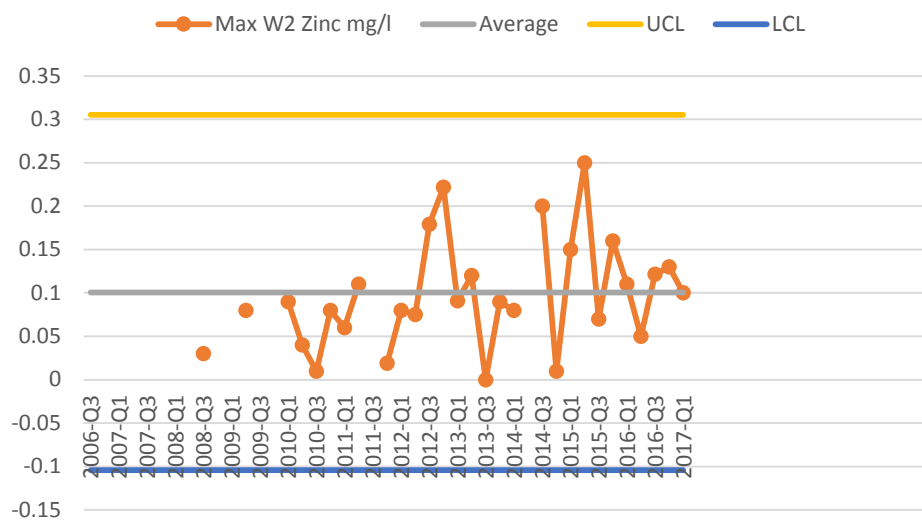


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Max W2 Zinc mg/l

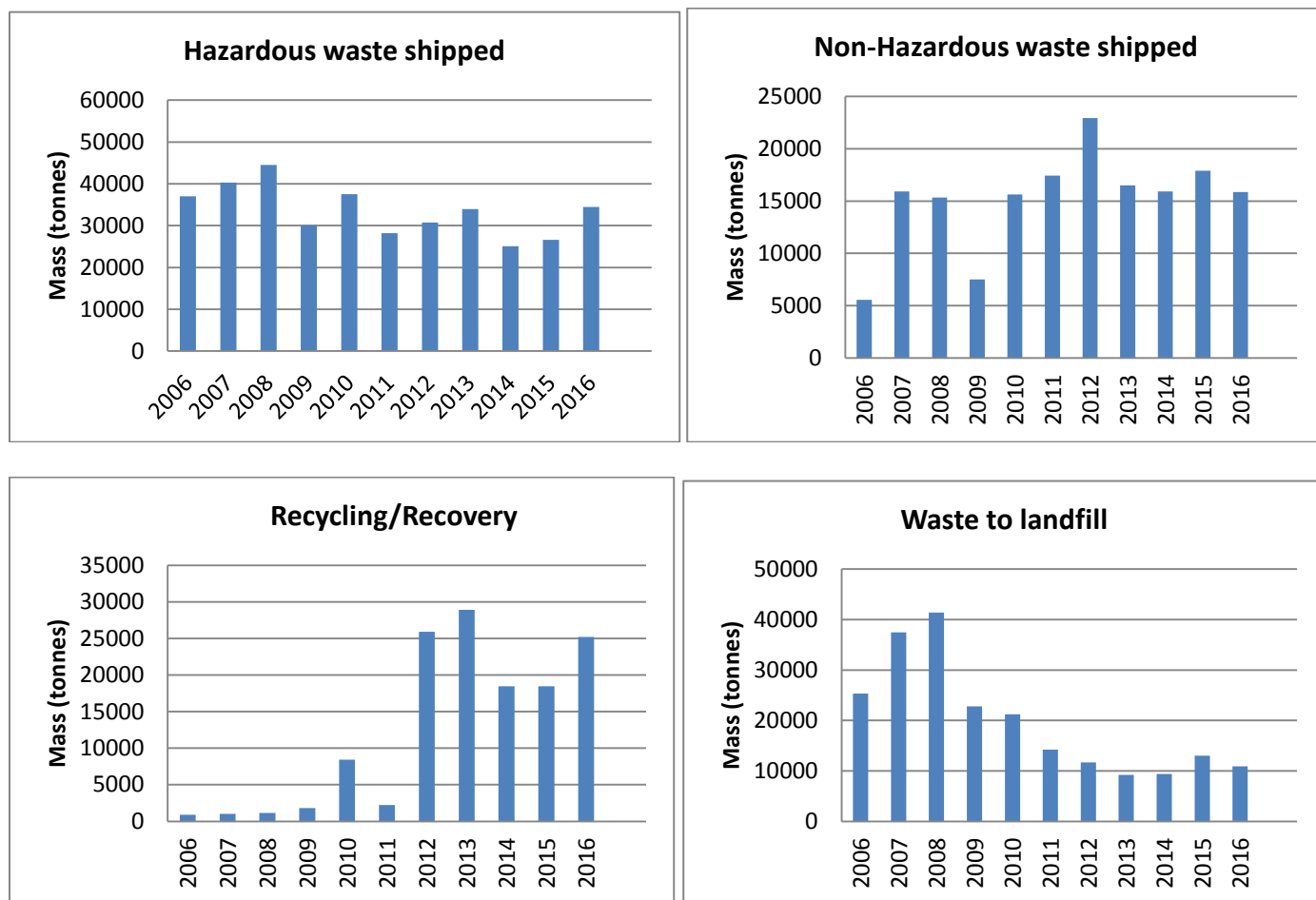


Results in control and within  
permit limit (0.25 mg/l)

|                                                                                                                                                                     |                                                                          |                      |
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## Waste

Waste shipped from the site was as follows:



The increase in hazardous waste shipping during 2016 was reducing the stockpile of DPR to allow the old site landfill to be closed. This also reflects in the Recycling graph.

|                                                                                   |                                                                          |                      |
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## Complaints

There were 13 complaints to the Barry Industrial complex helpline in 2016.

- 4 were for odour - None of the odour complaints were attributed to Dow Corning
- 8 were for noise –
  - 4 of the noise complaints were attributed to Dow Corning.
    - 3 related to jetting activity during the site shutdown. This was stopped until noise mitigation was put in place.
    - 1 related to start up of a turbine at Engie.
- 1 was a follow up of a previous complaint regarding dust, which was in process of being followed up by NRW. This complaint could not be attributed to Dow Corning