Scottish Government
Seafield WwTW Strategic Odour Review

Draft Report Briefing

Friday 27th October 2017

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Phil Longhurst

…measure it.. manage it…!

The authors wish to express their gratitude for the assistance received from stakeholders during this strategic review. The compilation of this report has been facilitated by the time given, opinions expressed, experiences recounted and co-operation freely offered by people in Leith and Edinburgh. This includes residents of the Leith and Leith Links areas, members of the Leith Links Residents Association, Leith Community Council, local businesses, officers from City of Edinburgh Council and SEPA, City of Edinburgh Council Members and the MSP for Edinburgh Northern and Leith. We are also grateful for the assistance received from personnel of Scottish Water, Stirling Water, Veolia and the Scottish Government for their co-operation and provision of factual information.

Alun McIntyre

Amec Foster Wheeler

Professor Phil Longhurst

Cranfield University

"…the first essential step in the direction of learning any subject is to find principles of numerical reckoning…

…when you can measure what you are speaking about…, you know something about it;

…when you cannot measure it, when you cannot express it in numbers, your knowledge is of a meagre and unsatisfactory kind…, whatever the matter may be."

Lord Kelvin

Contents

Part 1: What we did and found, Q&A

Part 2: Summary Report Issue, Recommendations, Q&A

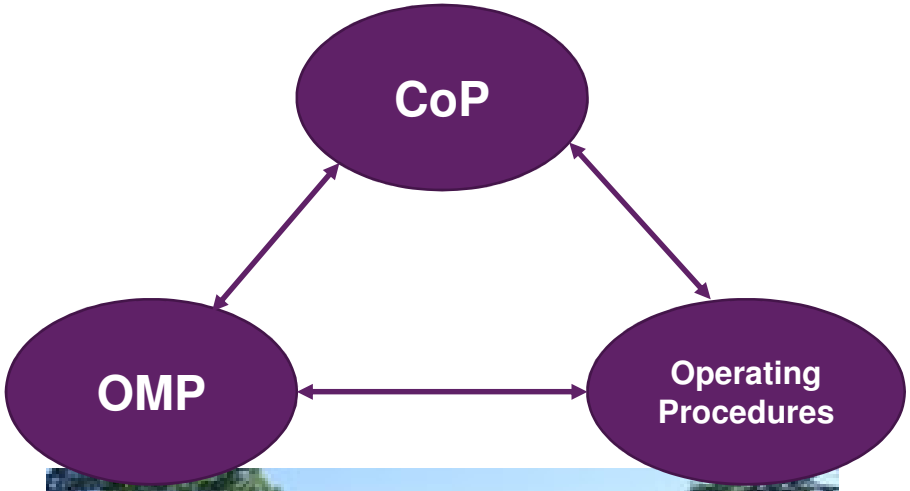
The review has two evidence-based themes in relation to odour generation and minimisation:

a) **Evaluation of the performance and operation of the sewerage network and WwTW; and**

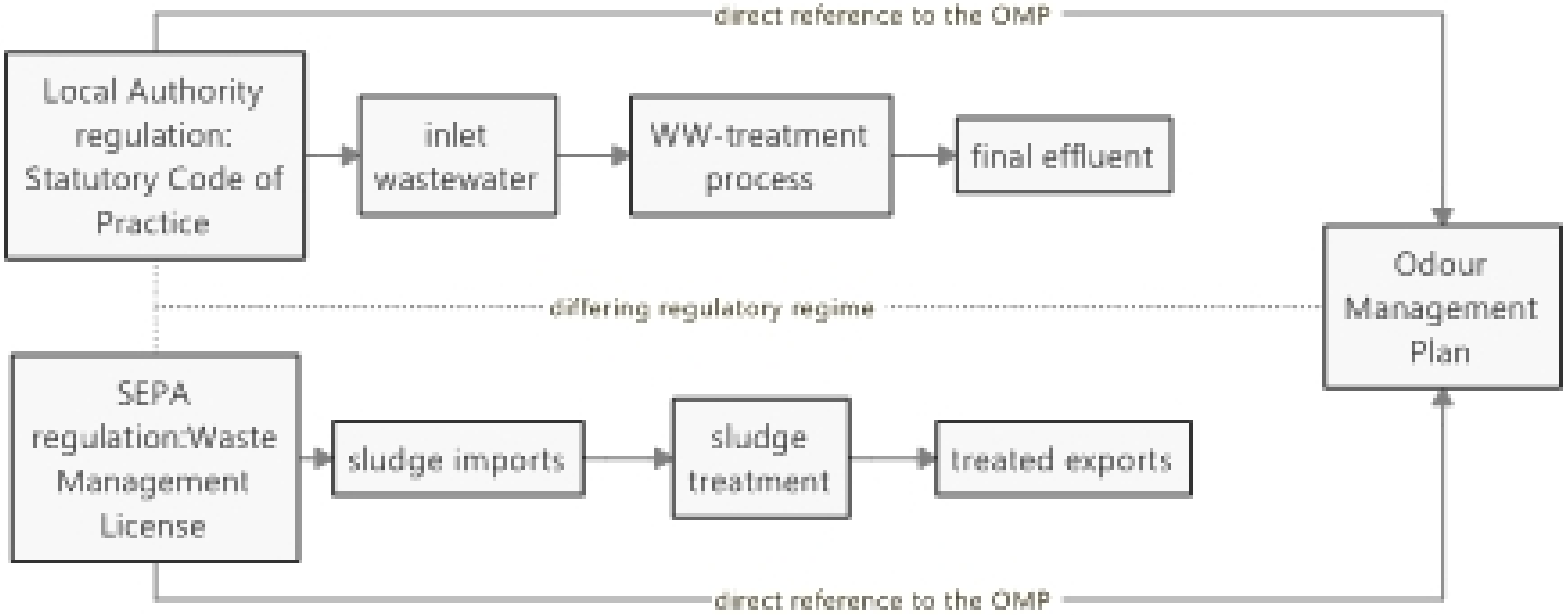
b) **Engagement with stakeholders to elicit information on how odour from Seafield WwTW affects their lives.**

What we did and found

- **Reviewed the role of the CoP, OMP and ops. procedures**
  - Looking at the links between each, and
  - Regulation using bpm & WML
- **Met with stakeholders across 8x groups and discussed 5x main themes**
  - Residence and experience of odour
  - Detection & problems from Seafield
  - Experience of impact from odours
  - Experience of the complaints system & reporting
  - Experience and expectations of improvement



Dual regulation



- **The local authority regulates the process elements of the site against the OMP to prevent nuisance off-site, using bpm**
- **SEPA regulates the import and processing of sludge with a WML, referring to the OMP to control odours**

Meetings with stakeholders

- **Odour from Seafield has been a significant concern for a long period. Improvements from the implementation of the OIP (2008) achieved a notable reduction. However, exposure to odours persists**
- **Experience varies greatly on the extent of improvement from the site prior to and since the OIP**
- **In general, a significant reduction was noted since the OIP, yet ongoing odours persist from weather conditions and specific incidents**

Impacts can be significant, from;

- High intensity emission 'events'
- Ongoing uncertainty and less intense odours affecting amenity

- **Complaint reporting is in place and in general the process of local authority investigation understood.**
- Yet this is a slow process with split responsibility and little expectation of change

Meetings with stakeholders

…when asked about what would be recognised as improvement, 'no odour' was a common statement.

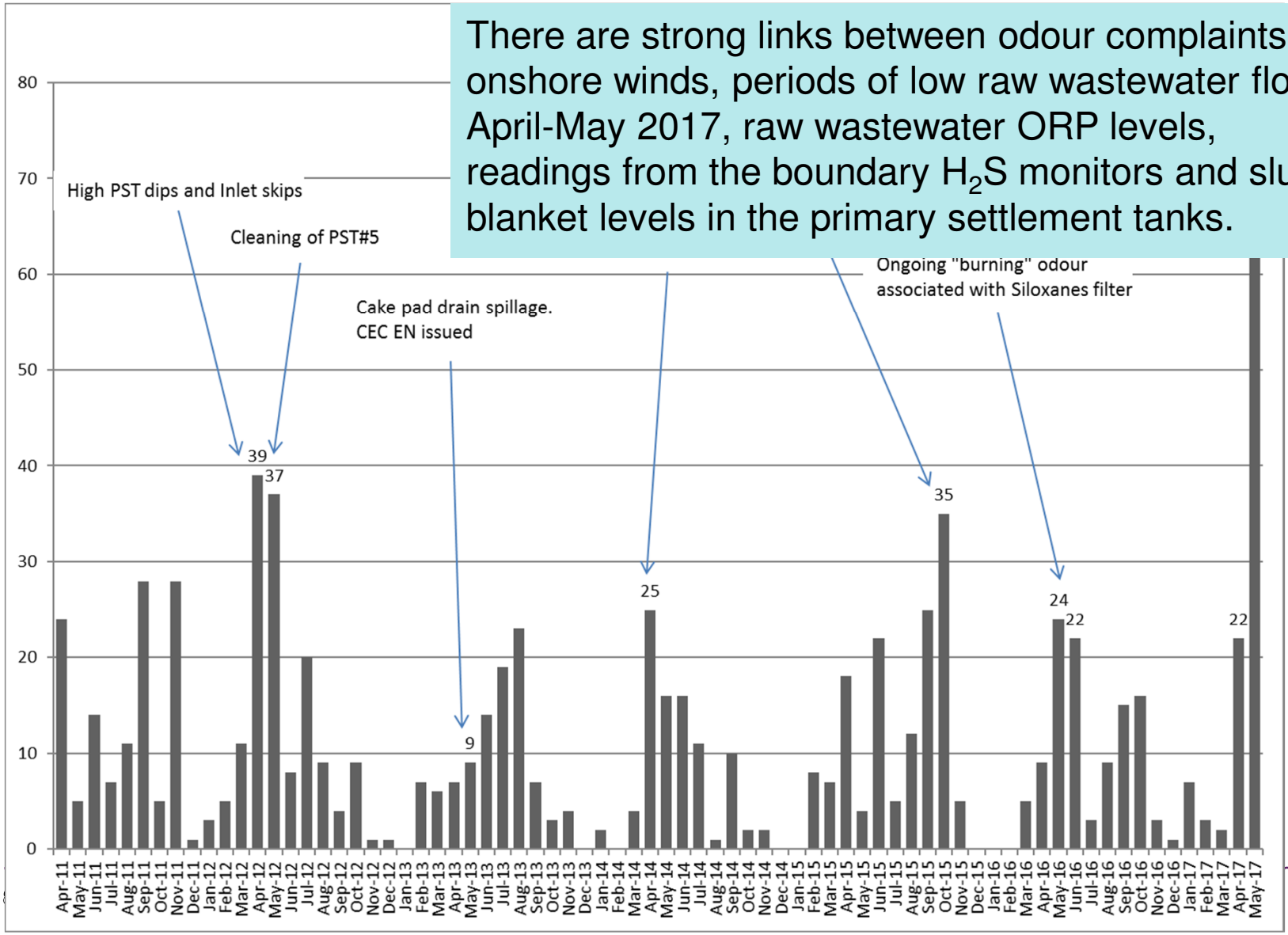
Also, 'a marked difference from low-level persistent odours and control over major incidents would be noticed.'

The Leith Links area, park and allotments are valued greatly. These provides opportunities for sport, recreation, and community within a densely populated area.

from: Leith Links award (2014)

Complaints analysis

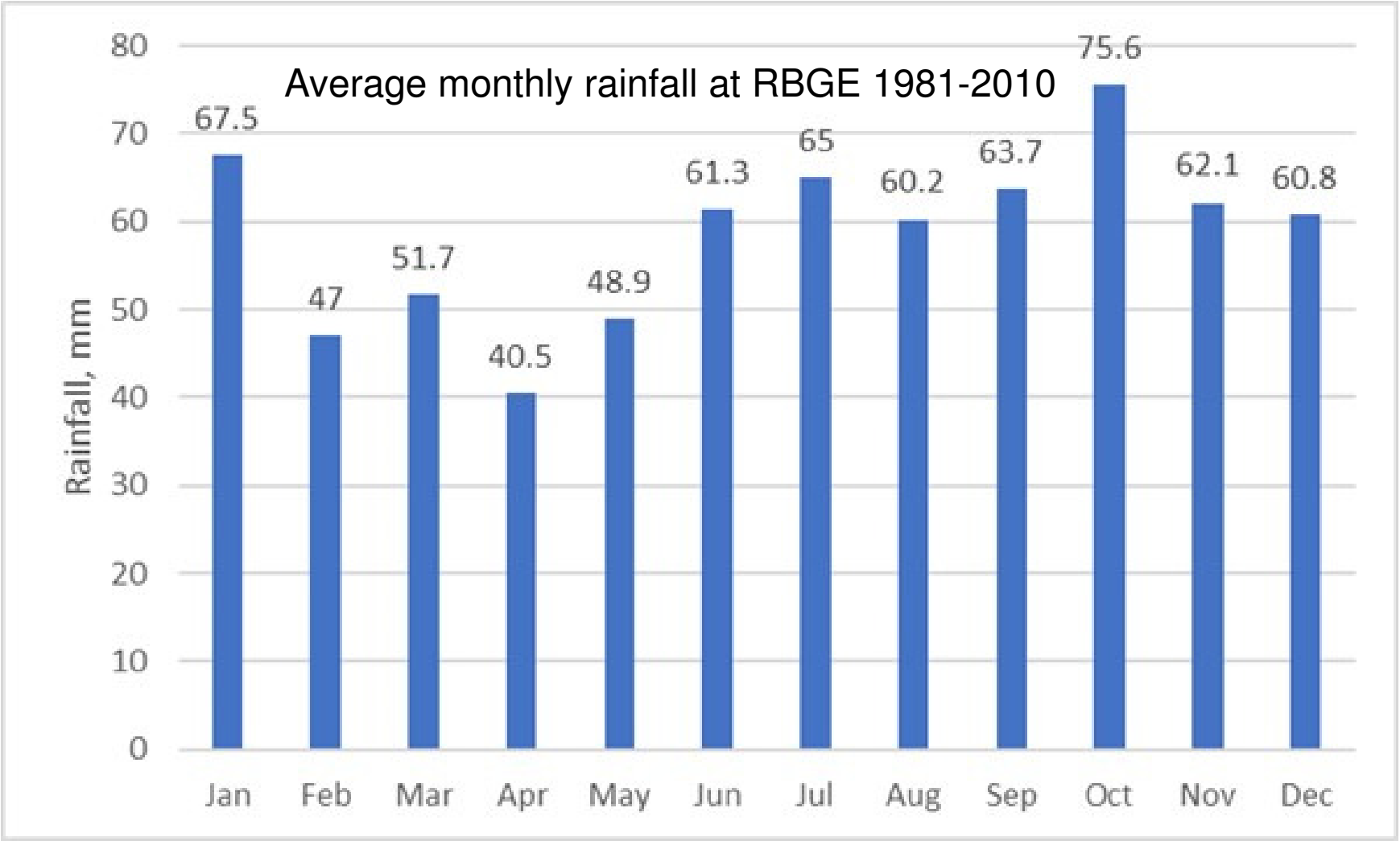
There are strong links between odour complaints, onshore winds, periods of low raw wastewater flow in April-May 2017, raw wastewater ORP levels, readings from the boundary H_2S monitors and sludge blanket levels in the primary settlement tanks.



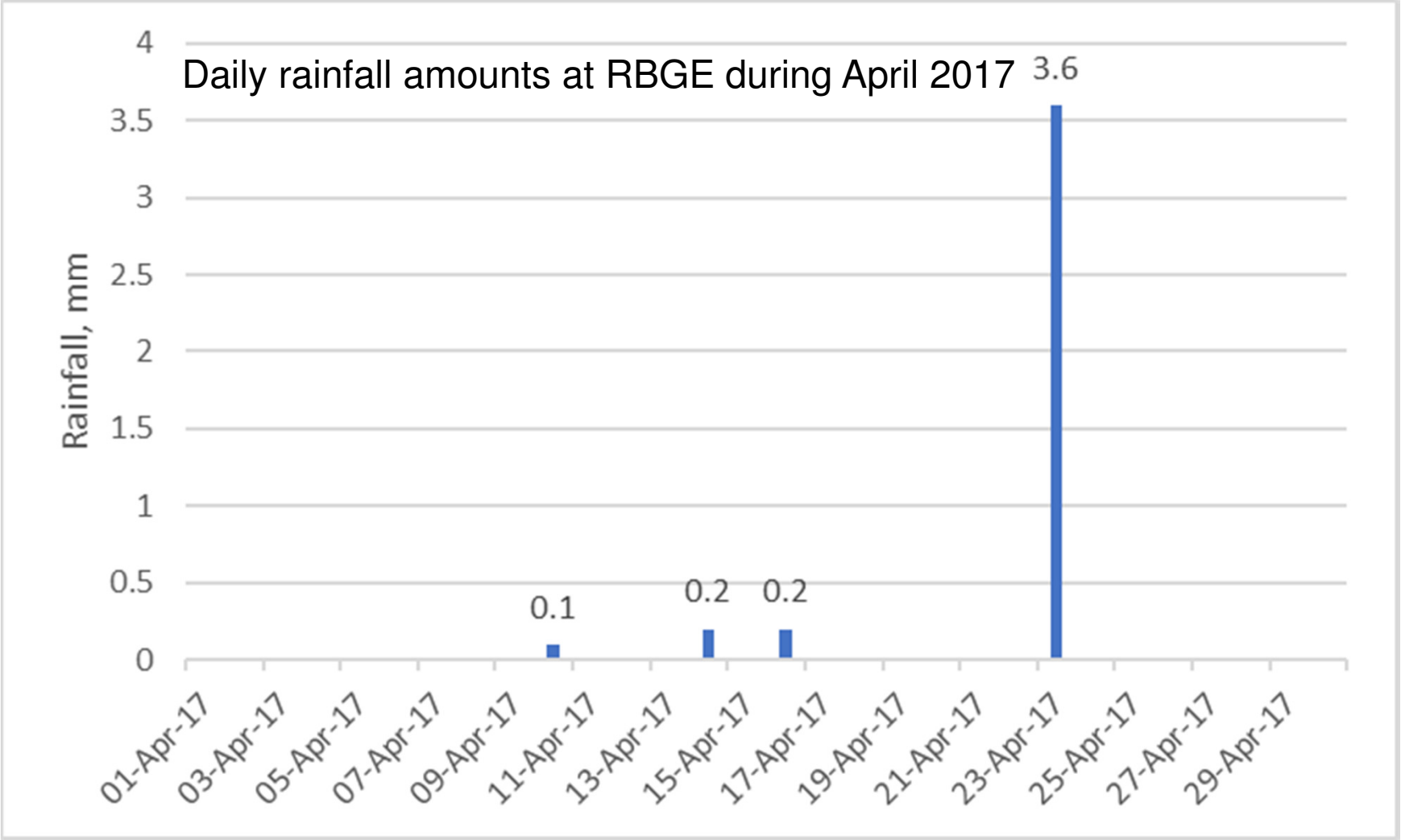
Technical investigation

- **Raw wastewater flows;**
- **Raw wastewater quality;**
- **Sludge PST levels;**
- **Boundary odour monitoring of hydrogen sulphide;**
- **Sewer network characteristics;**
- **Trade effluent discharges;**
- **Odour emissions from unit processes;**
- **Prevailing weather conditions;**
- **Dispersion modelling to assess the impacts of odour emissions;**
- **Sludge management & handling; and**
- **Storm tanks**

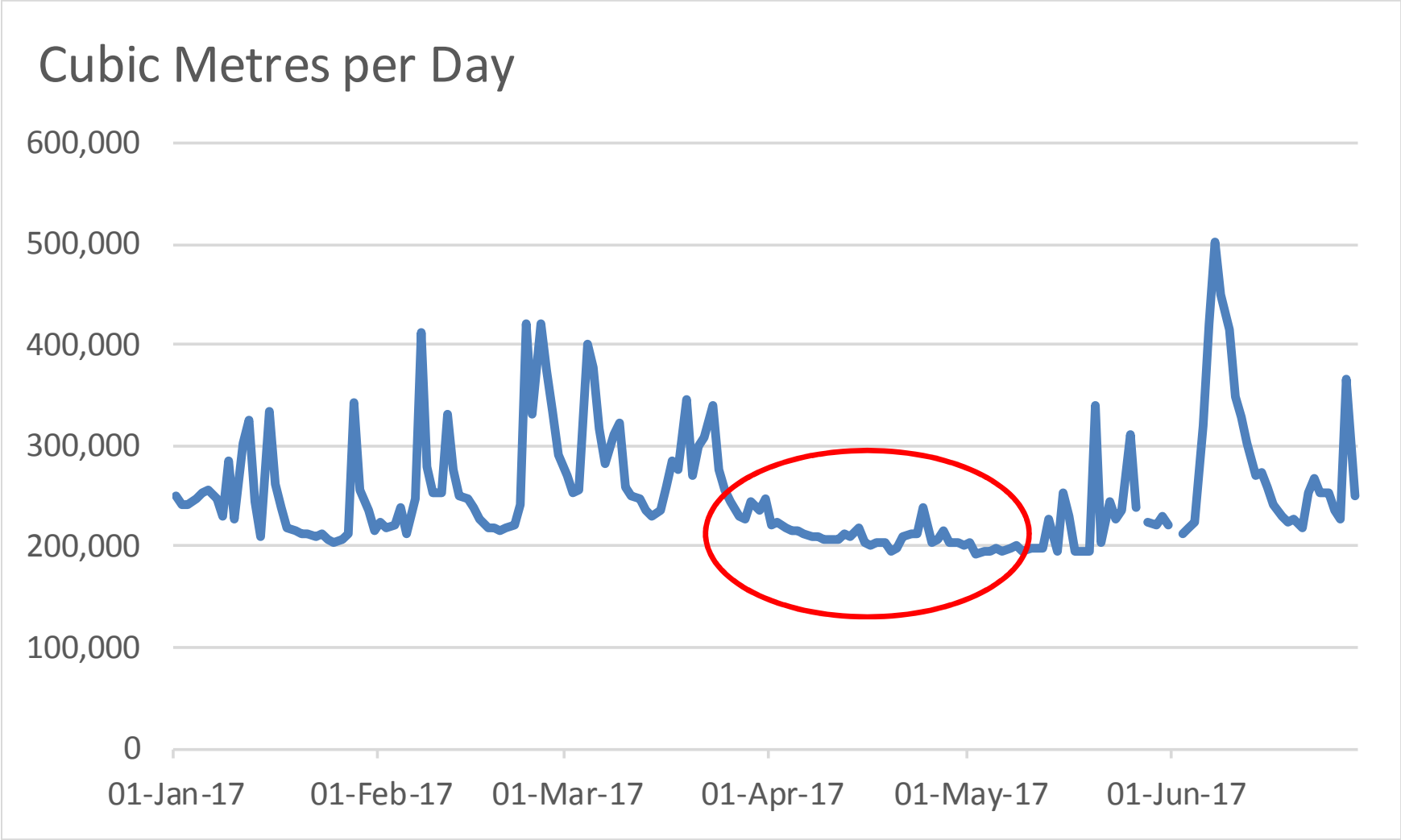
Raw wastewater flows



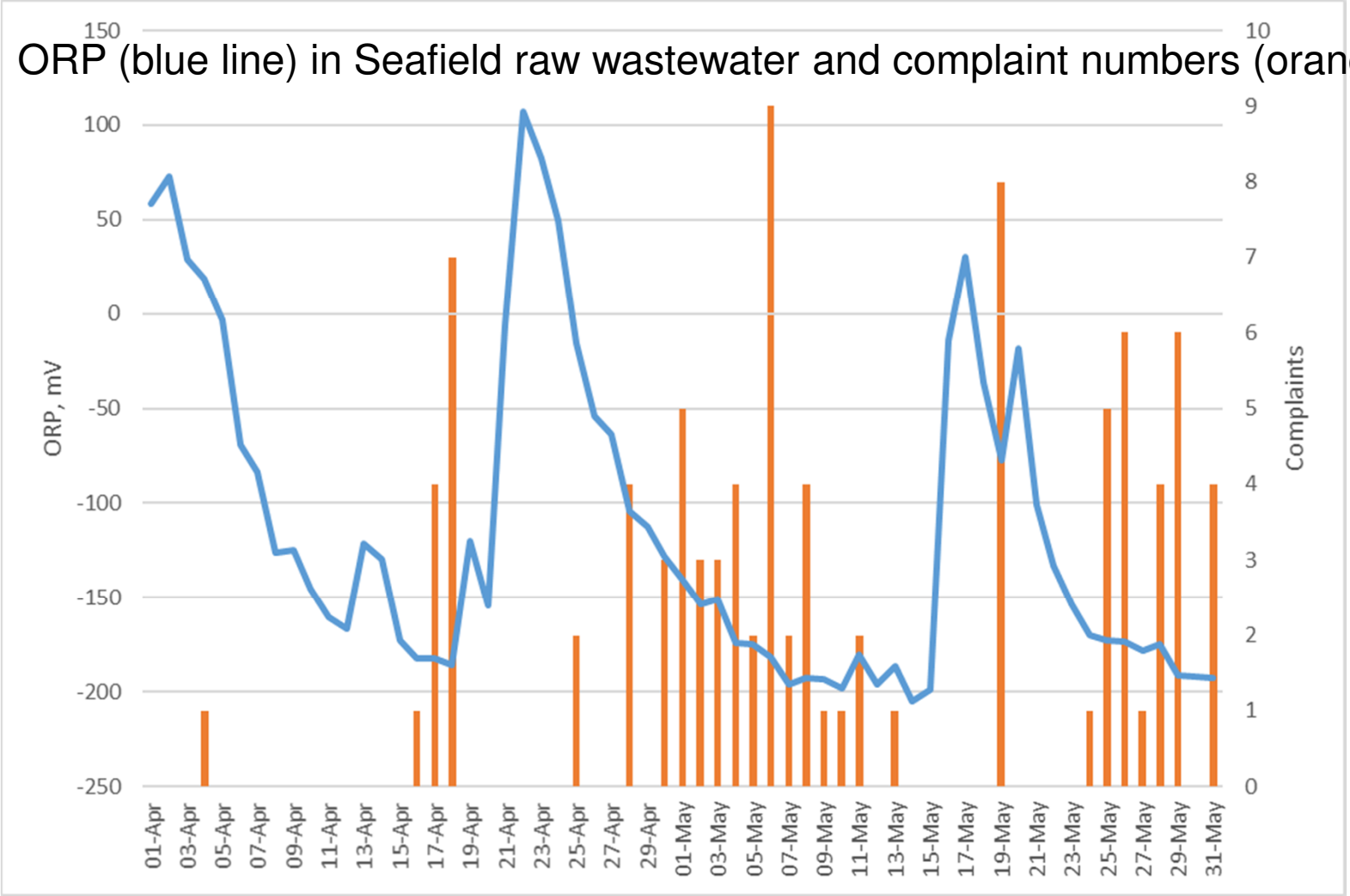
Raw wastewater flows



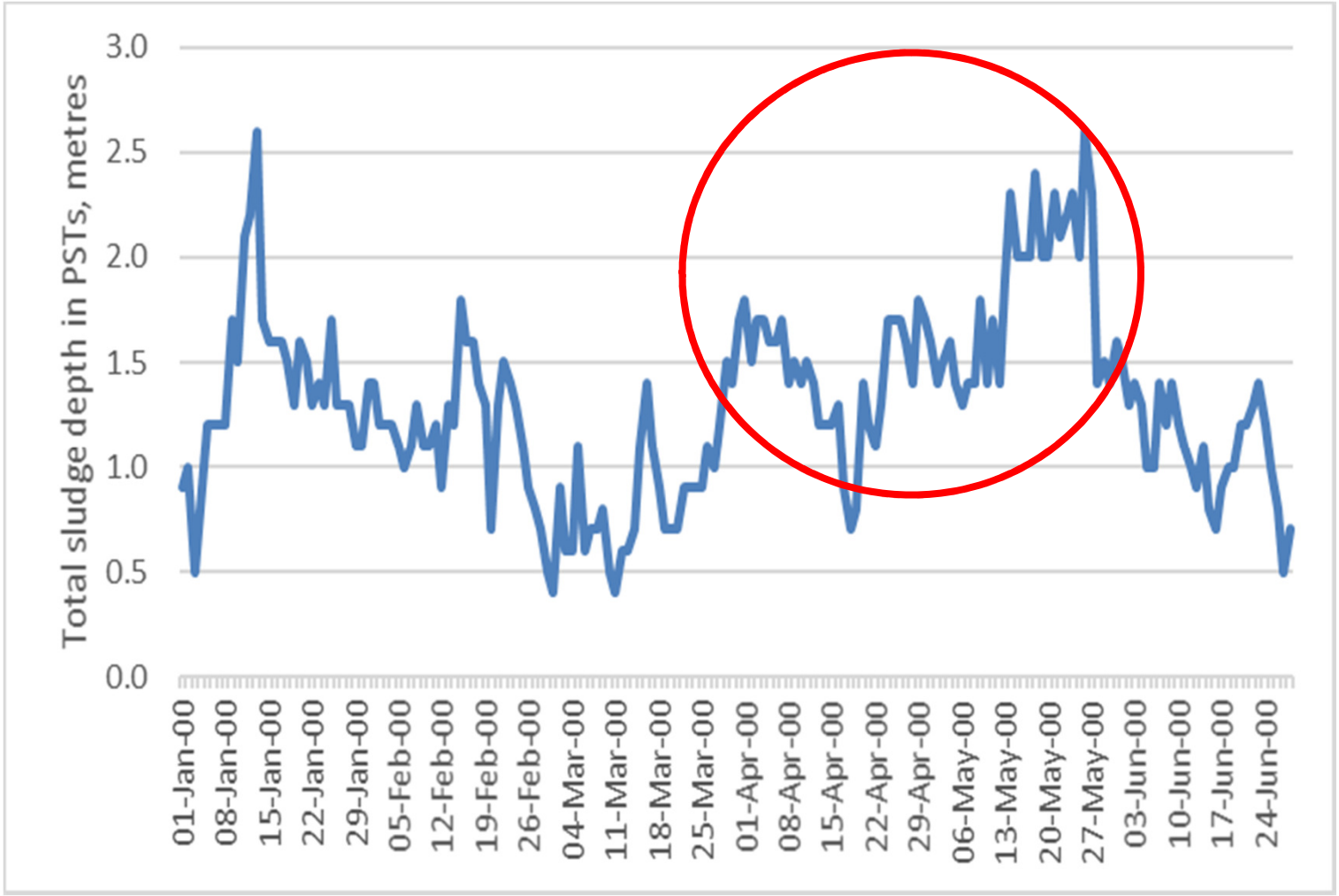
Raw wastewater flows



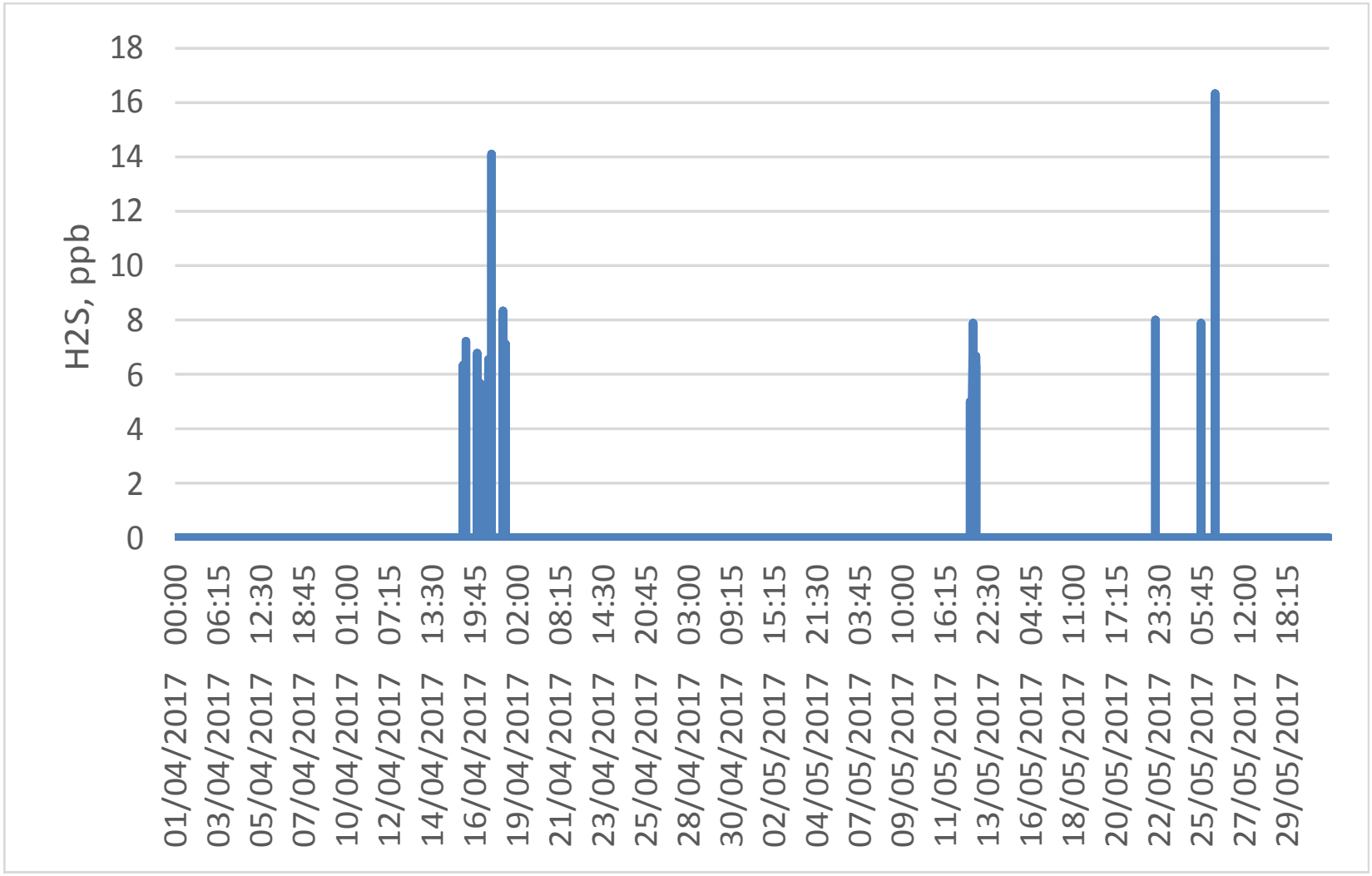
Raw wastewater flows (Apr/May 2017)



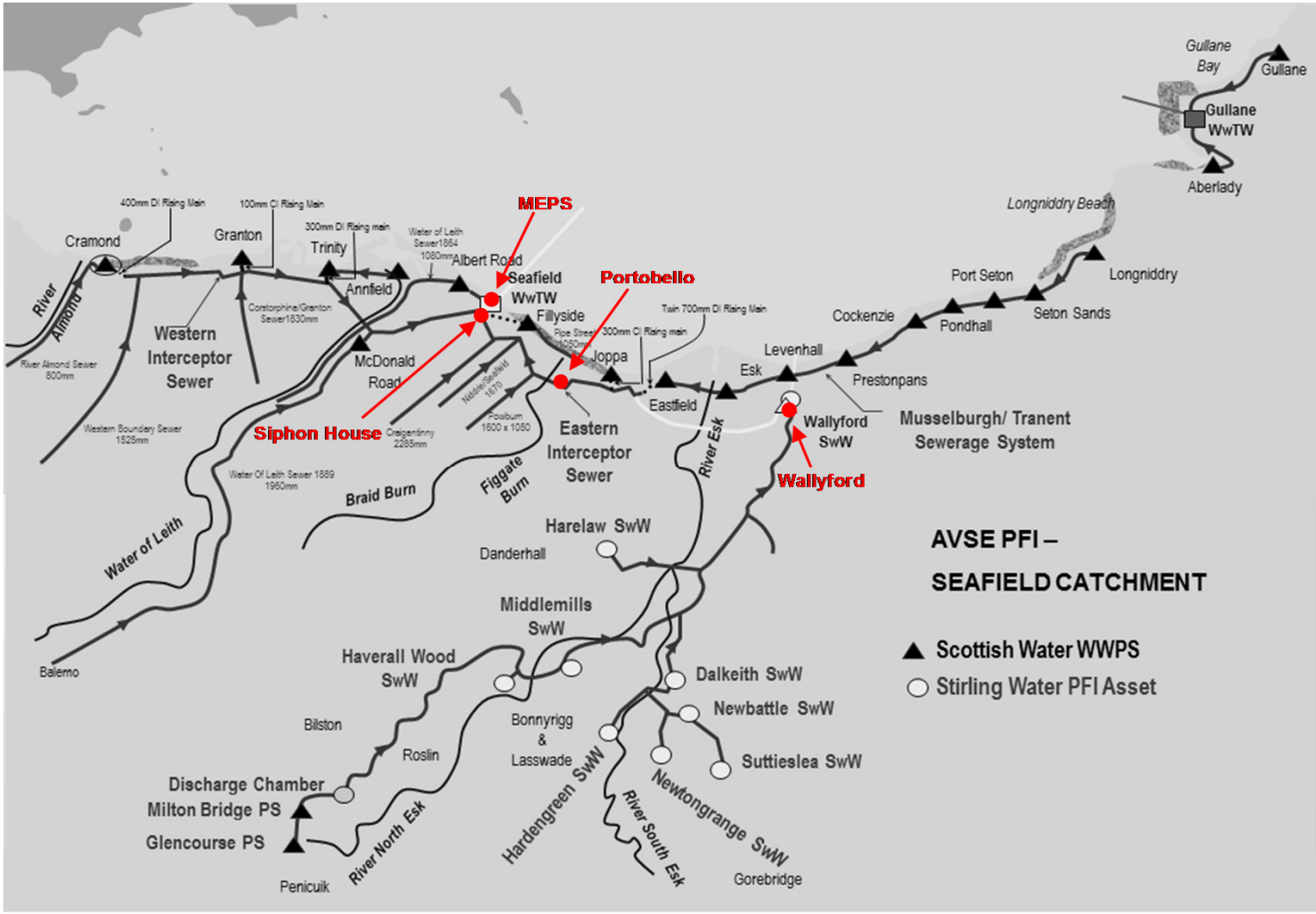
Sludge Dip Levels



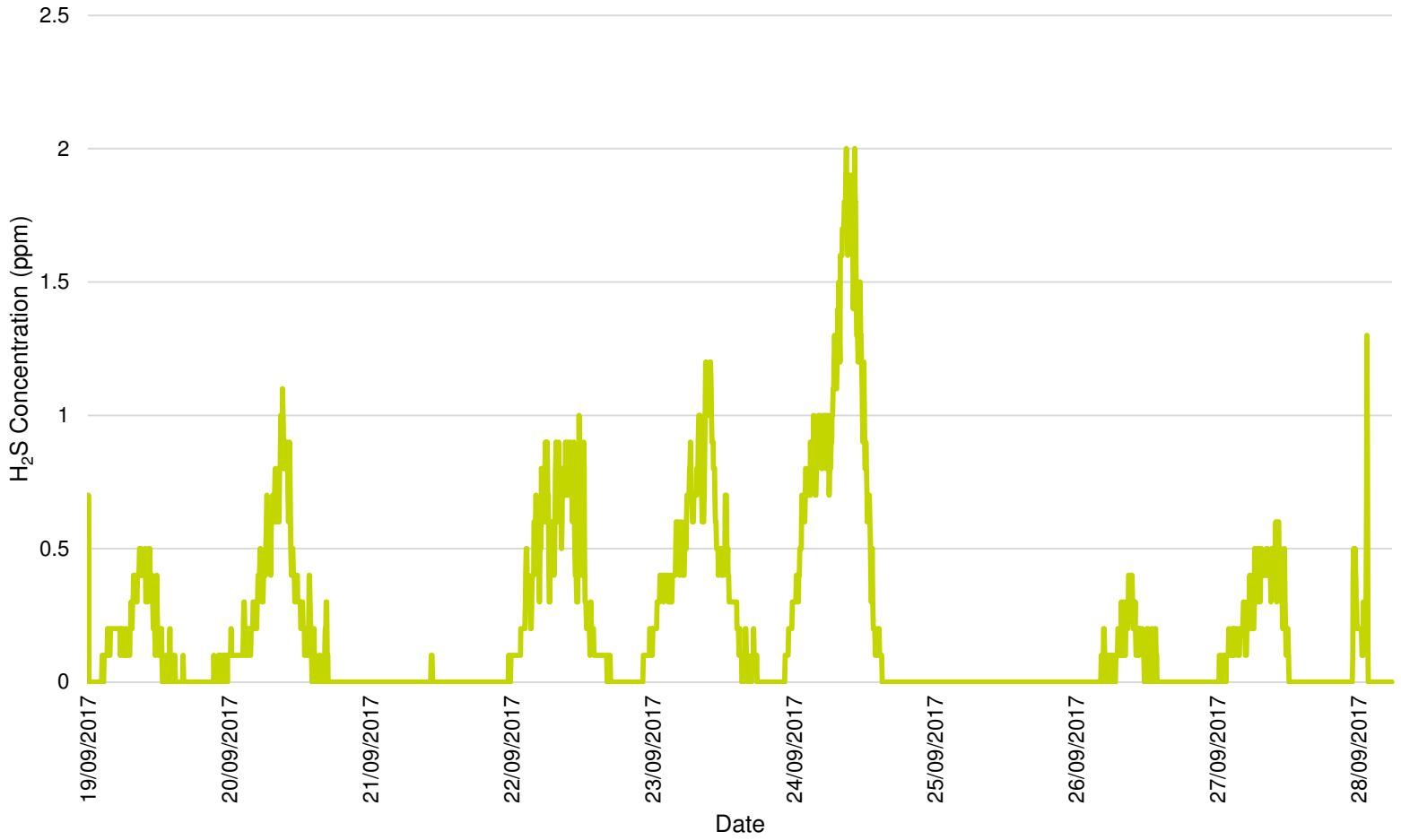
Inlet H_2S Monitor



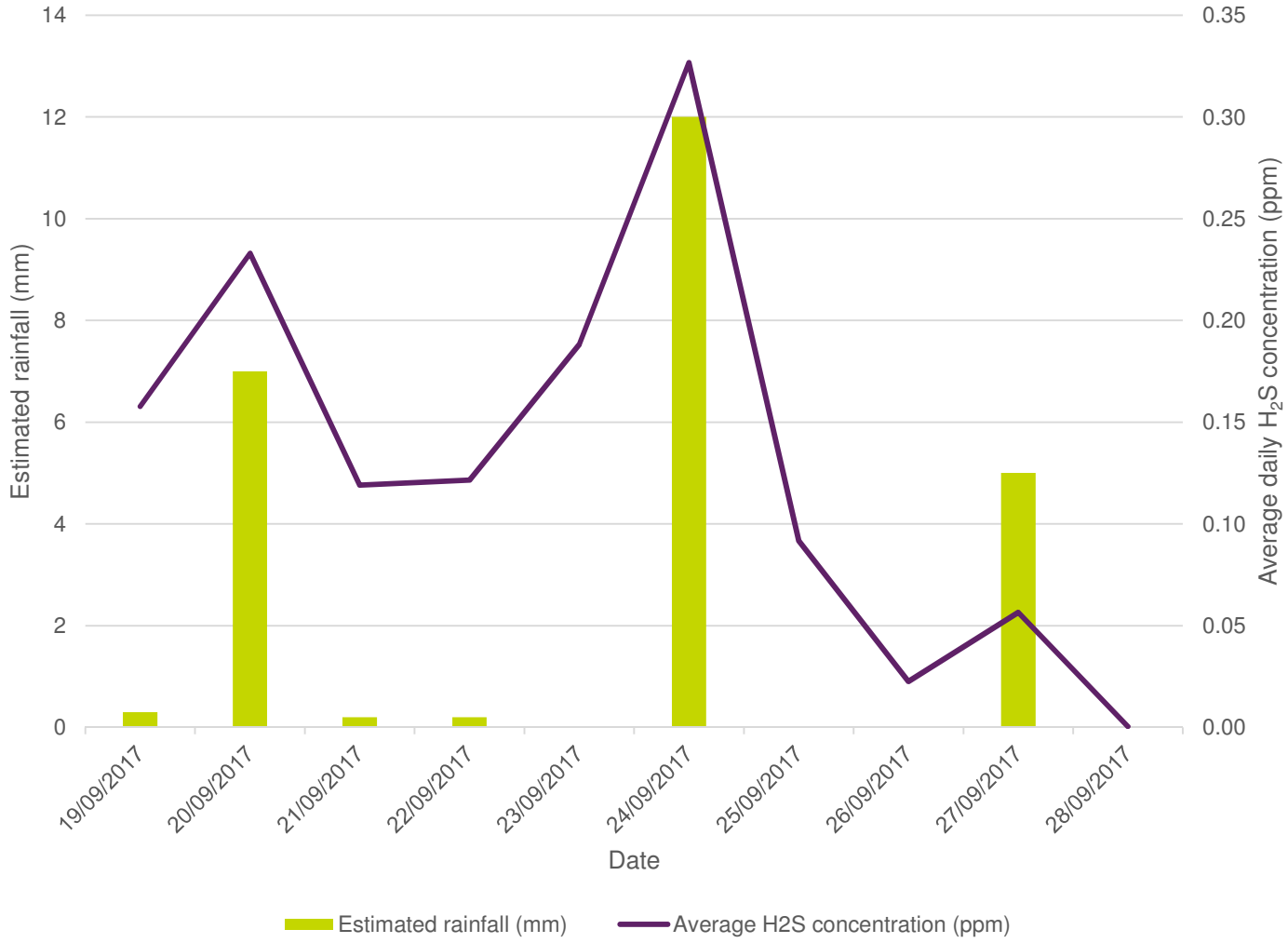
Network septicity



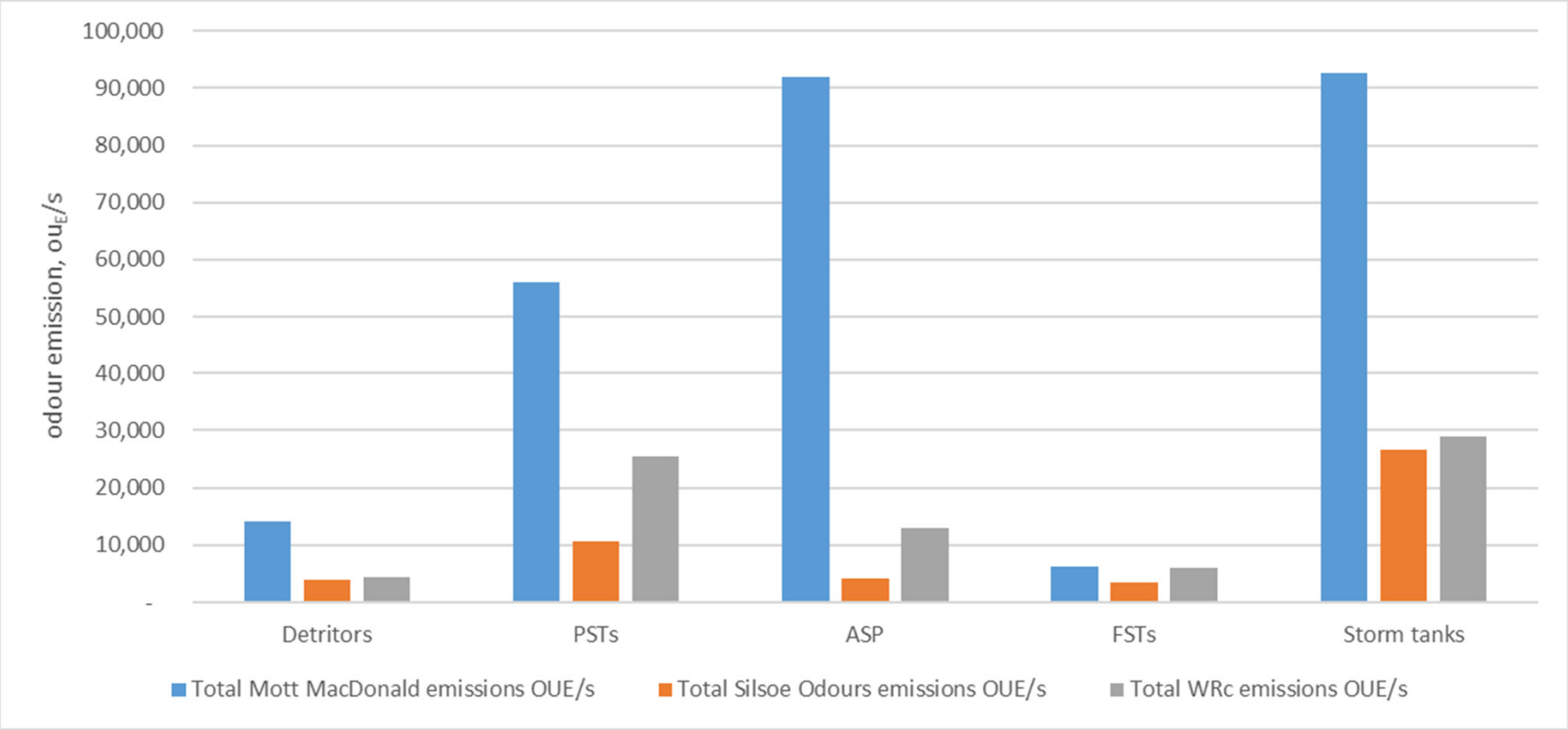
Wallyford H_2S



Siphon House H_2S monitoring versus rainfall

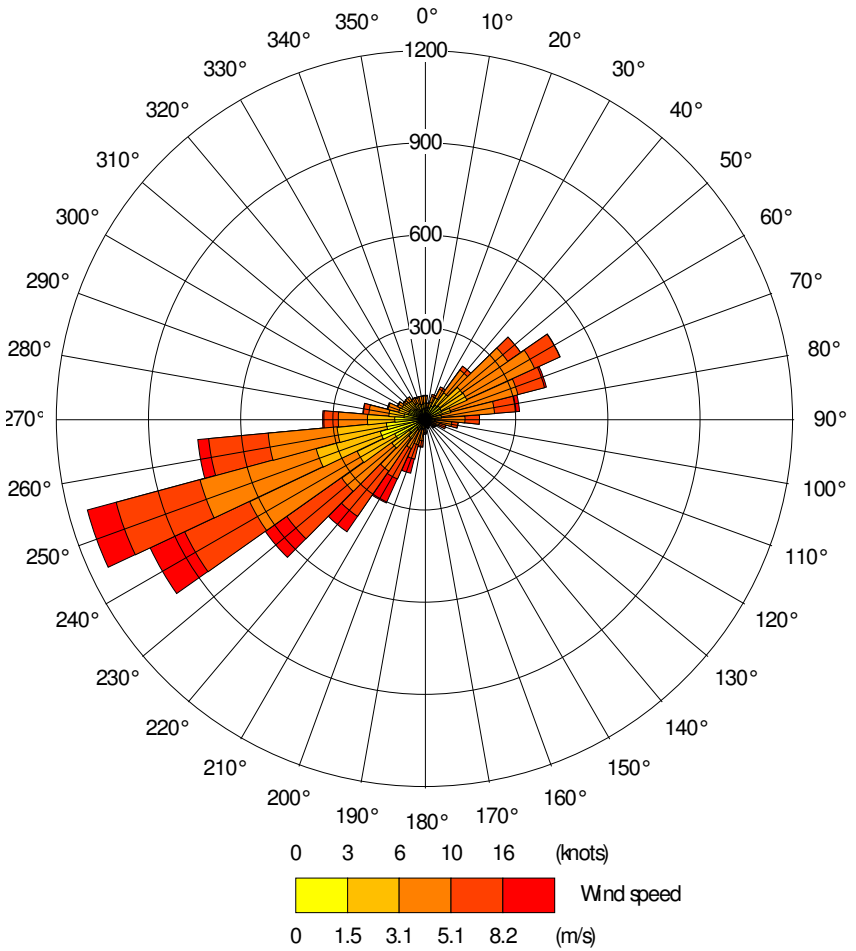


Odour emissions from unit processes



Prevailing weather conditions

- **2016 wind rose**
- **Onshore winds 25% of year**
- **2% calms**
- **8.6% onshore < 3 m/s**
- **4% onshore < 2 m/s**
- **2.03% onshore < 1 m/s**



Dispersion modelling – 4 scenarios

Scenario 1: The original WRc Option A abatement scenario emissions;

Scenario 2: The emissions measured during the 2013 Mott MacDonald odour surveys;

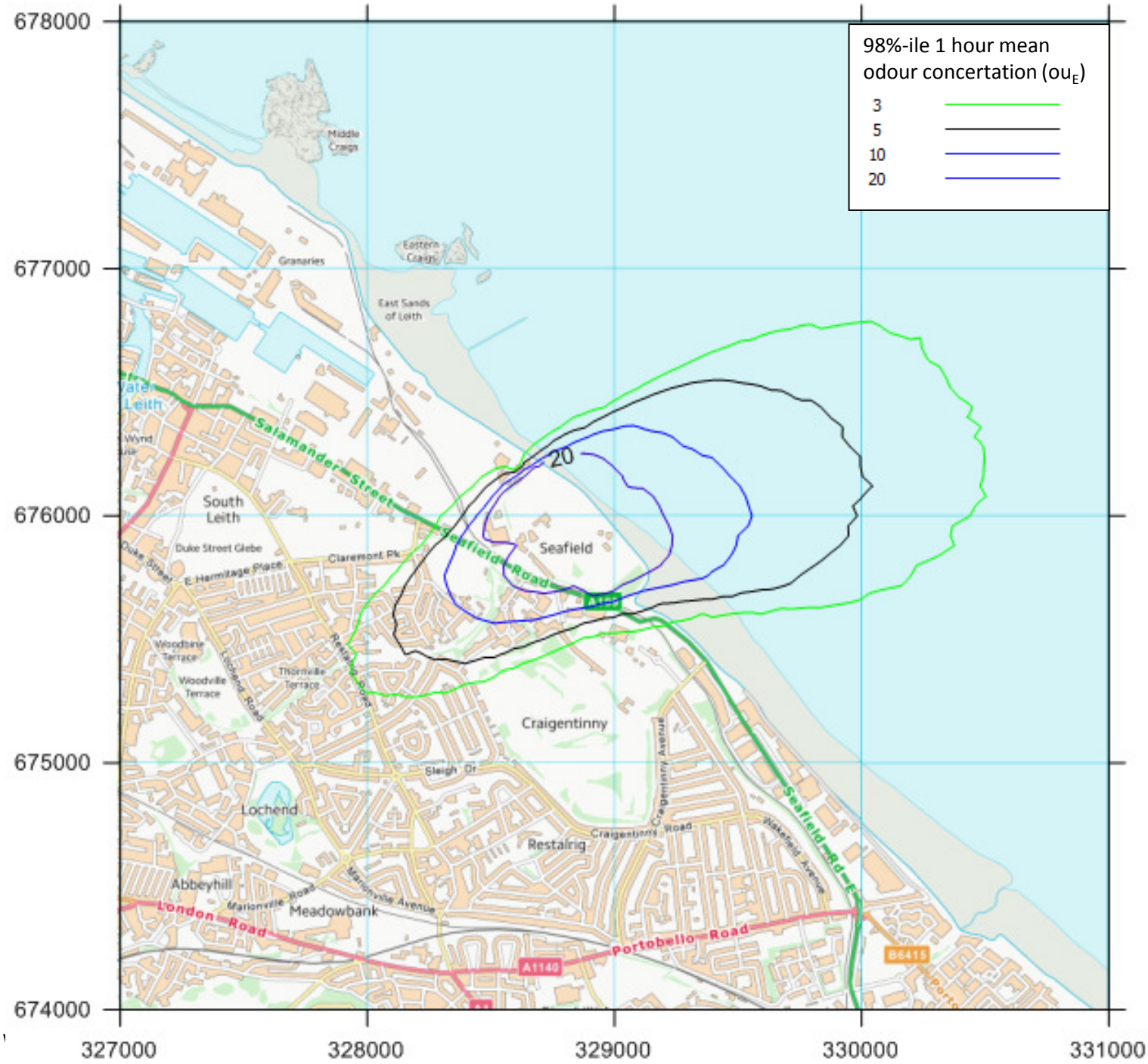
Scenario 3: Average emissions from the Amec Foster Wheeler in-house odour emission database; and

Scenario 4: Emissions derived from the 2017 Silsoe Odours Limited survey.

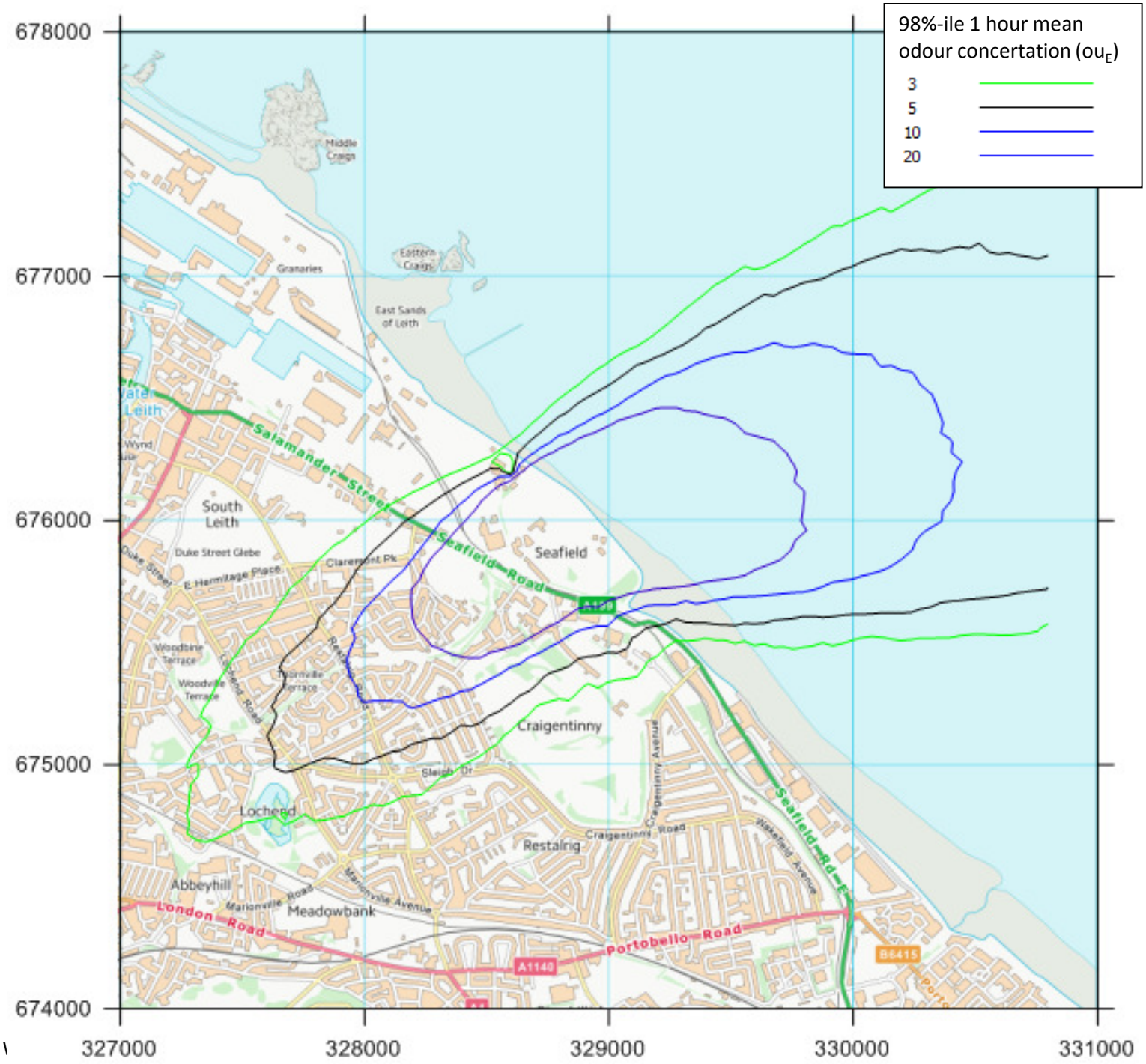
Trade Effluents

- **84 consented trade effluent discharges into the Seafield sewer network**
  - Vehicle washing, hospitals & patient care, laboratories, food, breweries, distilleries, fish processors, waste management.
- **3.8% of the total daily average wastewater flow into Seafield WwTW, 6.7% of the polluting load, expressed as BOD_5.**
- **no evident discharges of particularly odorous chemicals that could significantly influence odour emissions at Seafield**
- **check monitoring on samples of trade effluent indicated a very high level of compliance with the consented discharge limits**

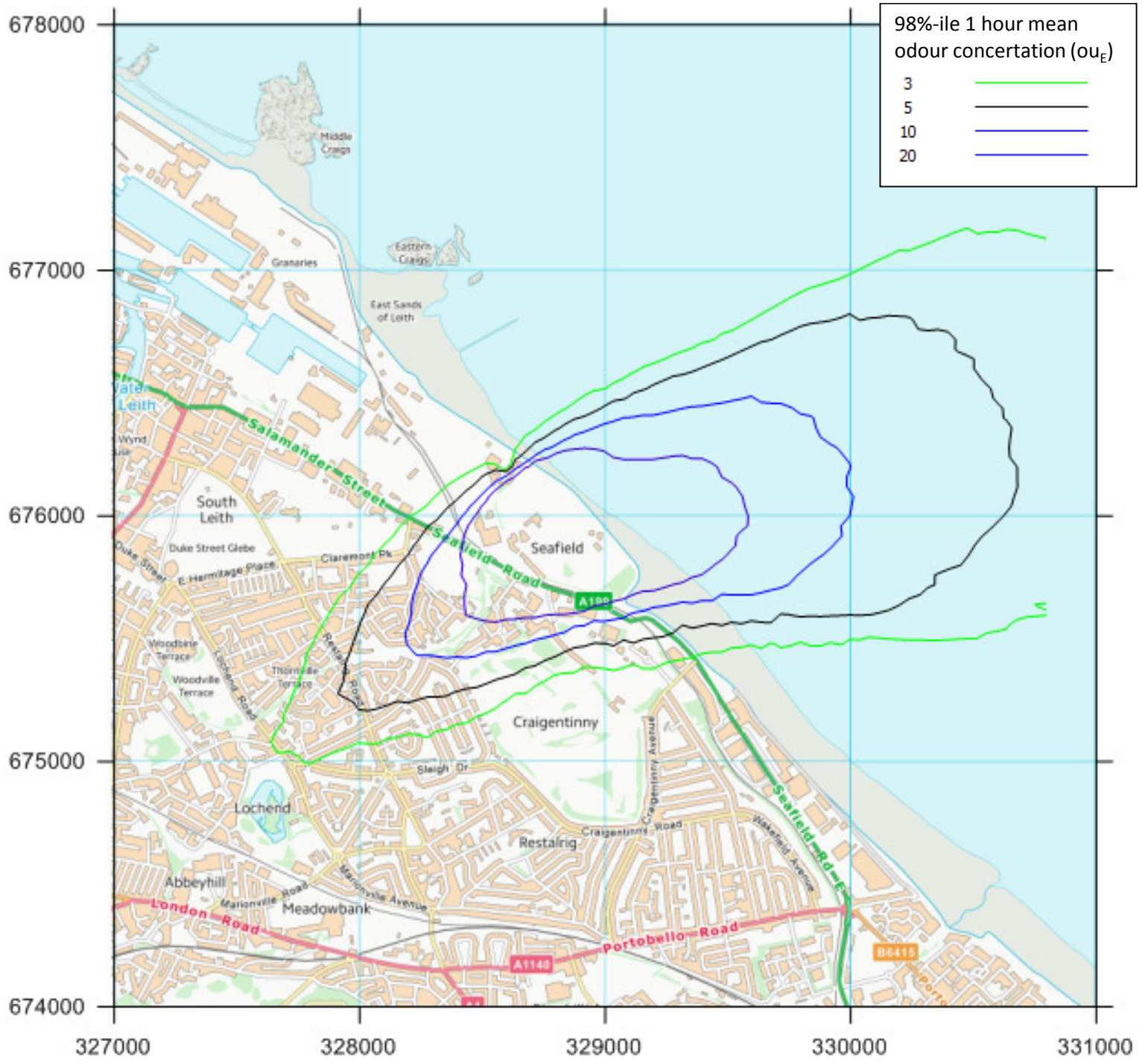
Scenario 1: Original WRc Option A abatement scenario emissions plus storm tanks



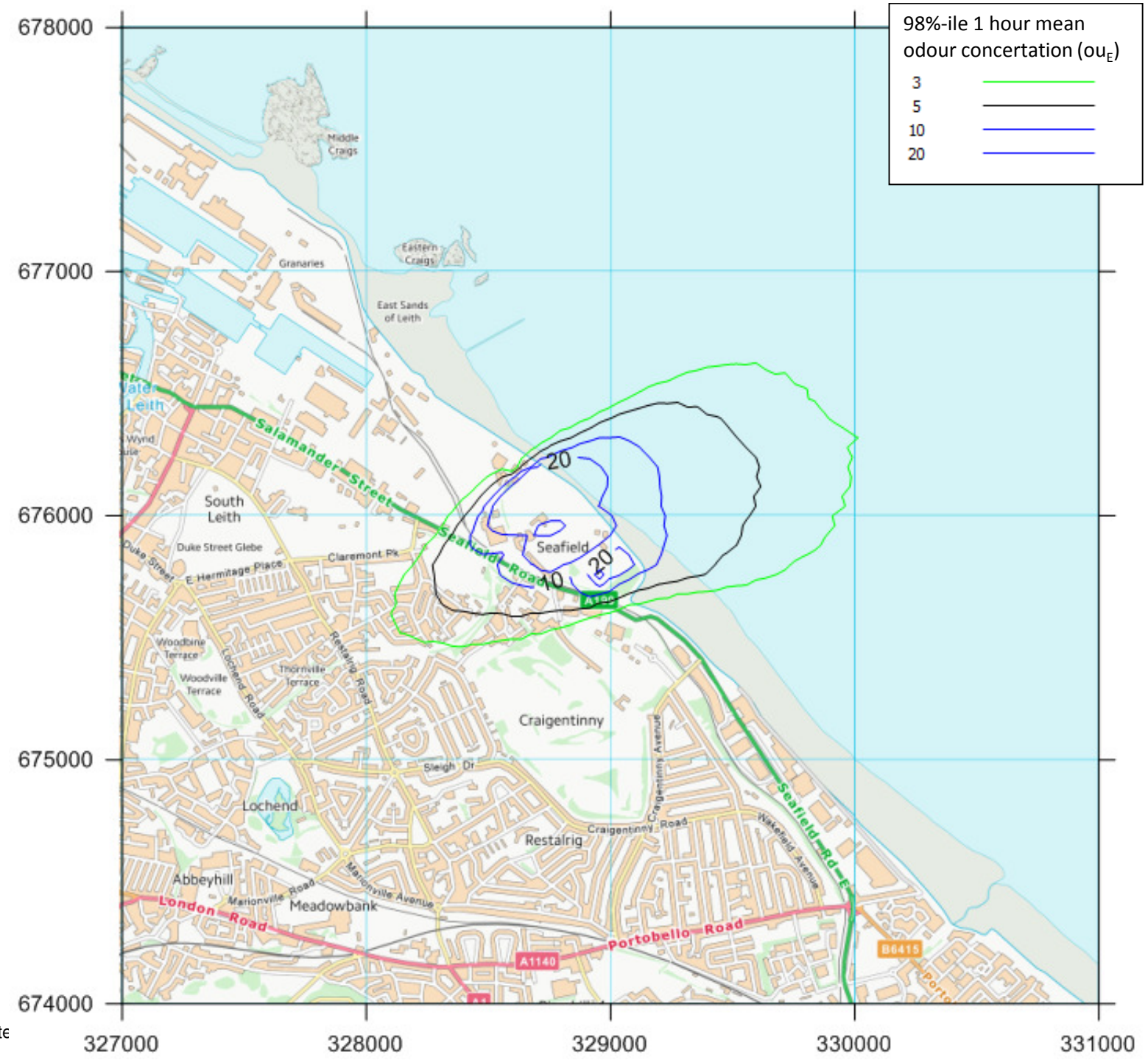
Scenario 2: Emissions measured during the 2013 Mott MacDonald odour surveys



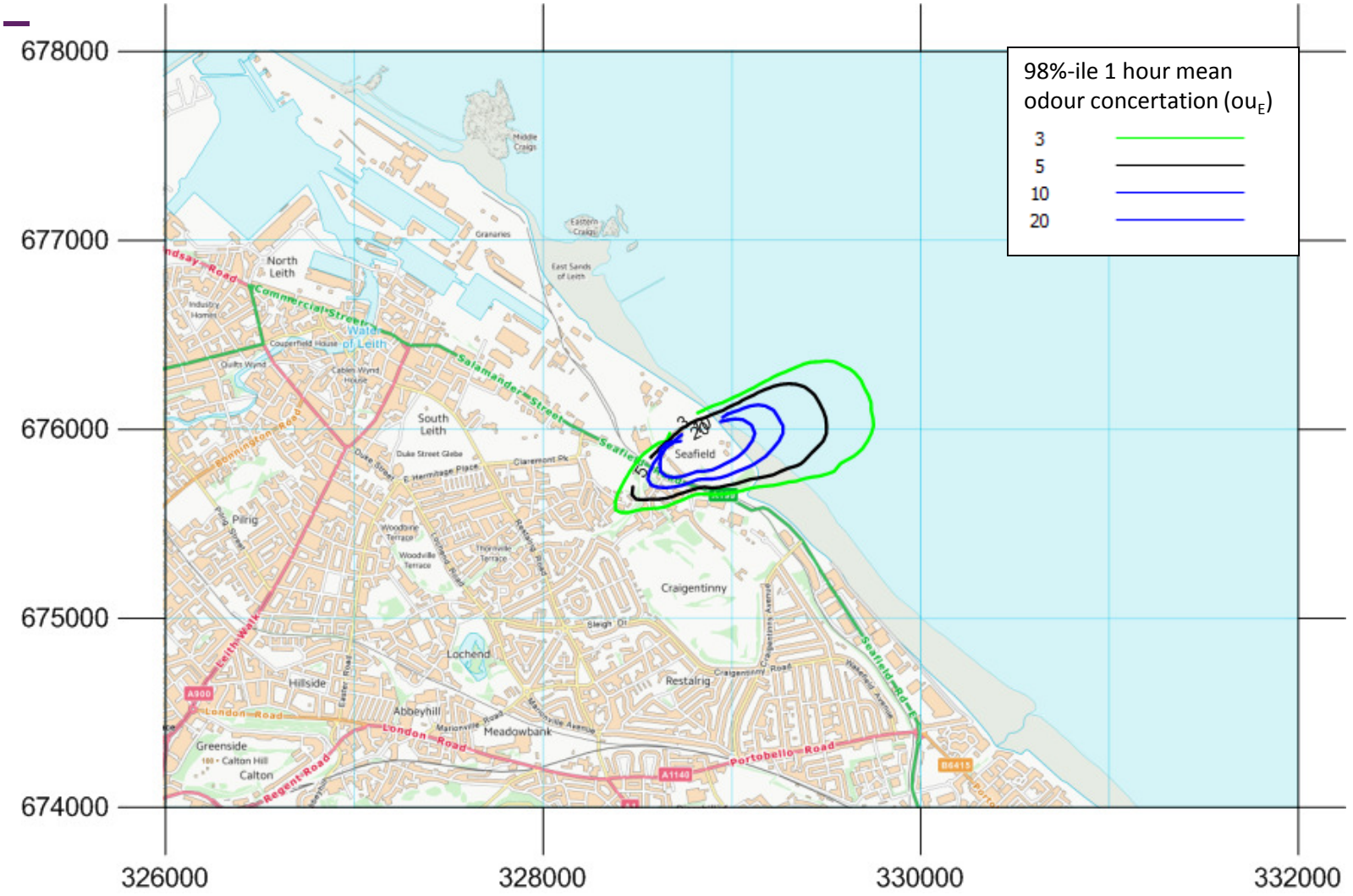
Scenario 3: Average emissions from the Amec Foster Wheeler in-house odour emission database



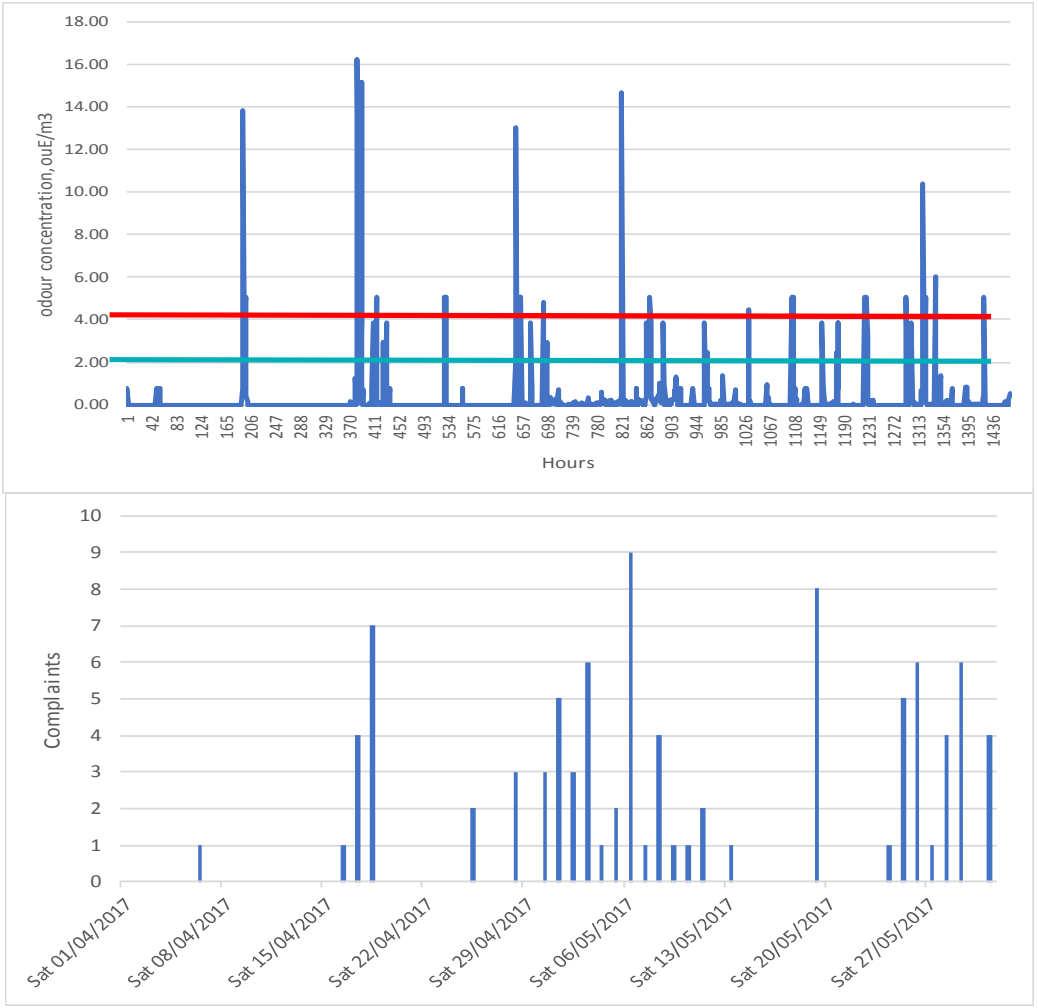
Scenario 4: Emissions derived from the 2017 Silsoe Odours Limited survey.



Odour dispersion from PSTs – Scenario 4 emission levels



Odour concentrations at Leith Links April and May 2017 and complaints



Primary settlement tank

Sludge management & handling

- **Downstream bottlenecks impact upon PST sludge blanket levels and odour emissions**
- **High odour levels in sludge cake building**
- **Fugitive emissions from building detectable at site boundary**
- **Also detected on Leith Links evening of 25th July 2017**
- **Possible increase in sludge holding capacity needed**

Storm tank cleaning

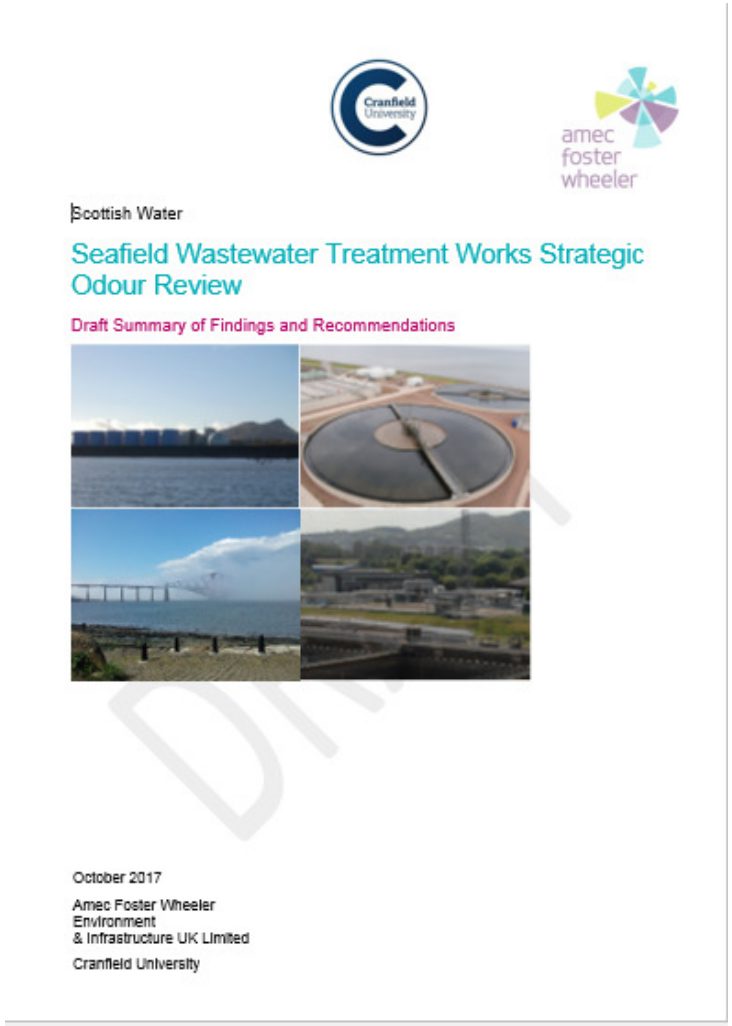
Questions & answers

What we did & found…

Recommendations (from report issued)

- **Discussion:**
  - Short term
  - Medium
  - Long term

  - Q&A


Scottish Water

Seafield Wastewater Treatment Works Strategic Odour Review

Draft Summary of Findings and Recommendations

October 2017

Amec Foster Wheeler Environment & Infrastructure UK Limited

Cranfield University

Thank you