

Particle modelling of pollutant dispersion from the YTB Stormwater Culvert – Scenario 1B

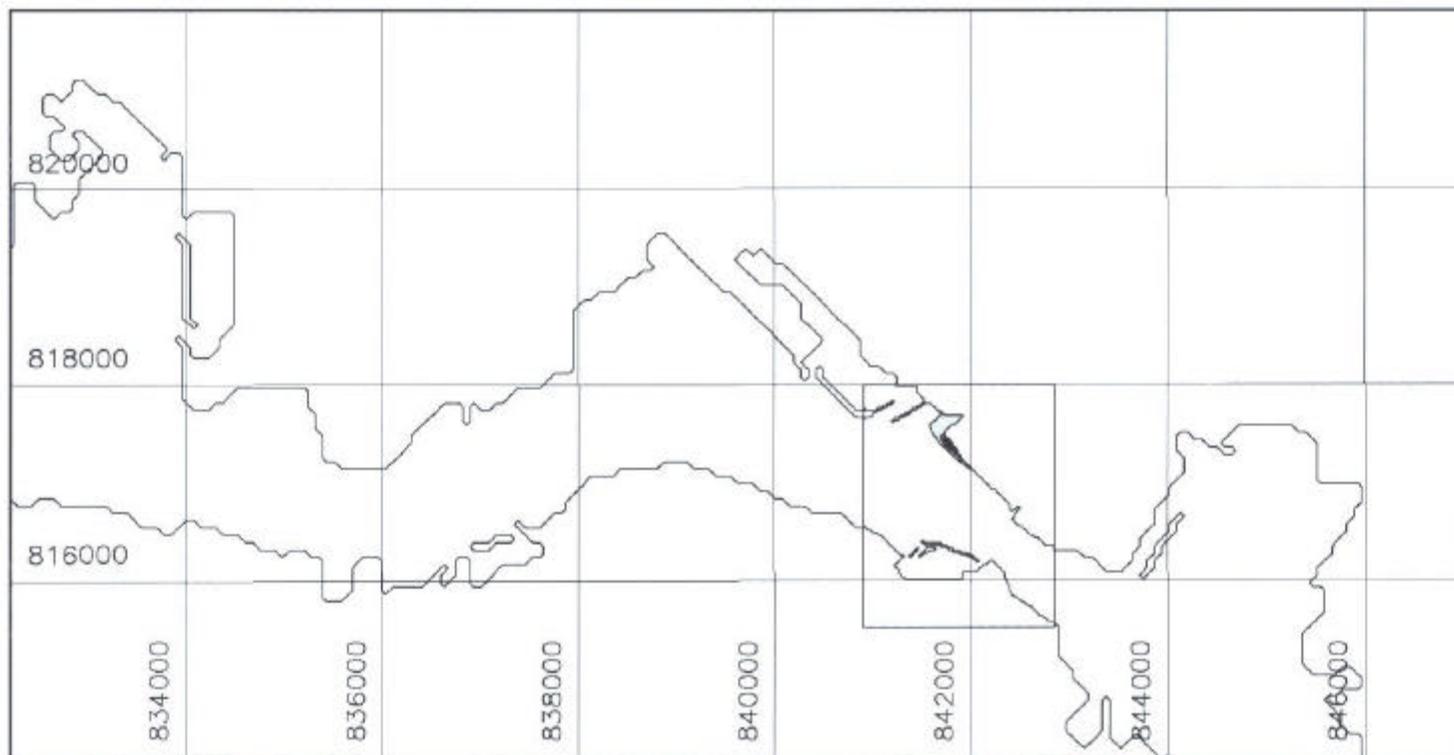
1. The particle model used is similar to that described in Appendix 6C.
2. The modelled pollutant elevations in Victoria Harbour due to the discharge from the YTB Stormwater Culvert are shown in Figures 6D.1–6D.4. The depth averaged pollutant elevation is reduced rapidly from the maximum of 33.1 mgL⁻¹ at the storm culvert outfall to less than 5 mgL⁻¹, i.e. more than 6times dilution, within 100m from the new waterfront around YTB. Similar trends are revealed in the top 5m layer results. The mean pollutant elevation in Victoria Harbour is less than 5 mgL⁻¹ while that under the proposed concrete decking is below 10 mgL⁻¹. The maximum pollutant elevation at the planned WSRs, namely, the potentially re-provisioned Cha Kwo Ling (NCKLSPS) and Yau Tong (NYTSPS) saltwater pumping stations are 25.8 mgL⁻¹ and 14.2 mgL⁻¹ respectively.
3. Based on the ratio between the actual and the modelled pollution loads of each pollutant, the actual pollutant elevation in Victoria Harbour can be estimated (Appendix 6C). The predicted increase in BOD₅, SS, Ammoniacal Nitrogen and *E. Coli.*, corresponding to the modelled pollutant elevation, are shown in Table 6D.1. Tidal mixing and decay within the stormwater culvert is not taken into account in the present Scenario 1B.

Table 6D.1 Estimated Pollutant Elevation due to the Discharge from the New YTB Stormwater Culvert

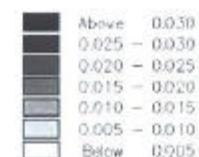
Modelled Pollutant Elevation ⁽¹⁾ [mgL ⁻¹]	BOD ₅ ⁽²⁾ [mgL ⁻¹]	SS ⁽²⁾ [mgL ⁻¹]	Ammoniacal Nitrogen ⁽²⁾ [mgL ⁻¹]	<i>E. Coli.</i> ⁽²⁾ [count per 100mL]
5	0.04	0.05	2.86 x 10 ⁻³	2370
10	0.09	0.09	5.72 x 10 ⁻³	4740
15	0.13	0.14	8.58 x 10 ⁻³	7109
20	0.17	0.18	1.14 x 10 ⁻²	9479
25	0.21	0.23	1.43 x 10 ⁻²	11849
30	0.26	0.27	1.72 x 10 ⁻²	14218
35	0.3	0.32	2 x 10 ⁻²	16588

Notes:

1. Modelled pollutant elevation corresponds to an arbitrary pollutant discharge rate of 1 kg s⁻¹ (86400 kg day⁻¹) at the outfall of the YTB Stormwater Culvert.
2. Calculations were based on the pollution load in the Yau Tong stormwater system in year 2011 as shown in Table 6.10, assuming 5% residual flows remain from expedient connections and including the pollution load from surface runoff.
3. The results presented are based on the Full Reclamation option for YTB.
4. The modelled pollutant age distributions showed that the pollutants will take an average time of less than 2 hours to travel away from the outfall of the stormwater culvert into Victoria Harbour (Figures 6D.5–6D.8). This indicates that tidal current prevents the accumulation of pollutants under the proposed concrete decking and in Victoria Harbour, and thus, unacceptable water quality is not expected.



Conc. [g/L]



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YAU TONG BAY DEVELOPMENT
ENVIRONMENTAL IMPACT ASSESSMENT STUDY
IMPACT OF THE NEW YTB STORMWATER CULVERT (SCENARIO 1B), DEPTH AVERAGED
POLLUTANT CONCENTRATION IN DRY SEASON, SPRING AND NEAP TIDES

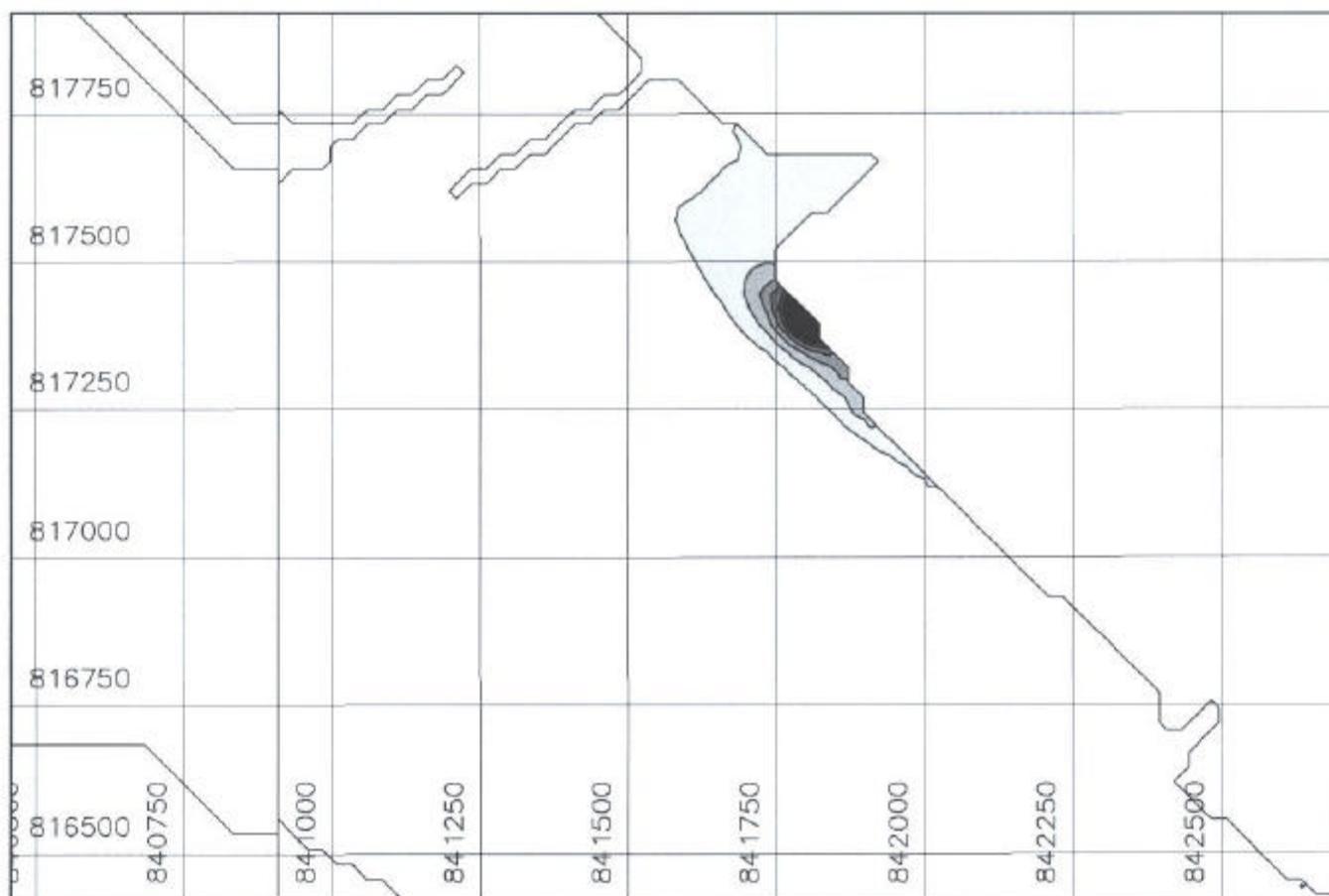
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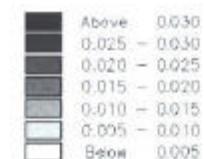
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Figure No. 6D.1



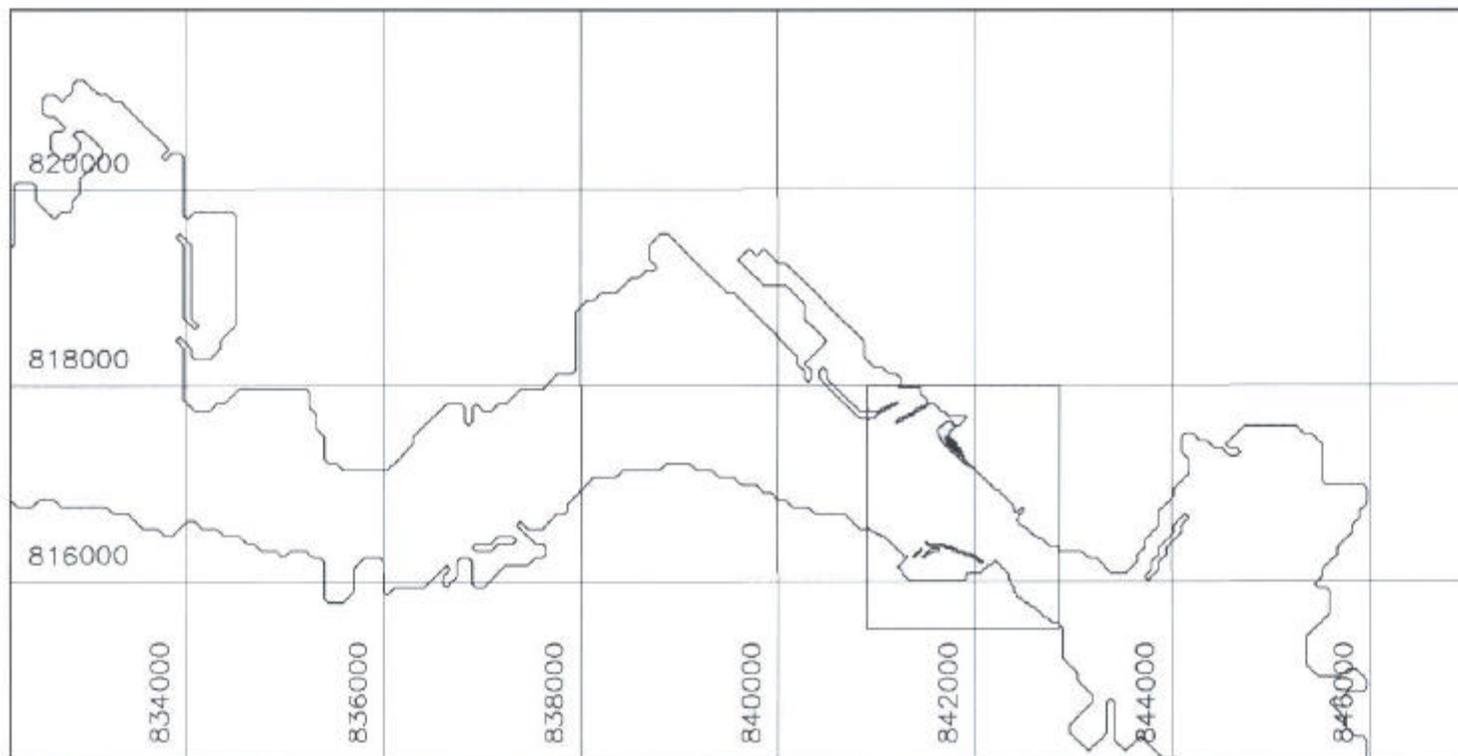
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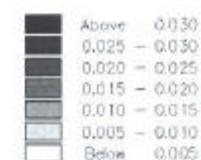
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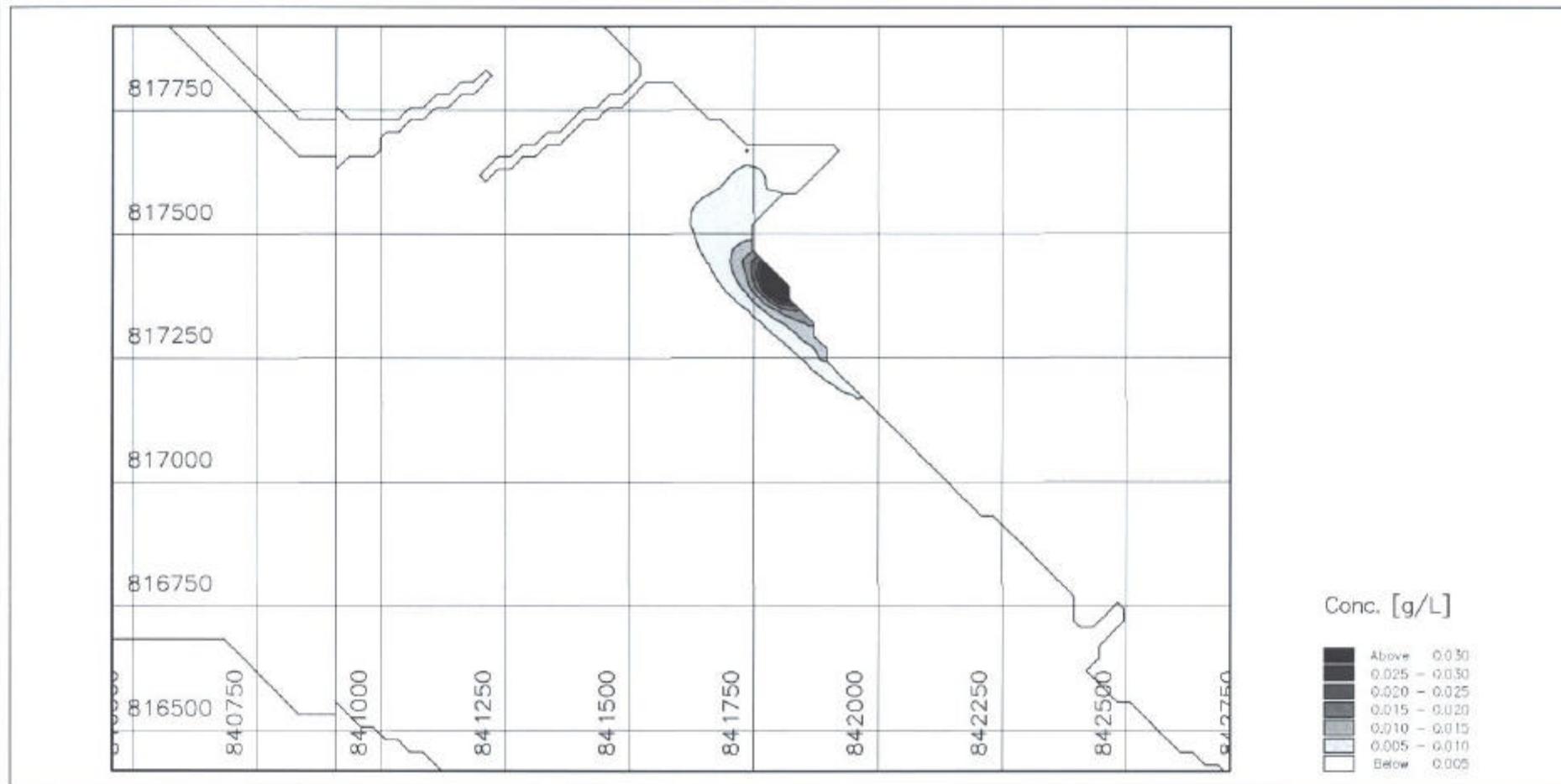
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POLLUTANT CONCENTRATION IN DRY SEASON, SPRING AND NEAP TIDES (ENLARGED)

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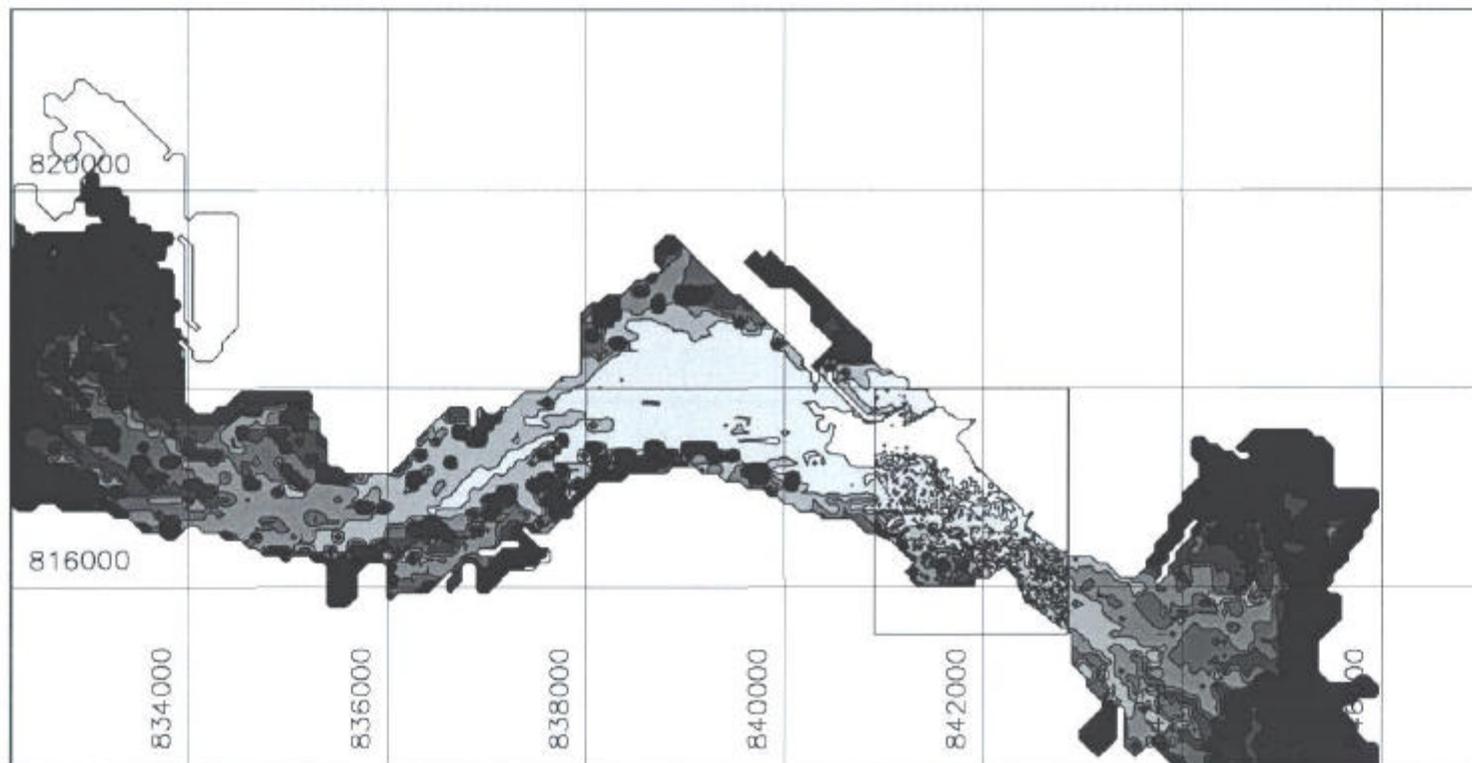




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IMPACT OF THE NEW YTB STORMWATER CULVERT (SCENARIO 1B), TOP 5m LAYER AVERAGED
POLLUTANT CONCENTRATION IN DRY SEASON, SPRING AND NEAP TIDES (ENLARGED)

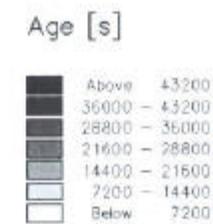
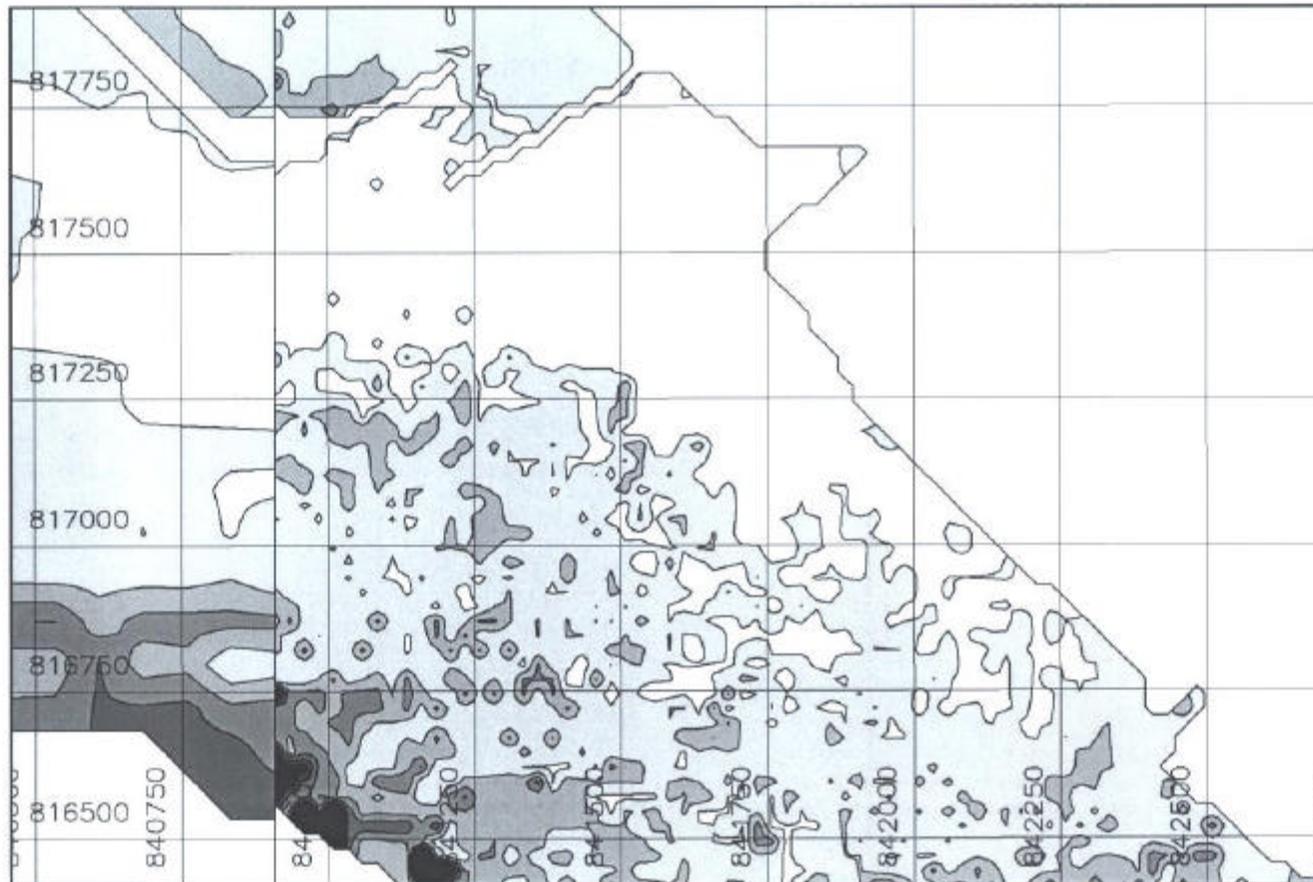
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Fig. No. 6D.4



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IMPACT OF THE NEW YTB STORMWATER CULVERT (SCENARIO 1B), DEPTH AVERAGED
POLLUTANT AGE IN DRY SEASON, SPRING AND NEAP TIDES

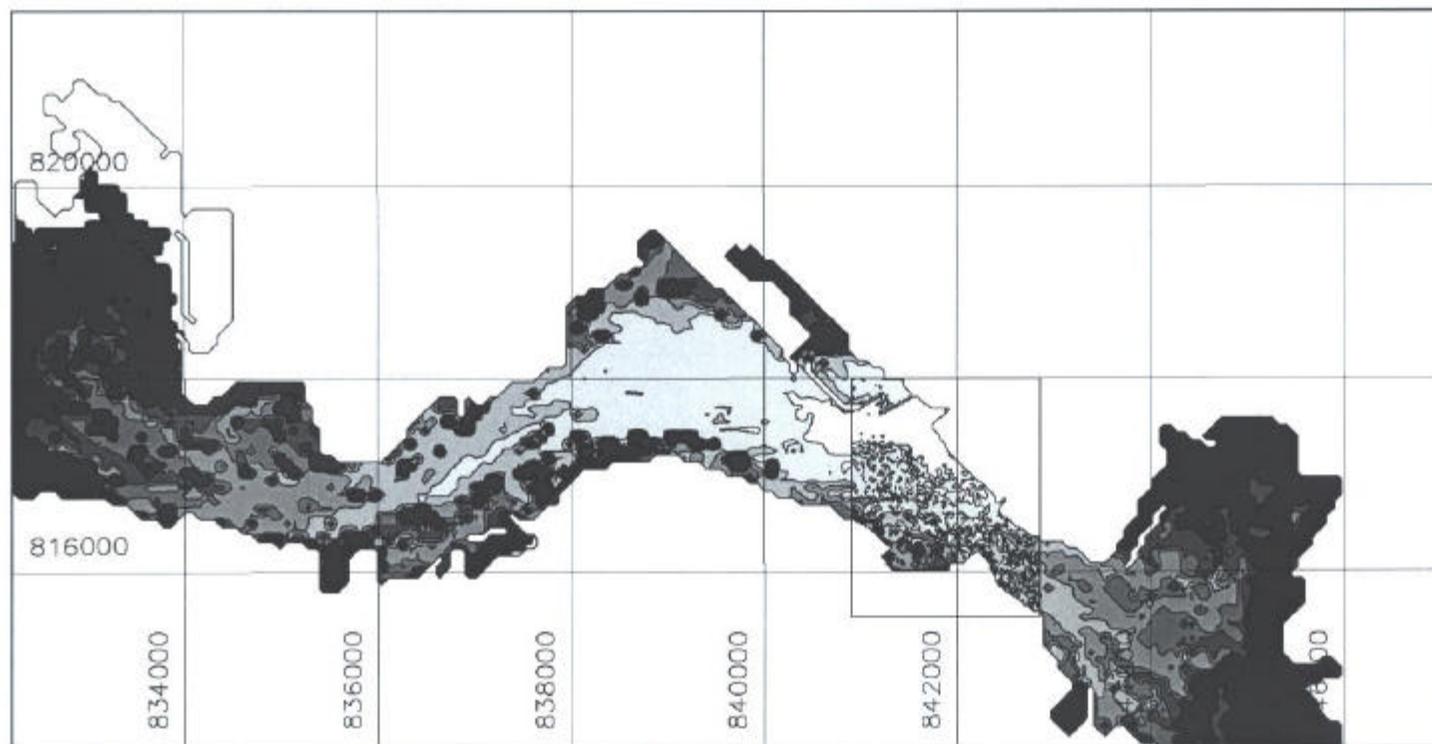
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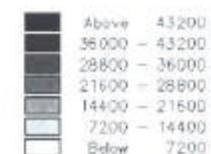
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POLLUTANT AGE IN DRY SEASON, SPRING AND NEAP TIDES (ENLARGED)

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Fig No. 6D.6



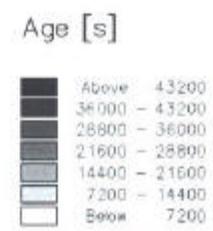
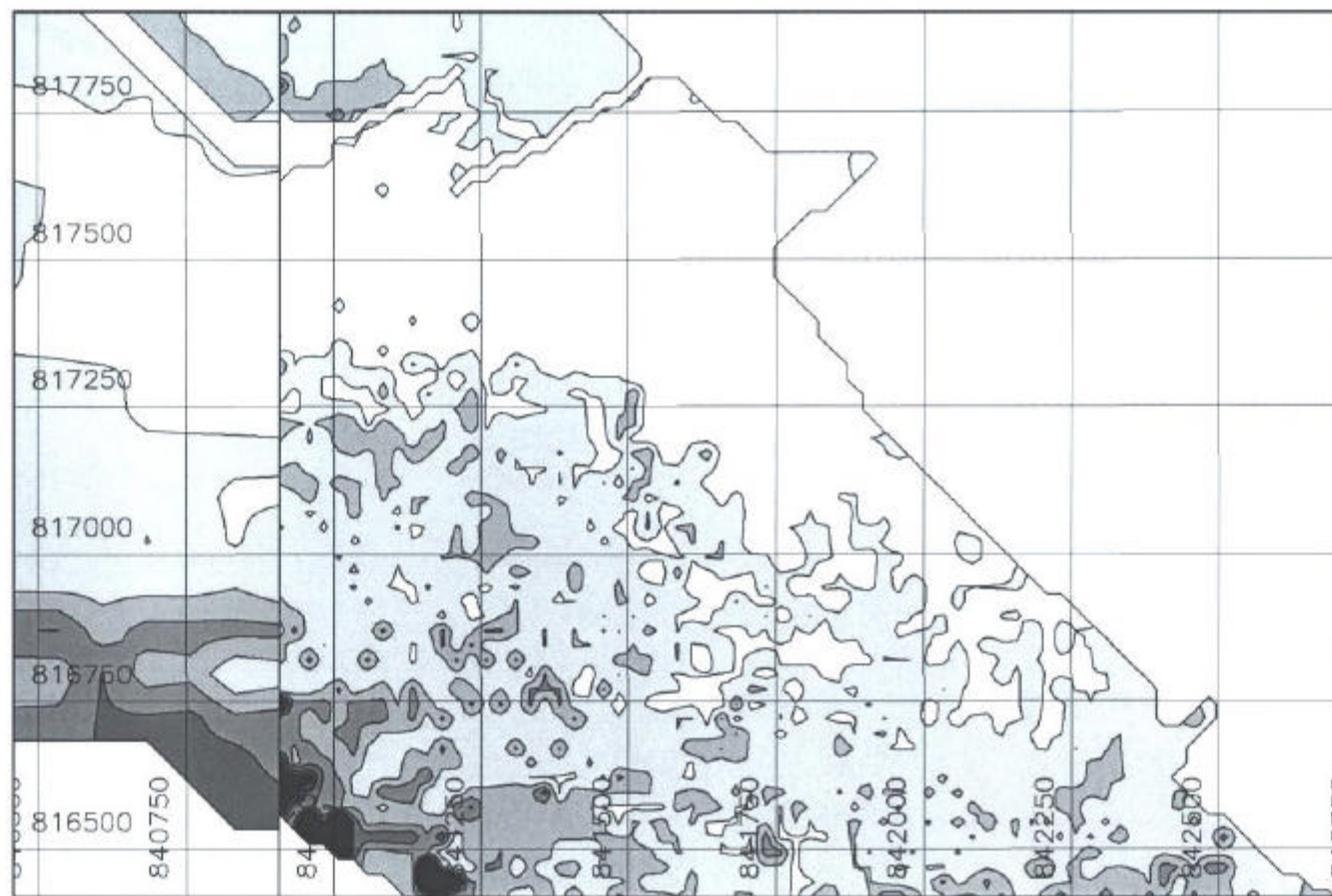
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IMPACT OF THE NEW YTB STORMWATER CULVERT (SCENARIO 1B), TOP 5m LAYER AVERAGED
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Fig No. 6D.8