

## **Incident Report on Discharge of High TRC Effluent exceeding 0.4mg/L from Stonecutters Island Sewage Treatment Works**

### **1. Background**

Since the completion of the flow turning from eight preliminary treatment works to Stonecutters Island Sewage Treatment Works (SCISTW), viz., North Point, Wan Chai East, Central, Sandy Bay, Cyberport, Wah Fu, Ap Lei Chau and Aberdeen, through the HATS Stage 2A sewage conveyance system in November 2015, and the commissioning of the Final Disinfection Facilities in January 2016, the testing and commissioning of the new HATS Stage 2A facilities has been underway. A standby chlorination system, installed at the Chemical Storage Compound of SCISTW, was put into operation since 6 February 2017 to facilitate the maintenance work of the chlorination facilities - which were commissioned back in March 2010. During the period of the maintenance work, the instantaneous effluent Total Residual Chlorine (TRC) before and after de-chlorination at Chamber 15A was monitored continuously through the real time on-line monitoring system.

### **2. Particulars of Incident**

Time and Date of Incident: 14:48 – 23:05, 7 February 2017

Duration of Incident: 8 hours 17 minutes

Location: Dechlorination Plant, SCISTW

#### **Description of the Incident**

At 14:48, the TRC sensors (low range) located at the downstream of the dechlorination plant to monitor the TRC level before marine outfall had recorded readings above the discharge limit of 0.4mg/L (ppm) and reaching a maximum of 2.63 mg/L at 17:39. The TRC readings returned to under 0.4 mg/L at 23:05.

### **3. Actions Taken**

- Checked and verified the accuracy of the TRC sensor system by manual sampling and portable testing kit.
- Increased sodium bisulphite dosing by manually starting an additional dosing pump.
- Cross checked the sodium hypochlorite dosing (chlorination) at upstream for any irregularity.
- Checked the quality of chemicals, chemical dosing control system, dosing pumps and chemical pipelines for abnormalities.

- Conducted additional water sampling and testing for TRC at the designated 18 marine and beach monitoring stations on 9 February 2017.

#### **4. Investigation Results**

- (a) No abnormality was found to the sodium bisulphite dosing system (both hardware and software) at the Dechlorination plant. All TRC sensors were checked and the accuracy was verified with manual sampling and portable testing kit. The sodium bisulphite dosing pumps were also functioning normally in response to the TRC before dechlorination and there was no leakage or blockage of chemical pipelines.
- (b) The standby chlorination system was dosing sodium hypochlorite in proportion to the sewage flow but the feedback control for reducing the chemical dosage when there is high TRC level detected before dechlorination was not available. As a result, the sodium hypochlorite dosage could not be automatically reduced in response to the high TRC level before dechlorination.
- (c) Purities of the chlorination / dechlorination chemicals (sodium hypochlorite & sodium bisulphite) were found normal.
- (d) The additional water sampling and testing results for TRC at the 18 marine and beach monitoring stations on 9 February 2017 (Appendix 1) also indicated that the measured TRC levels were all below the detection limit.

#### **5. Conclusion**

Since the chemical dosing systems of the chlorination and dechlorination plants at SCISTW were thoroughly checked and found functioning normally, it can be confirmed that the incident was not caused by malfunctioning of the dosing systems. Fluctuations in the sewage quality might be a contributing factor. DSD will continue to closely monitor the performance of the chlorination / dechlorination systems and take prompt actions according to the contingency plans which will be further strengthened to cater for similar incident in future.

\* hourly average TRC figure, in accordance with Clause 5.92 of the EIA report

\*\* 95 percentile TRC figure, in accordance with the Discharge Licence

**Table 1: Preliminary Results (Note: all measured TRC levels were below detection limit)**

Date	Tide	Monitoring Station	TRC (mg/l)
09/02/17	Mid-Ebb	B7	<0.2
09/02/17	Mid-Ebb	B8	<0.2
09/02/17	Mid-Ebb	B9	<0.2
09/02/17	Mid-Ebb	B10	<0.2
09/02/17	Mid-Ebb	B11	<0.2
09/02/17	Mid-Ebb	B12	<0.2
09/02/17	Mid-Ebb	B13	<0.2
09/02/17	Mid-Ebb	B14	<0.2
09/02/17	Mid-Ebb	F5	<0.2
09/02/17	Mid-Ebb	WSD18	<0.2
09/02/17	Mid-Ebb	WSD19	<0.2
09/02/17	Mid-Ebb	WSD20	<0.2
09/02/17	Mid-Ebb	WM4	<0.2
09/02/17	Mid-Ebb	VM8	<0.2
09/02/17	Mid-Ebb	VM7	<0.2
09/02/17	Mid-Ebb	SM6	<0.2
09/02/17	Mid-Ebb	SM12	<0.2
09/02/17	Mid-Ebb	NM1	<0.2

**Table 2: Coordinates of Monitoring Stations for Marine and Beach Water Quality Monitoring**

Station	Description	Easting	Northing
B7	Anglers' Beach	823836.36	825044.52
B8	Gemini Beach	825215.29	824933.71
B9	Ho Mei Wan Beach	825388.98	825067.17
B10	Casam Beach	825731.46	825330.90
B11	Lido Beach	825917.78	825385.83
B12	Ting Kau Beach	826277.40	825519.01
B13	Approach Beach	827237.94	825301.02
B14	Ma Wan Beach	824431.47	823415.85
F5	Ma Wan Fish Culture Zone	823875.25	823699.48
WSD18	Central Water Front	833935.18	816624.15
WSD19	Sheung Wan	833383.13	816836.34
WSD20	Kennedy Town	830826.34	816244.46
WM4	Gradient Station	825354.99	823325.61
VM8	Gradient Station	830363.95	817092.23
VM7	Gradient Station	832495.44	817473.60
SM6	Control Station	826179.81	805902.89
SM12	Control Station	819524.19	808420.40
NM1	Control Station	820255.99	823213.76

**Figure 1: Location Plan of Monitoring Stations**

