

 土木工程拓展署
Civil Engineering and
Development Department

**Environmental Monitoring and Audit
for Contaminated Mud Pit at Sha
Chau (2009-2013) – Investigation
Agreement No. CE 4/2009(EP)**

**30th Monthly Progress Report for
Contaminated Mud Pits at Sha Chau –
December 2011**

Revision 0

21 March 2012

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30th Monthly Progress Report for Contaminated Mud Pits at Sha Chau – December 2011

Revision 0

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| Client: Civil Engineering and Development Department (CEDD) | | Project No: 0103262 | | | |
| Summary: This document presents progress of monitoring works on contaminated mud pits at Sha Chau in December 2011 under Agreement No. CE 4/2009 (EP). | | Date: 21 March 2012 | | | |
| | | Approved by: Dr Robin Kennish Director | | | |
| | | | | | |
| 0 | 30 th Monthly Progress Report for CMP | CL | JT | RK | 21/03/12 |
| Revision | Description | By | Checked | Approved | Date |
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Agreement No. CE 4/2009 (EP)
Environmental Monitoring and Audit
for Contaminated Mud Pit at Sha Chau (2009-2013) - Investigation

30th MONTHLY PROGRESS REPORT
FOR CONTAMINATED MUD PITS AT SHA CHAU
December 2011

1.1 BACKGROUND

Since 1992, the East of Sha Chau area has been the site of a series of dredged contaminated mud pits (CMPs) designed to provide confined marine disposal capacity for contaminated mud arising from the HKSAR's dredging and reclamation projects. In December 2011, CMP IVc was in operation for backfilling by contaminated mud and was anticipated to reach its capacity in February 2012. A series of four newly constructed seabed pits at the East of Sha Chau area, CMP Va-d, will be provided for the disposal of contaminated mud after CMP IVc is full. The dredging of CMPs Va and Vb had been completed and that of CMP Vc was in progress. The environmental monitoring and audit (EM&A) programme for the CMPs at the East of Sha Chau area presently covers disposal and capping operations at CMP IV and dredging operations at CMP Vc.

1.2 REPORTING PERIOD

This *Monthly Progress Report* covers the monitoring period of December 2011.

1.3 DETAILS OF SAMPLING AND LABORATORY TESTING ACTIVITIES

The following monitoring activities have been undertaken for the CMPs in December 2011:

- *Water Quality Monitoring during Capping* was conducted for CMP IVb on 2 December;
- *Benthic Recolonisation Monitoring* was conducted for CMP IIIId on 14 December;
- *Cumulative Impact Sediment Chemistry Monitoring and Sediment Toxicity Test* were conducted for CMP IVc on 15 December;
- *Impact Water Quality Monitoring during Dredging Operations* was conducted for CMP Vc on 22 December;
- *Pit Specific Sediment Chemistry Monitoring* was conducted for CMP IVc on 16 December; and

- *Water Column Profiling* was conducted for CMP IVc on 28 December.

A summary of field activities is presented in *Annex A*.

A summary of monitoring data submitted by the Contractor for this reporting month is presented in *Table 1.1*.

Table 1.1 *Summary of monitoring data submitted by the Contractor for the reporting month*

| Key Task | Monitoring Component | Date of Results Received from the Contractor |
|--|----------------------|--|
| CMP V | | |
| Impact Monitoring during Dredging Operations | Water Quality | 9 February 2012 |

1.4 *DETAILS OF OUTSTANDING SAMPLING AND / OR ANALYSIS*

No outstanding sampling and laboratory analysis remained from December 2011.

1.5 *BRIEF DISCUSSION OF THE MONITORING RESULTS*

1.5.1 *CMP V*

Impact Water Quality Monitoring during Dredging Operations of CMP V – December 2011

Impact Water Quality Monitoring during Dredging Operations of CMP V was conducted on 22 December 2011. On the survey day, sampling was conducted during both mid-ebb and mid-flood tides at two Reference (Upstream) stations upstream and five Impact (Downstream) stations downstream of the dredging operations at CMP Vc (*Figure 1.1*). Monitoring was also conducted at the Ma Wan station. At each station, *in-situ* measurements of water quality parameters as well as water samples were taken from three depths in the water column (ie surface: 1 m below sea surface, mid-depth and bottom: 1 m above the seabed).

Monitoring results are presented in *Table B1* of *Annex B*. Levels of Dissolved Oxygen (DO), Turbidity and Total Suspended Solids (TSS) complied with the Action and Limit Levels set in the *Baseline Monitoring Report* ⁽¹⁾. Overall, the results indicated that the dredging operations at CMP V did not appear to cause any deterioration in water quality during this reporting period.

(1) ERM (2009) *Baseline Monitoring Report. Environmental Monitoring and Audit for Contaminated Mud Pit at Sha Chau (2009-2013) – Investigation*. Agreement No. CE 4/2009(EP). Submitted to EPD in September 2009.

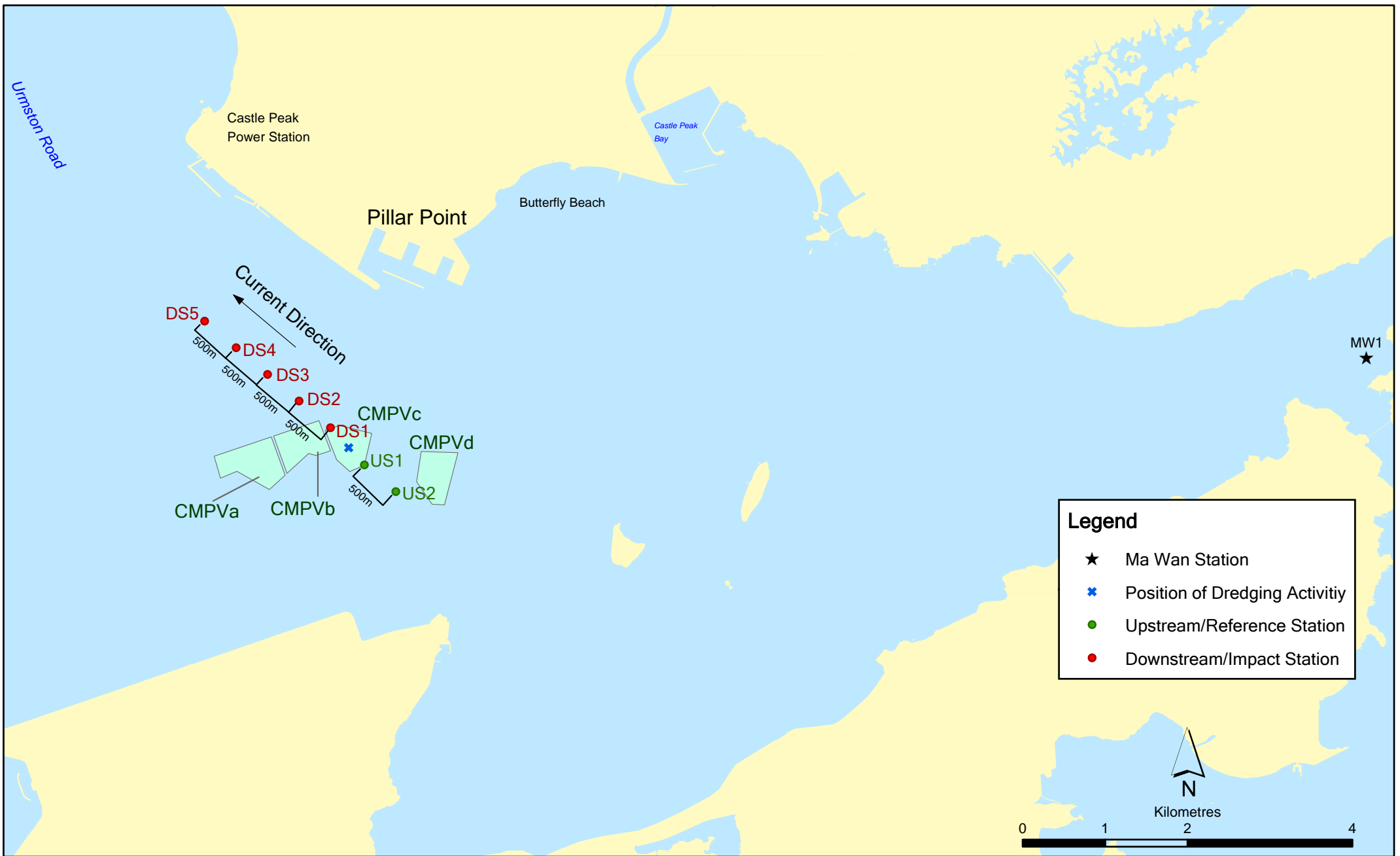


Figure 1.1

Indicative Dredging Impact Sampling Stations for CMPVc

Note: The locations of sampling stations will be determined on site based on current direction and position of dredging activities.

File: CMPV0103262_modelling stations2.mxd
Date: 27/03/2012

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Therefore, no further mitigation measures, except for those recommended in the Environmental Permit (EP-312/2008), are considered required for the dredging operations of CMP V.

Overall, there is no evidence of any unacceptable water quality impacts as a result of the dredging operations at CMP V.

1.6 *ACTIVITIES SCHEDULED FOR THE NEXT MONTH*

The following monitoring programmes will be conducted in the next monthly period of January 2012:

- *Water Column Profiling* for CMP IVc;
- *Demersal Trawling* for CMP IVc; and
- *Impact Water Quality Monitoring during Dredging Operations* for CMP Vc.

The sampling schedule is presented in *Annex A*.

1.7 *STUDY PROGRAMME*

A summary of the Study Programme is presented in *Annex C*.

Annex A

Sampling Schedule

| Baseline Water Quality Monitoring | | 2009 | | | | 2010 | | | | | | | | | | | | 2011 | | | | | 2012 | | | | | | | | | | | | | | | |
|-----------------------------------|----------|--|---|---|---|------|---|---|---|---|---|---|---|---|---|---|---|------|---|---|---|---|------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|
| | | J | A | S | O | N | D | J | F | M | A | M | J | J | A | S | O | N | D | J | F | M | A | M | J | J | A | S | O | N | D | J | F | M | A | M | J | |
| Near Field | ESC-WNAA | * | * | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | ESC-WNAB | * | * | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | ESC-WNAC | * | * | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | ESC-WNAD | To be surveyed 24 times (3 days per week during mid-flood and mid-ebb tide of each day) in the month prior to commencement of marine works | | * | * | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | ESC-WNBA | * | * | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | ESC-WNBB | * | * | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | ESC-WNBC | * | * | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ESC-WNBD | * | * | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mid Field | ESC-WMB | To be surveyed 24 times (3 days per week during mid-flood and mid-ebb tide of each day) in the month prior to commencement of marine works | | * | * | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | ESC-WMA | * | * | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Far Field | ESC-WFA | To be surveyed 24 times (3 days per week during mid-flood and mid-ebb tide of each day) in the month prior to commencement of marine works | | * | * | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | ESC-WFB | * | * | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | MW1 | * | * | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Reference Stations | NM1 | * | * | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | NM2 | * | * | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | NM3 | * | * | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | NM5 | To be surveyed 24 times (3 days per week during mid-flood and mid-ebb tide of each day) in the month prior to commencement of marine works | | * | * | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | NM6 | * | * | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | NM6 | * | * | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Water Column Profiling | | J | A | S | O | N | D | J | F | M | A | M | J | J | A | S | O | N | D | J | F | M | A | M | J | J | A | S | O | N | D | J | F | M | A | M | J | | |
|------------------------|------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|--|
| Plume Stations | Upstream | | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | Downstream | | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Water Quality Impact Monitoring for Dredging | | J | A | S | O | N | D | J | F | M | A | M | J | J | A | S | O | N | D | J | F | M | A | M | J | J | A | S | O | N | D | J | F | M | A | M | J | | |
|--|-----|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Downcurrent Impact Stations | DS1 | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| | DS2 | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| | DS3 | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| | DS4 | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| | DS5 | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| Upcurrent Stations | US1 | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | |
| | US2 | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | |
| | MW1 | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | * | |

Sampling completed
 Sampling to be completed

Annex B

Monitoring Results

Table B1 *Summary Table of DO, Turbidity and TSS Levels Recorded in December 2011*

| Sampling Date | Tidal Period | Station | Average DO Levels (mg/L) | | Average Turbidity Level (NTU) | Average TSS Level (mg/L) |
|---------------|--------------|---------|--------------------------|-----------------------|-------------------------------|--------------------------|
| | | | Bottom | Surface and Mid Depth | | |
| 2011/12/22 | ME | DS1 | 6.99 | 6.92 | 11.40 | 14.50 |
| | | DS2 | 6.92 | 6.92 | 7.00 | 7.33 |
| | | DS3 | 7.05 | 7.04 | 7.20 | 7.00 |
| | | DS4 | 7.01 | 7.03 | 7.40 | 7.33 |
| | | DS5 | 7.02 | 6.98 | 8.50 | 8.00 |
| | | MW1 | 6.25 | 6.25 | 5.1 | 5.50 |
| | MF | US1 | 6.97 | 6.94 | 8.30 | 9.67 |
| | | US2 | 7.04 | 6.97 | 9.60 | 10.17 |
| | | DS1 | 7.28 | 7.20 | 12.80 | 20.33 |
| | | DS2 | 7.35 | 7.30 | 9.60 | 13.00 |
| | | DS3 | 7.30 | 7.30 | 9.50 | 13.00 |
| | | DS4 | 7.30 | 7.32 | 9.40 | 12.83 |
| | | DS5 | 7.39 | 7.41 | 8.30 | 11.67 |
| | | MW1 | 6.71 | 6.70 | 4.60 | 7.17 |
| | | US1 | 7.17 | 7.11 | 10.50 | 11.67 |
| | | US2 | 6.84 | 7.08 | 31.40 | 48.67 |

Notes:

1. Cell shaded yellow indicated value exceeding the Action Level criteria.
2. Cell shaded red indicated value exceeding the Limit Level criteria.
3. Please refer to *Section 1.5* for any actions taken regarding the exceedance noted.
4. DO for Surface and Mid-depth: less than 3.76 mg L⁻¹ (Action Level); less than 3.11 mg L⁻¹ (Limit Level)
 DO for Bottom: less than 2.96 mg L⁻¹ (Action Level); less than 2 mg L⁻¹ (Limit Level)
 Depth-average Turbidity: greater than 28.14 (Action Level); greater than 38.32 (Limit Level)
 Depth-average SS: greater than 37.88 mg L⁻¹ (Action Level); greater than 61.92 mg L⁻¹ (Limit Level)

Annex C

Study Programme

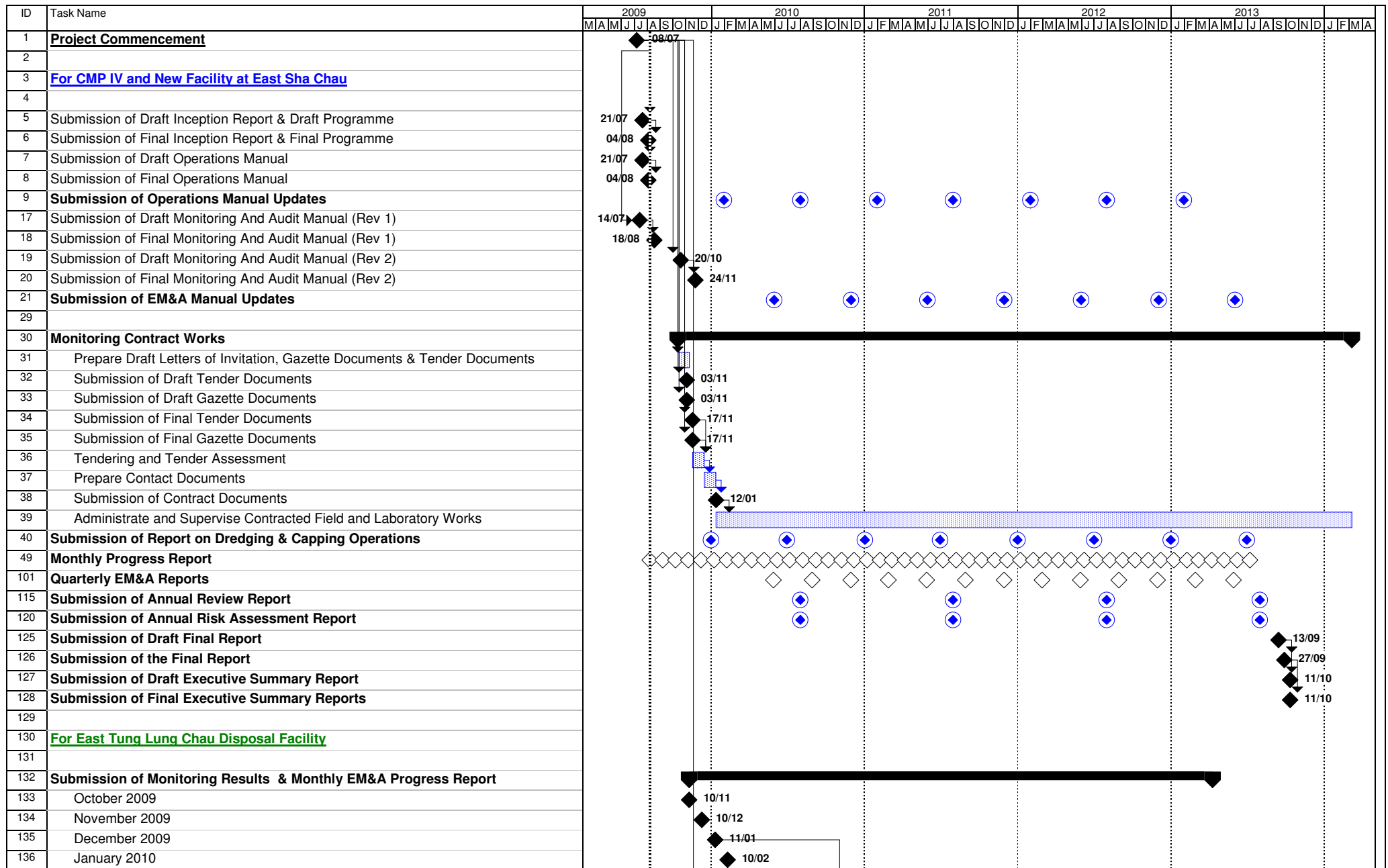


Figure 4.1 - Study Programme



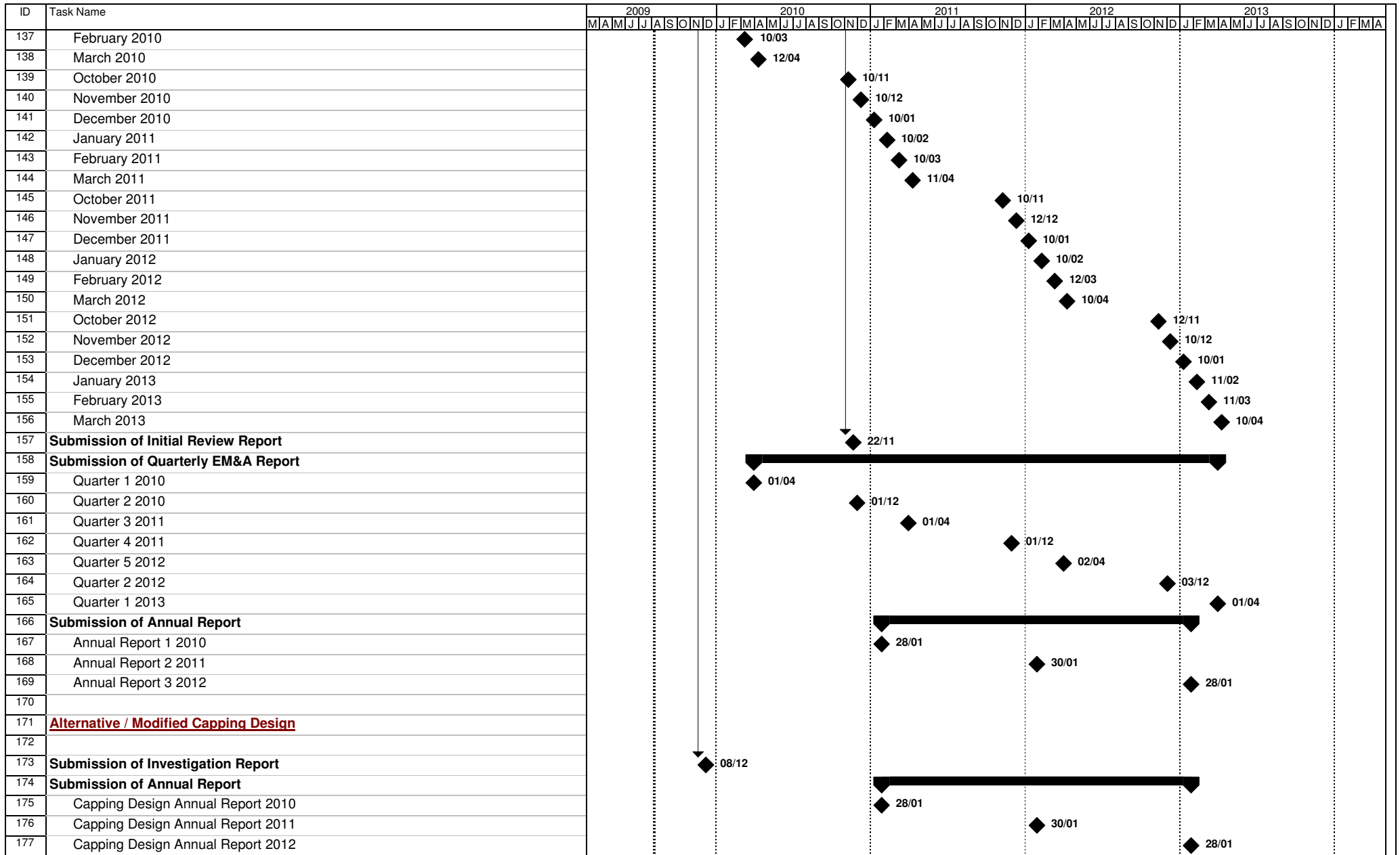


Figure 4.1 - Study Programme



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