Inch Cape Offshore Wind Farm

New Energy for Scotland

Offshore Environmental Statement:
VOLUME 2B
Annex 10A.7: Modelled Assessment Plots

REPSOL edp renewables

INCH CAPE OFFSHORE LIMITED

ANNEX10A.7 MODELLED ASSESSMENT PLOTS

TECHNICAL REPORT

Report Reference. Annex10A.7_Rev2

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Rev 1	28/11/12	Revision	PAT	KRM	CPM
Rev 2	24/05/13	Final edits	PAT	KRM	CPM

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d) we would be grateful if you could let us have a copy of the amended report for our files".

FIGURES

This annex includes the results of the assessment of the effect of the proposed developments on the metocean and sediment regimes.

The annex is divided into the following sections:

- The effects due to the Inch Cape development only
- The cumulative impacts from Neart na Gaoithe and the Firth of Forth Round 3 developments, in addition to those from the Inch Cape OWF; and
- The effects from the potential climate change

The effects from the developments are shown as differences, or changes, to key metocean and sediment regime parameters, including water level, current speed, wave height and ultimately the exceedance of the critical shear stress. It is the change in the percentage of time that the critical shear stress is exceeded which most clearly demonstrates the impact of the development(s) on the sediment regime. An additional set of plot (Figure 10A.7.119) shows any changes to the far-field suspended sediment transport pathways.

Differences are calculated by subtracting the results from the baseline model runs from the same results obtained from the impact assessment model runs.

Therefore positive values (shown in the orange/brown colour range) indicate an increase (in the parameter) due to the development(s), and negative differences (shown in the pink/purple colour range) indicate a decrease in the presented parameter.

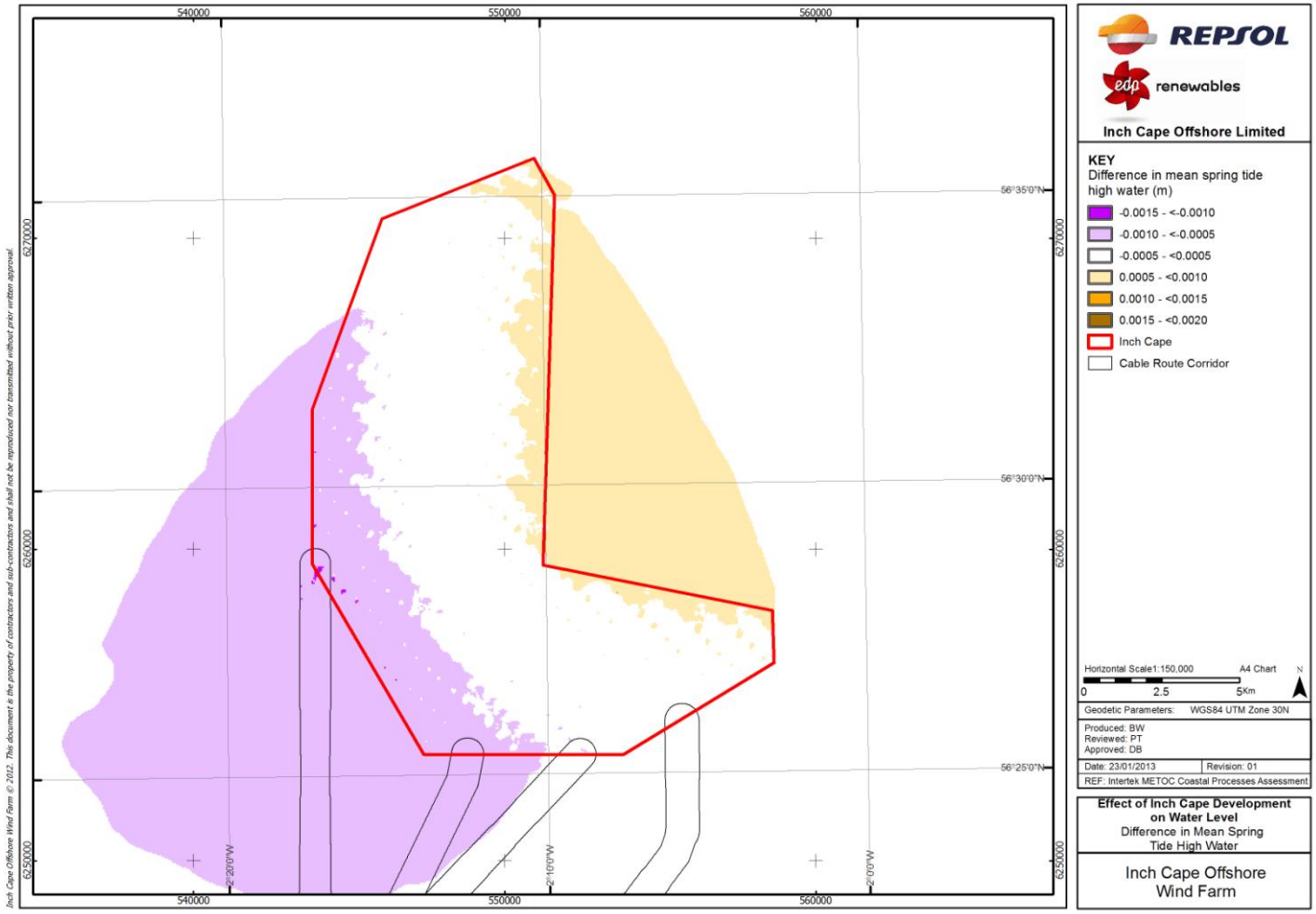
Finally, where possible the same contour banding has been used for the set of plots for each parameter (i.e. for the differences to 50, 90, 95 and 99%ile significant wave height), to allow easy comparison. This means that on some plots only one or two contour colours are presented.

Effects due to the Inch Cape Development

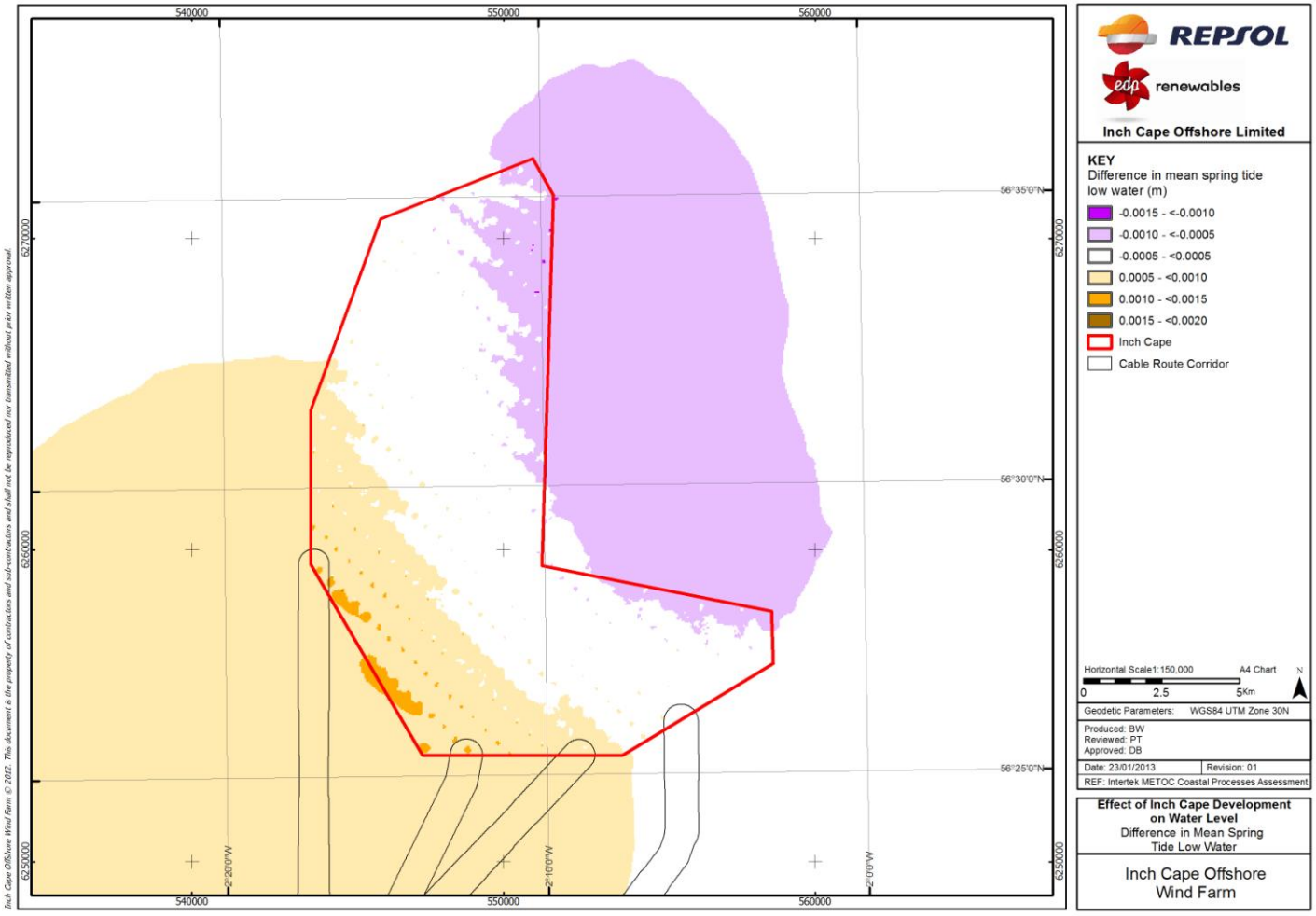
Effects are shown for the hydrodynamic regime, then the wave climate, and then the sediment regime. Near-field changes are shown first for each regime, followed by the regional, or far-field impacts.

Hydrodynamic regime

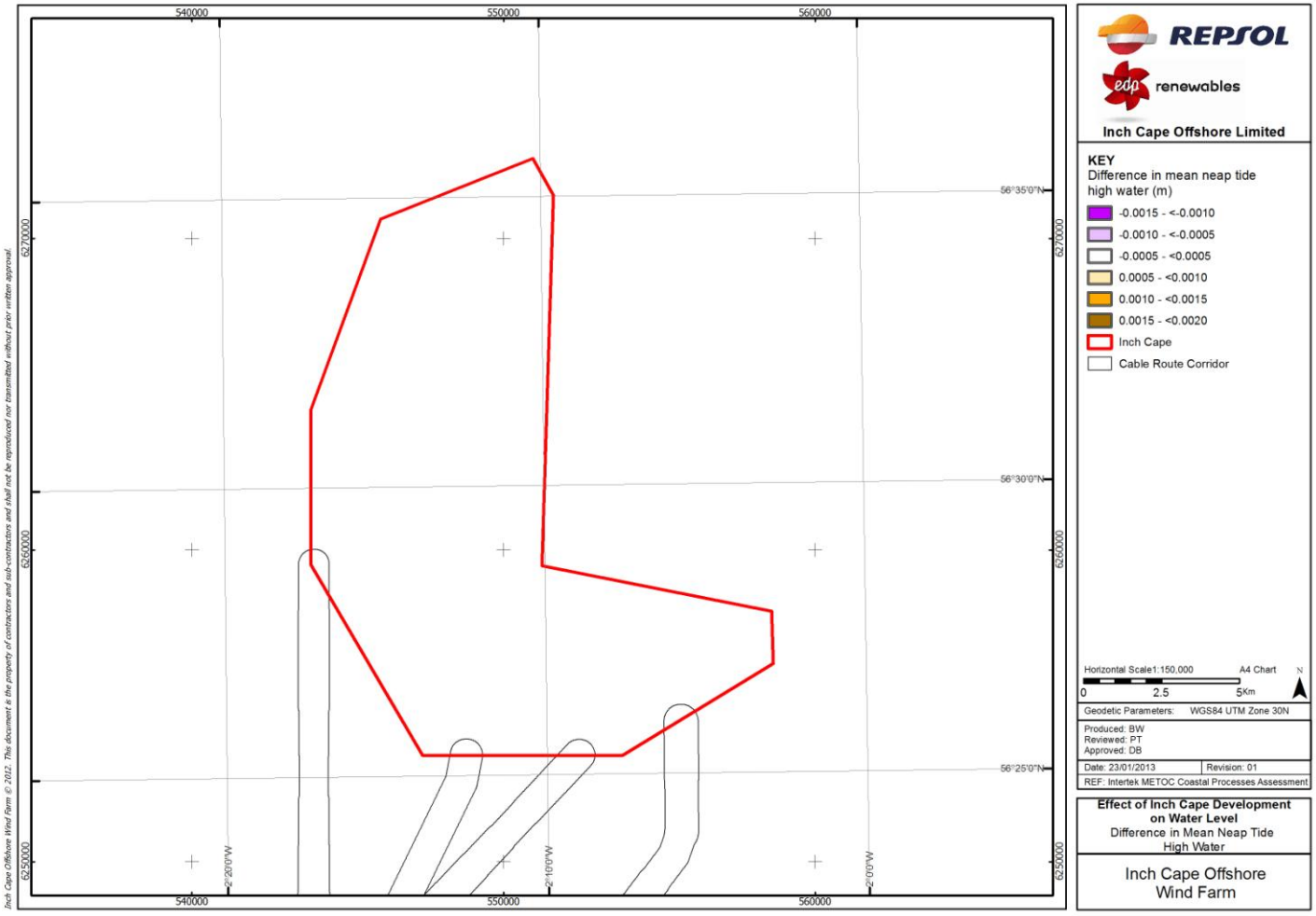
10A.7.1 : Difference in mean spring tide high water (HW) level (m) – near-field



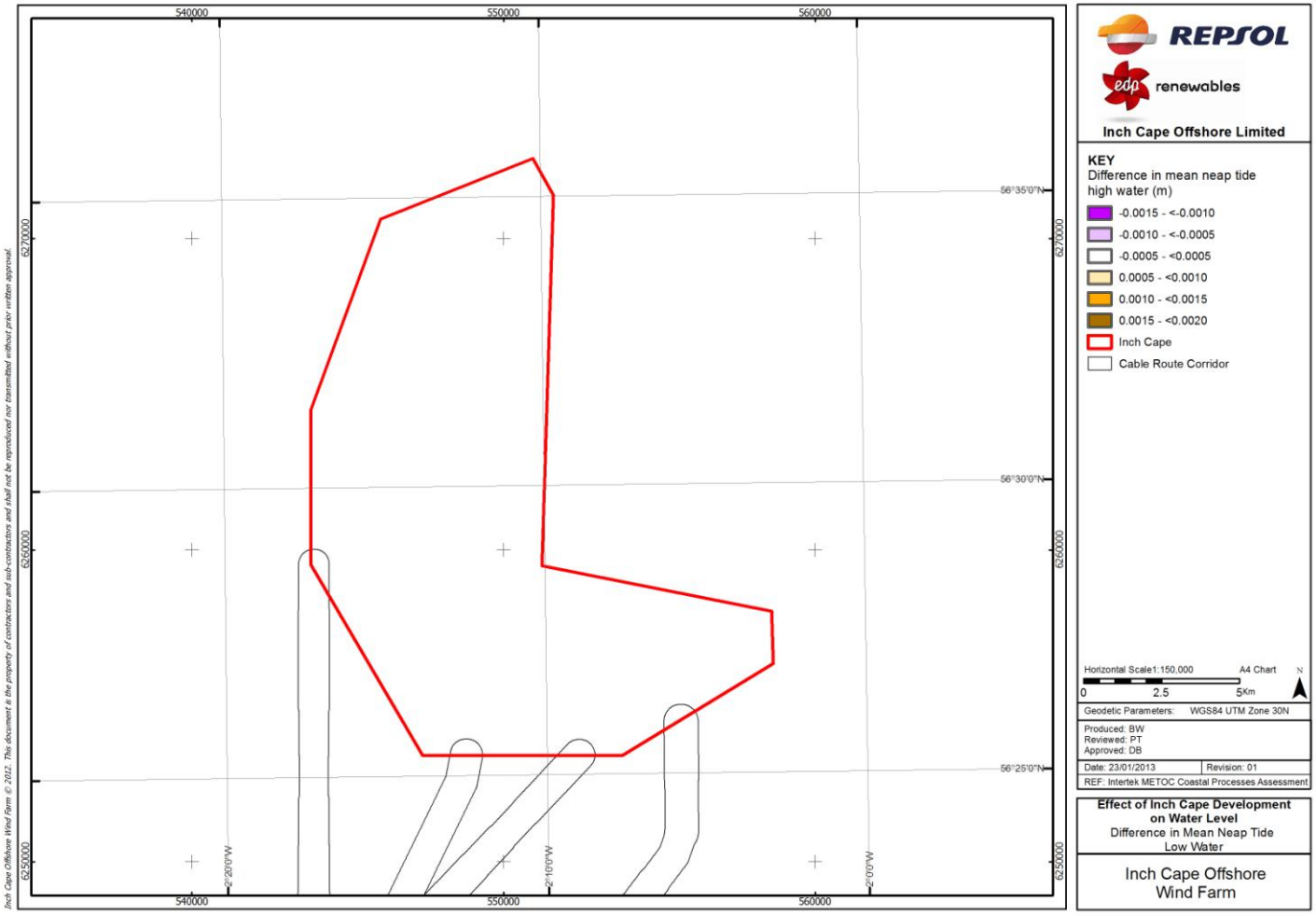
10A.7.2: Difference in mean spring tide low water (LW) level (m) – near-field



10A.7.3: Difference in mean neap tide high water (LW) level (m) – near-field



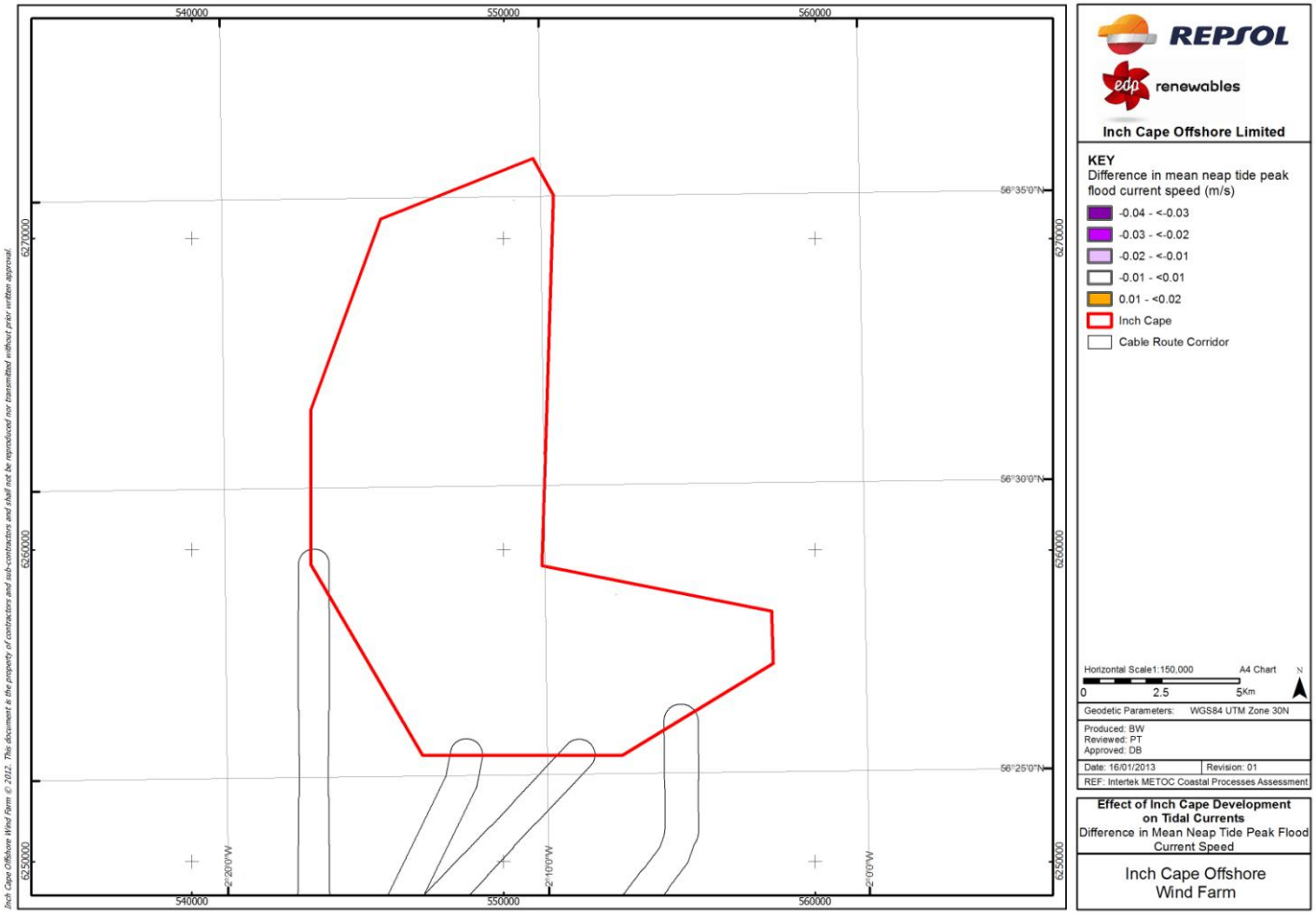
10A.7.4: Difference in mean neap tide low water (LW) level (m) – near-field



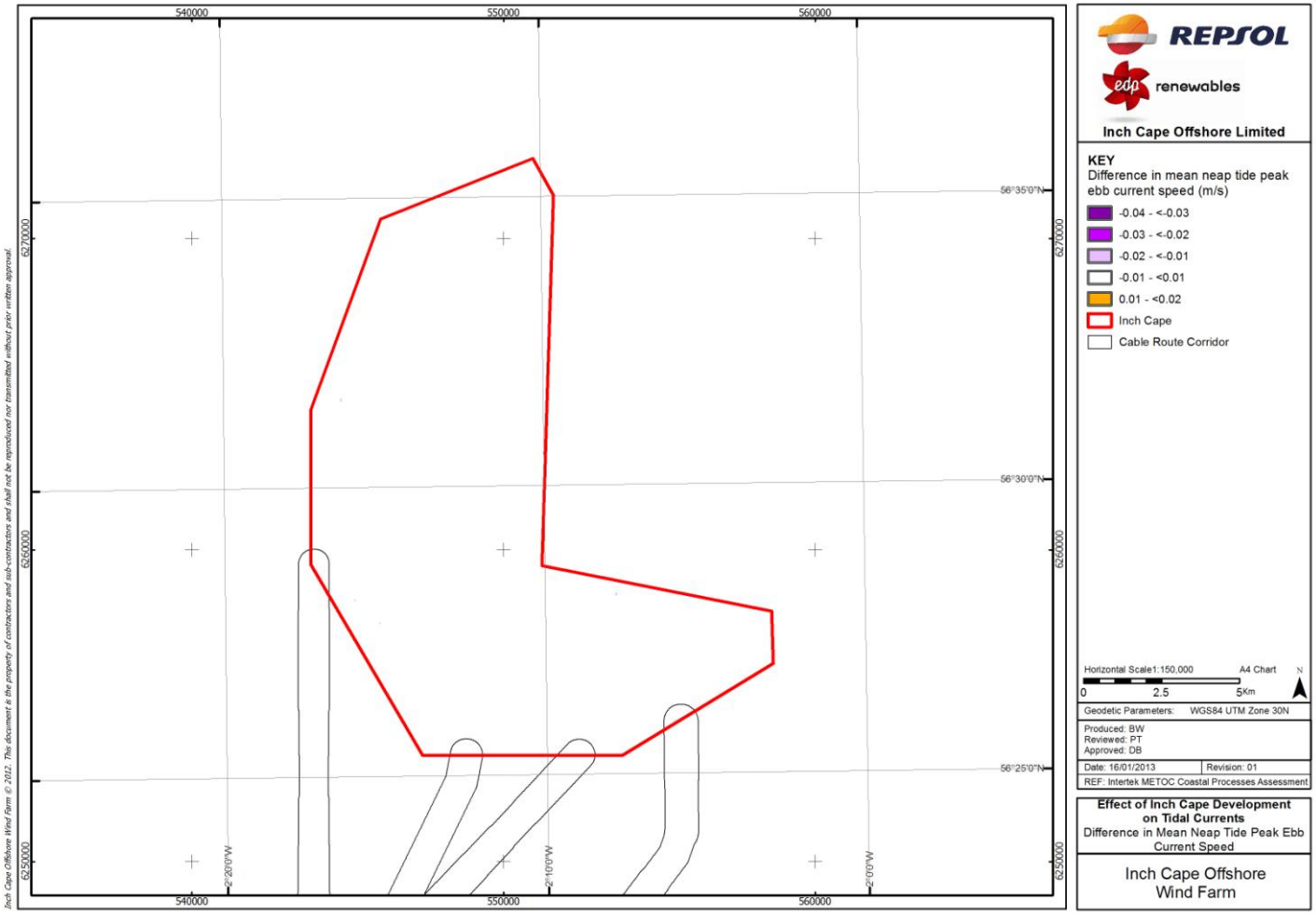
10A.7.5: Difference in mean spring tide peak flood current speed (m/s) – near-field

10A.7.6: Difference in mean spring tide peak ebb current speed (m/s) – near-field

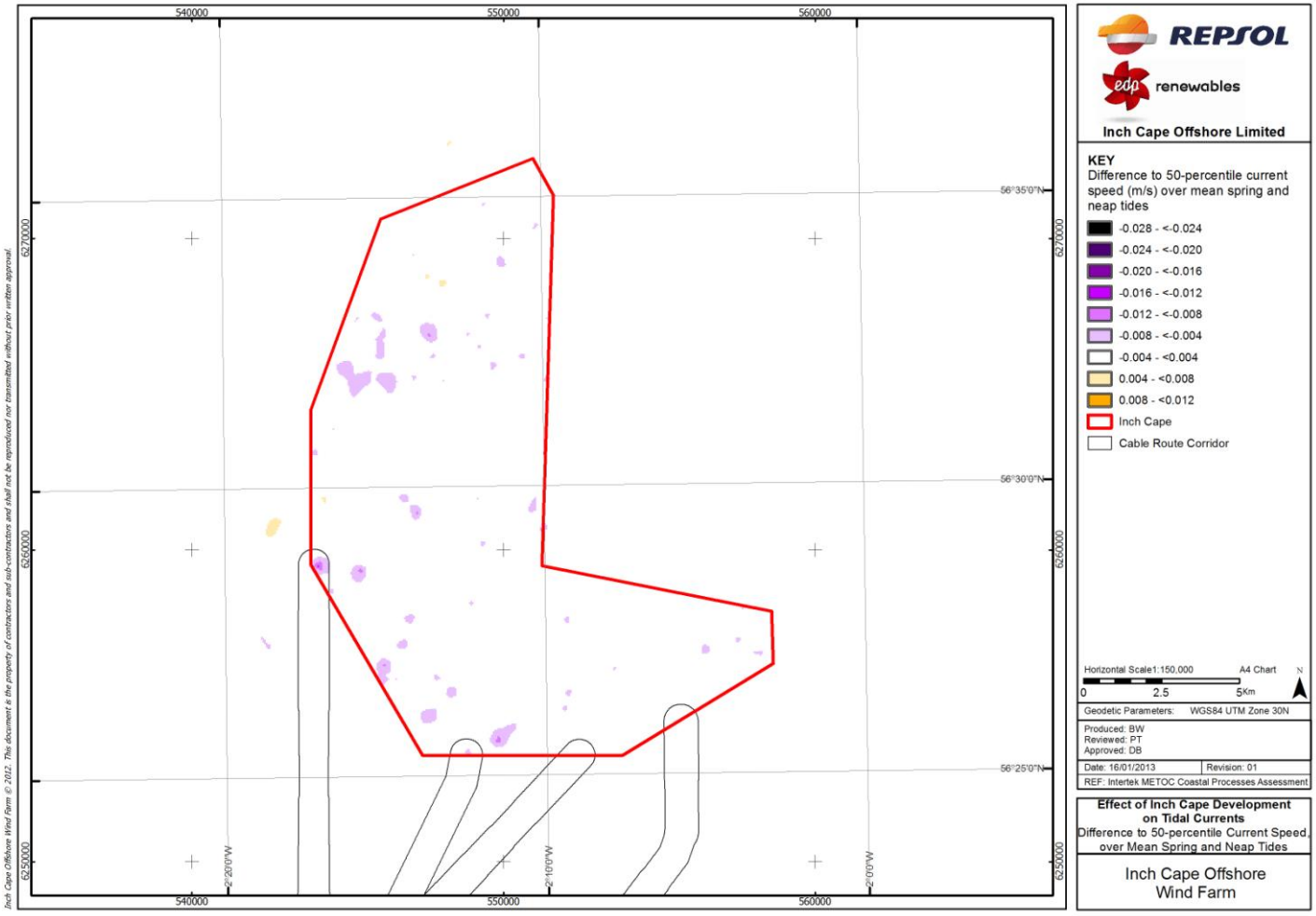
10A.7.7: Difference in mean neap tide peak flood current speed (m/s) – near-field



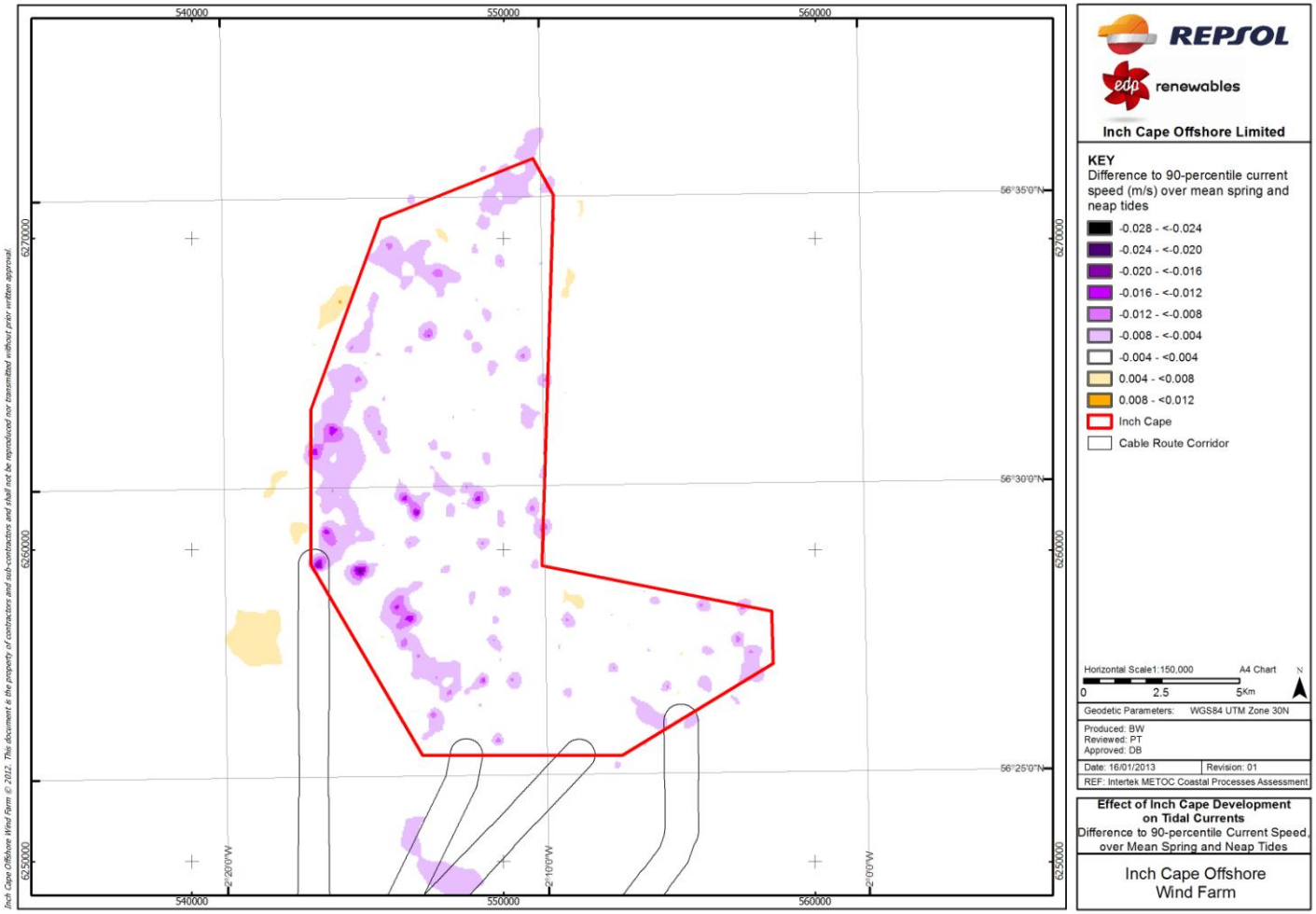
10A.7.8: Difference in mean neap tide peak ebb current speed (m/s) – near-field



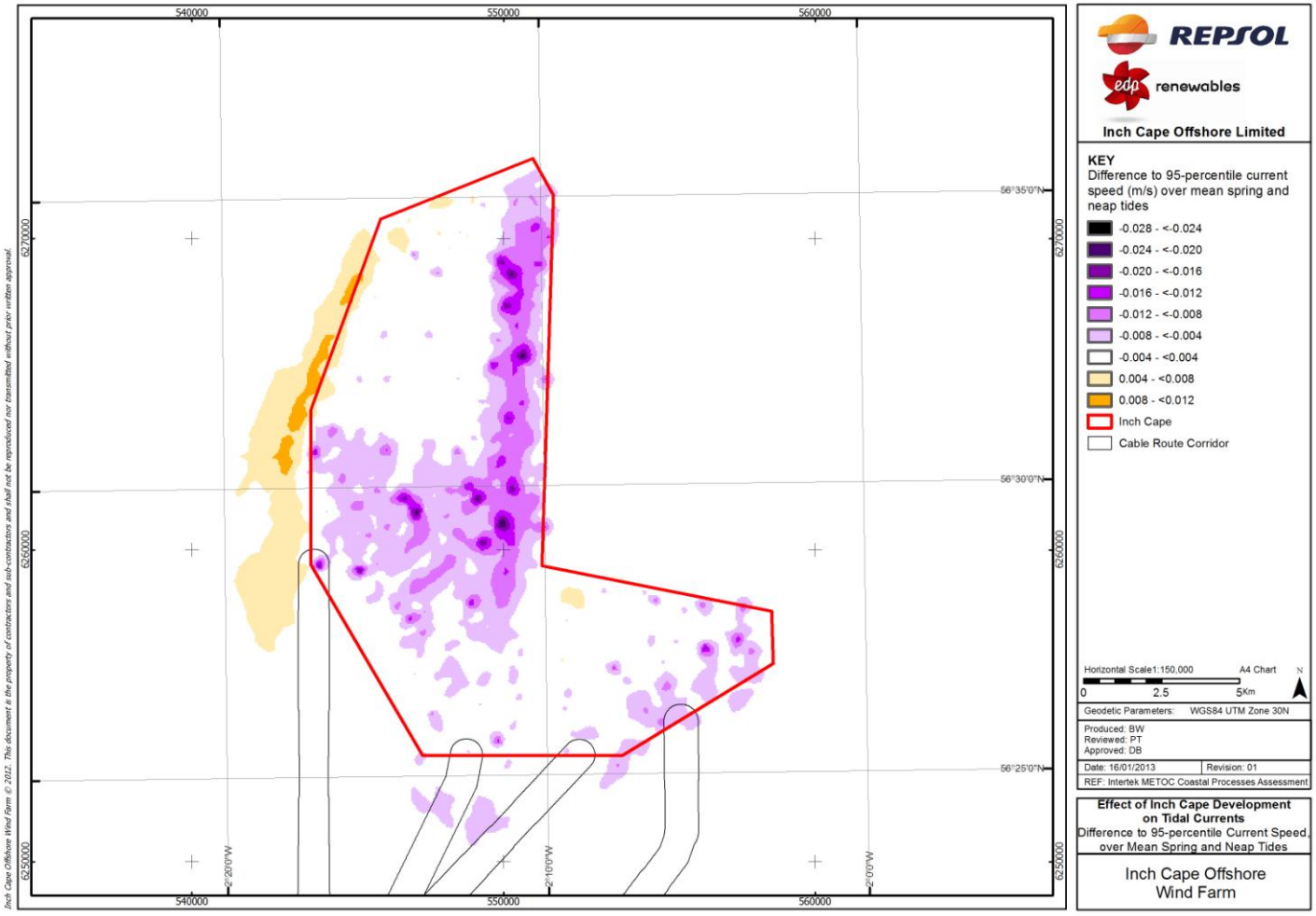
10A.7.9: Difference in the 50-percentile current speed (m/s) – near-field



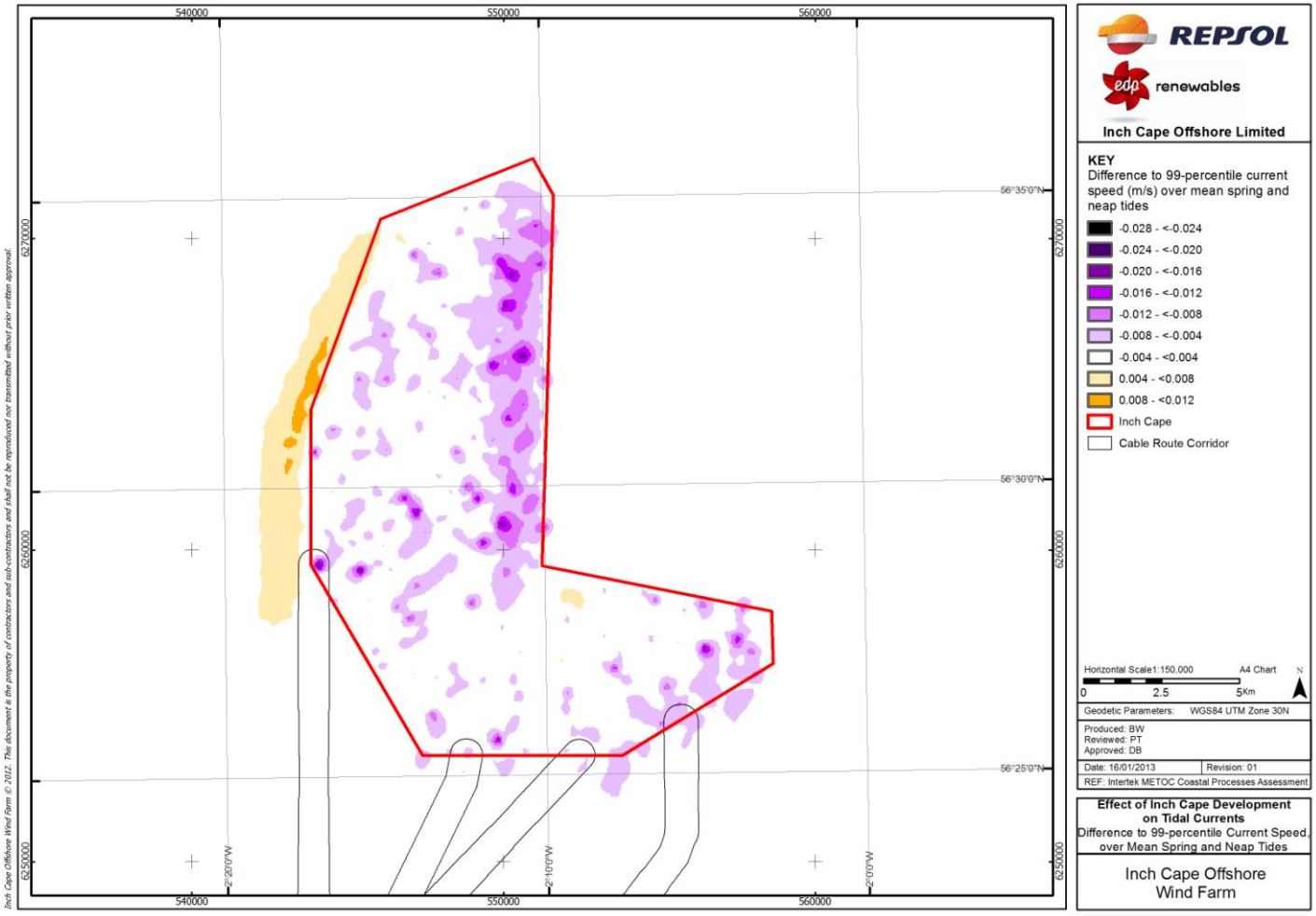
10A.7.10: Difference in the 90-percentile current speed (m/s) – near-field



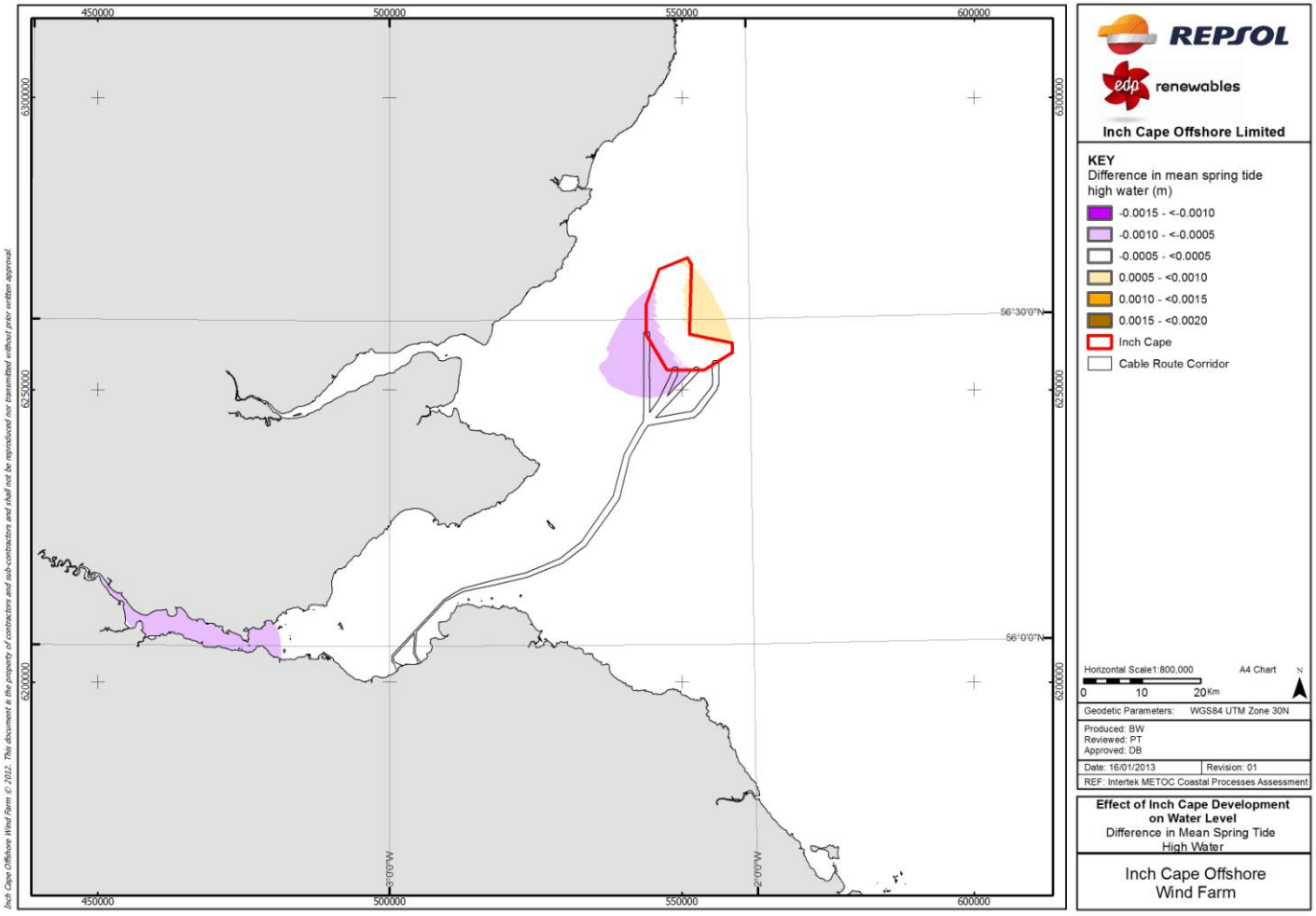
10A.7.11: Difference in the 95-percentile current speed (m/s) – near-field



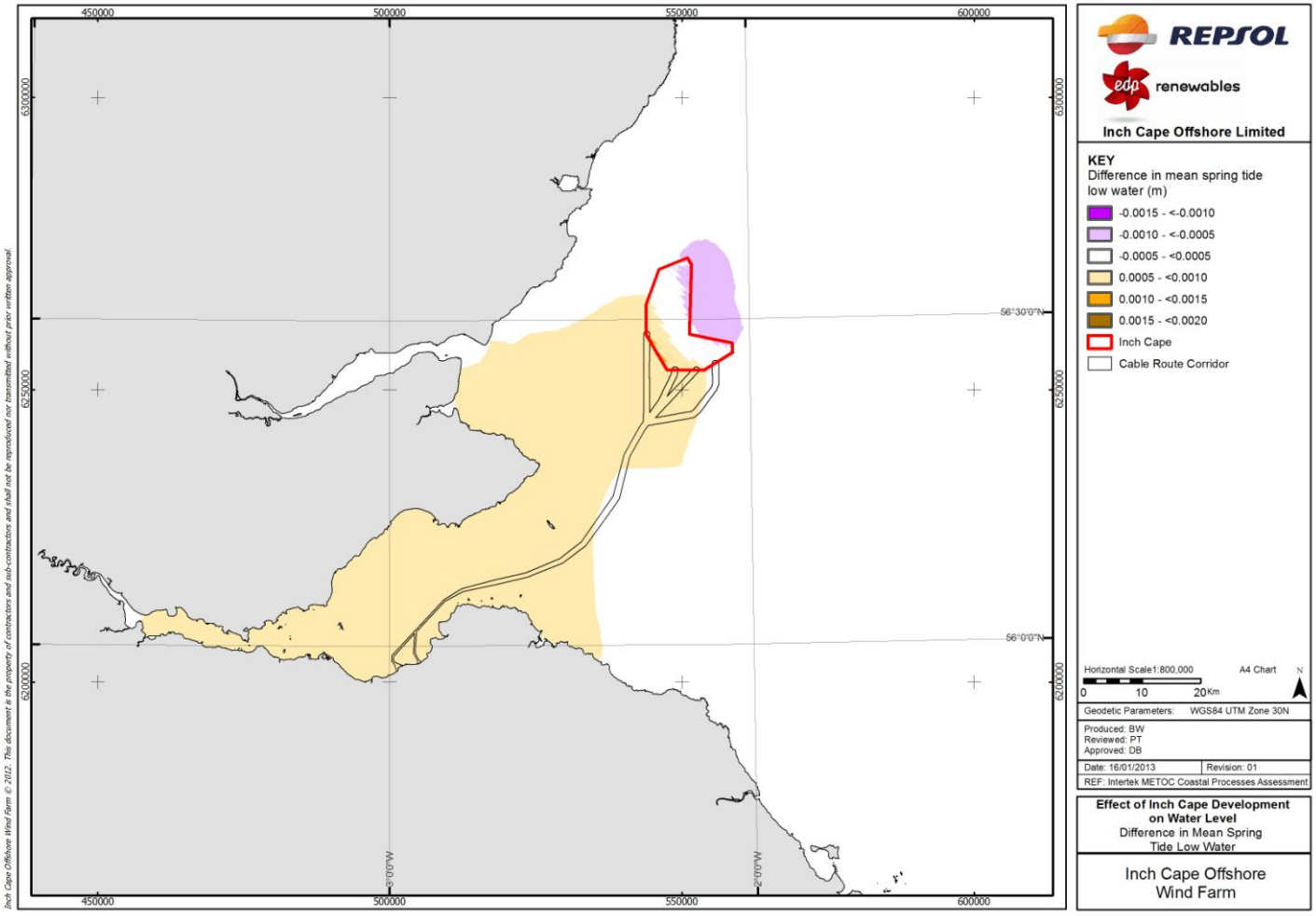
10A.7.12: Difference in the 99-percentile current speed (m/s) – near-field



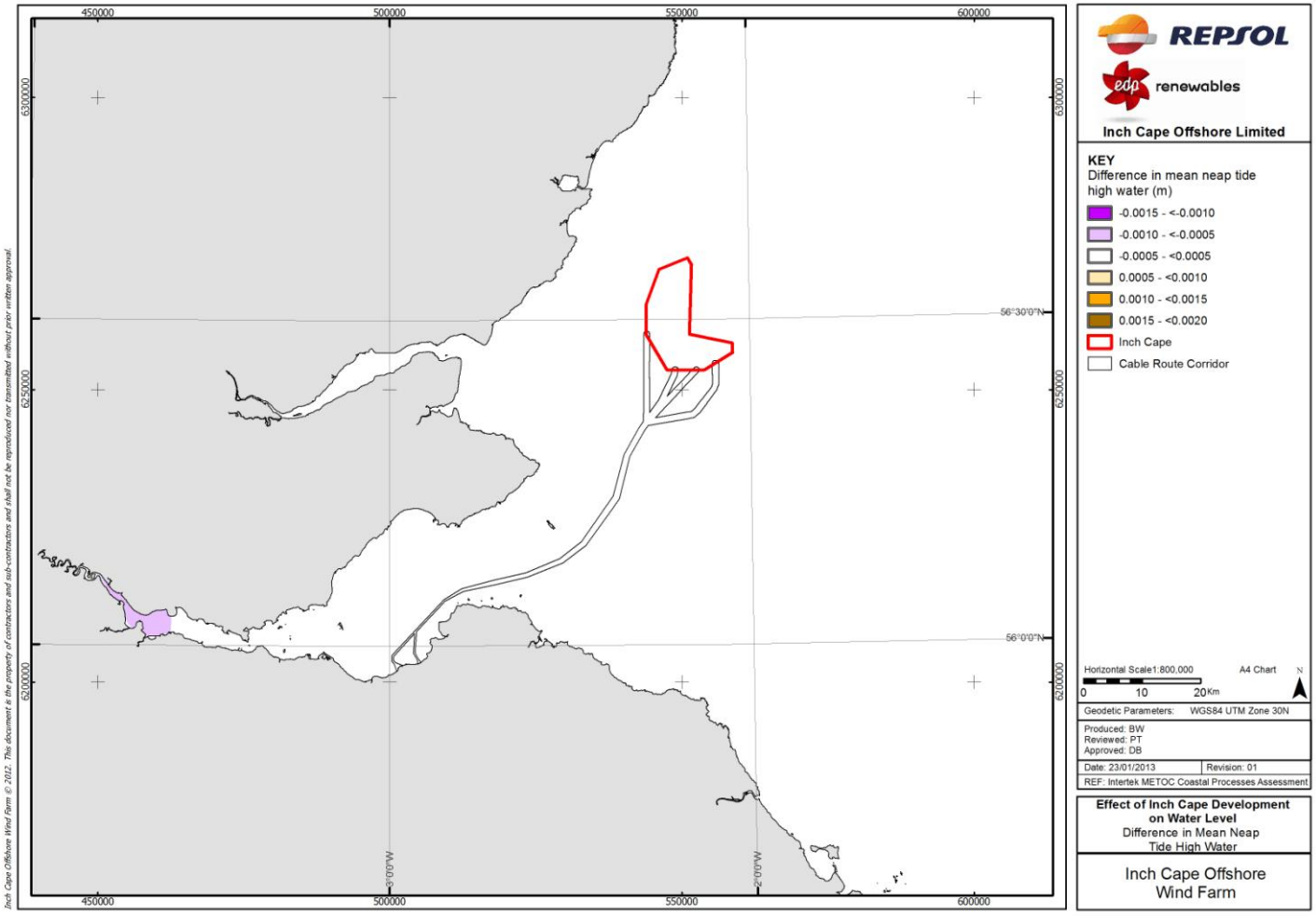
10A.7.13: Difference in mean spring tide high water (HW) level (m) – far-field



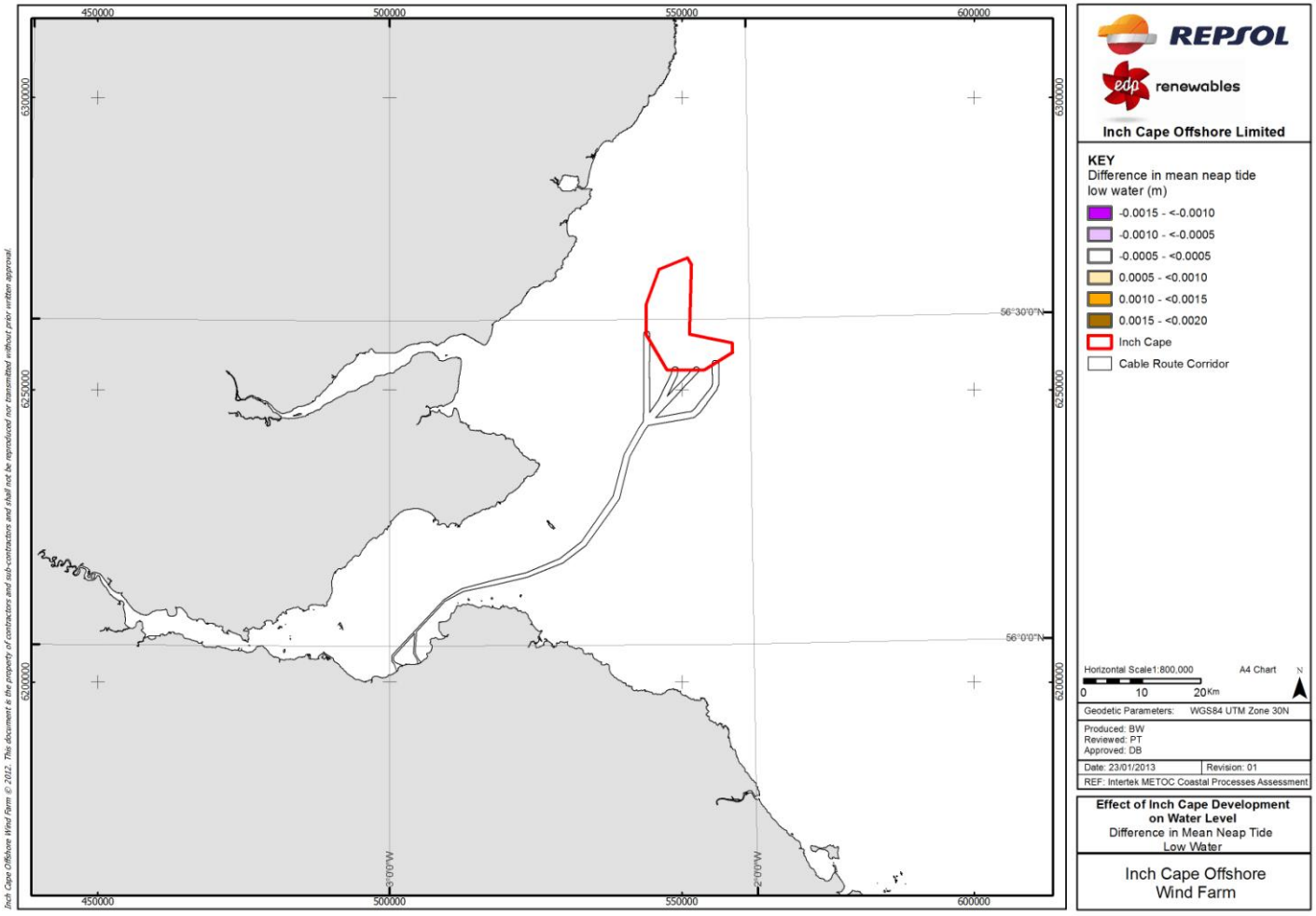
10A.7.14: Difference in mean spring tide low water (LW) level (m) – far-field



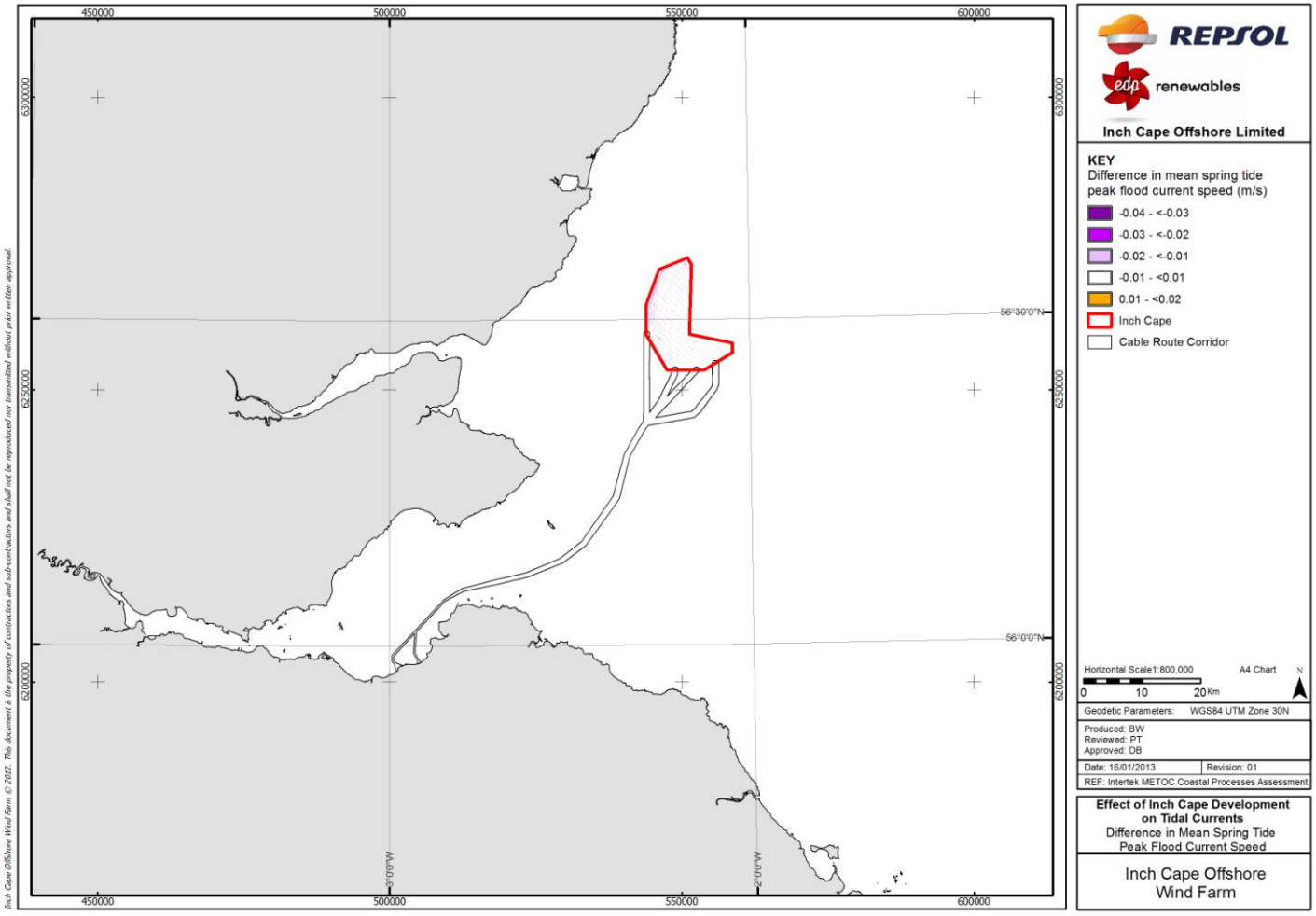
10A.7.15: Difference in mean neap tide high water (HW) level (m) – far-field



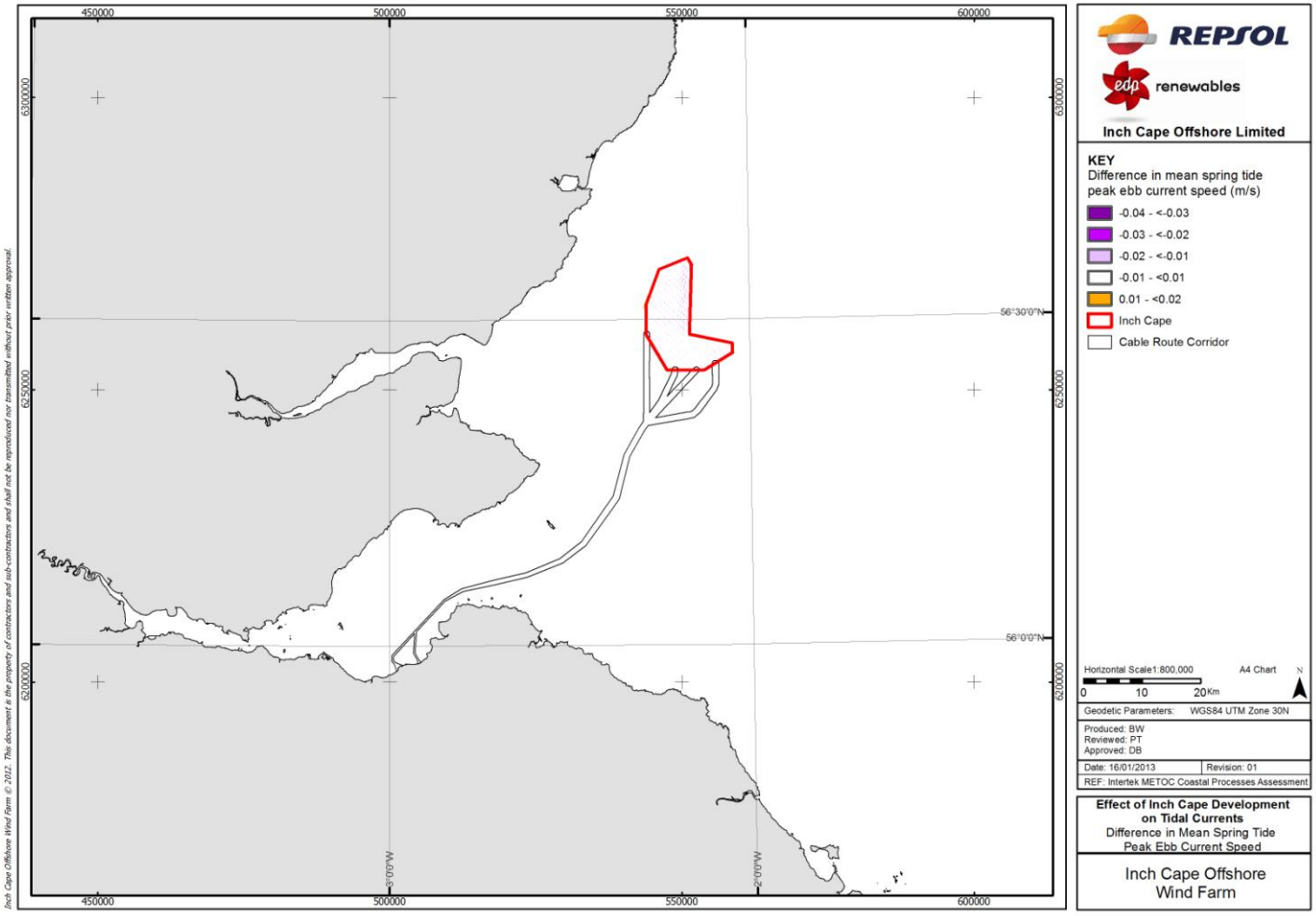
10A.7.16: Difference in mean neap tide low water (LW) level (m) – far-field



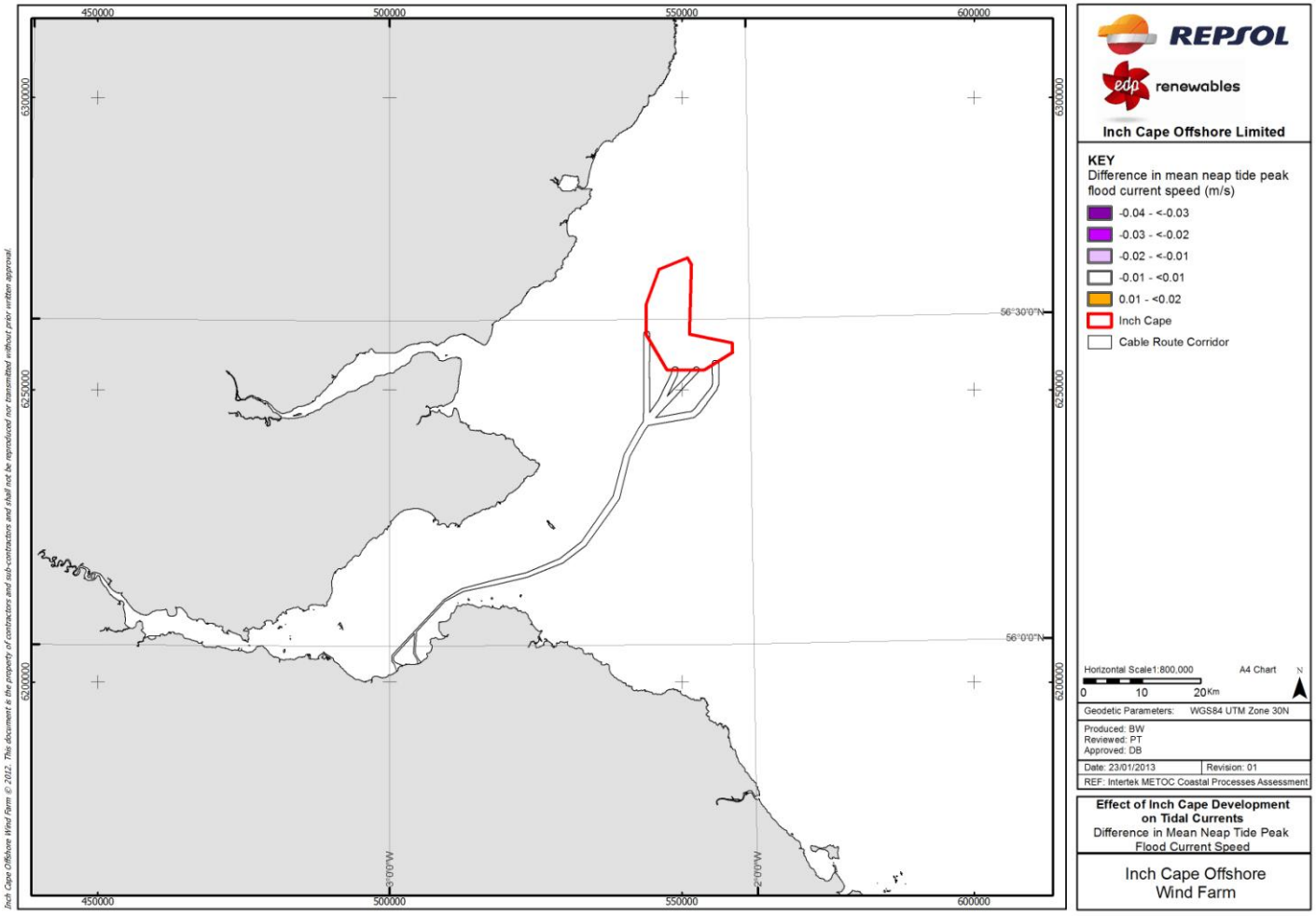
10A.7.17: Difference in mean spring tide peak flood current speed (m/s) – far-field



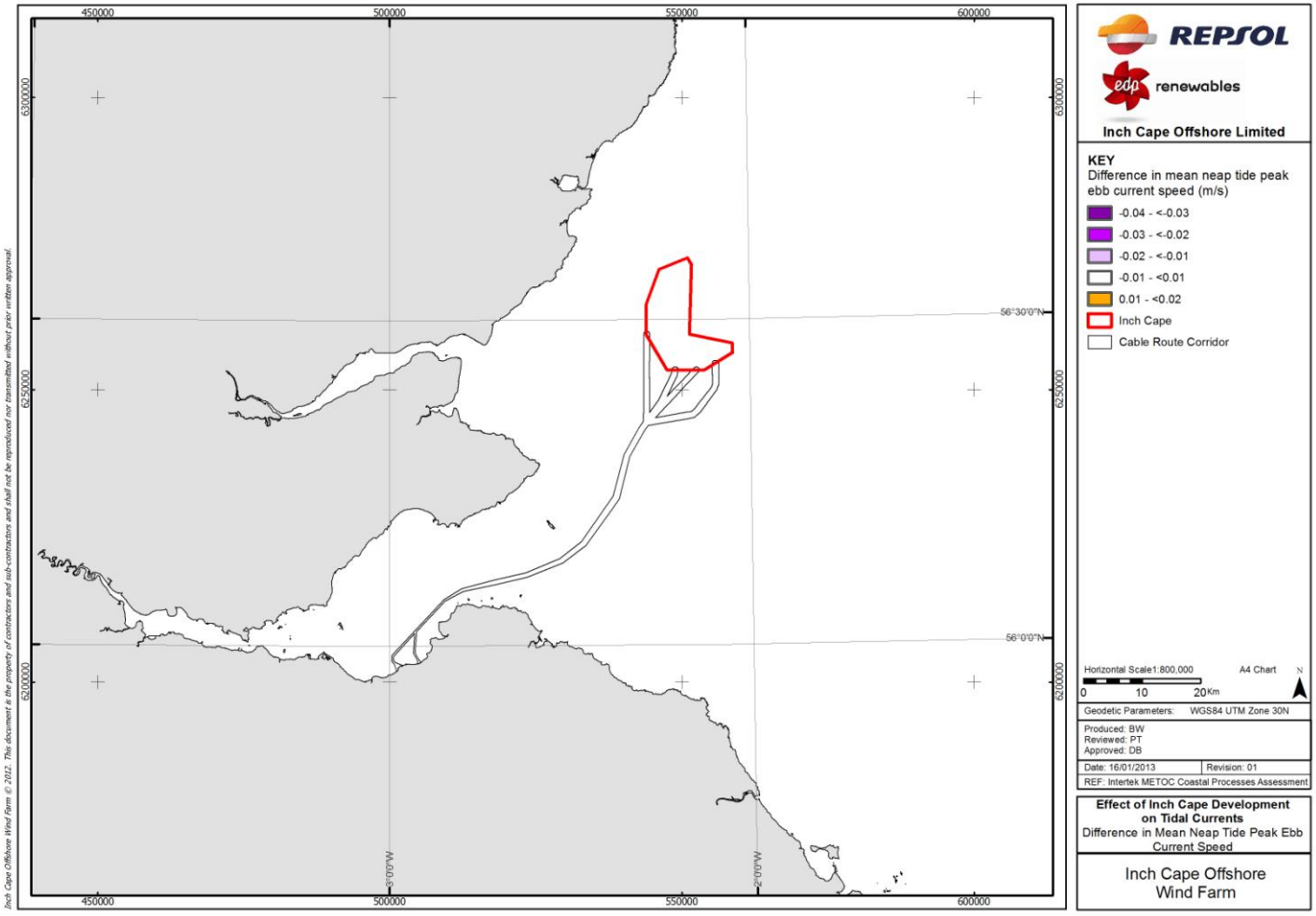
10A.7.18: Difference in mean spring tide peak ebb current speed (m/s) – far-field



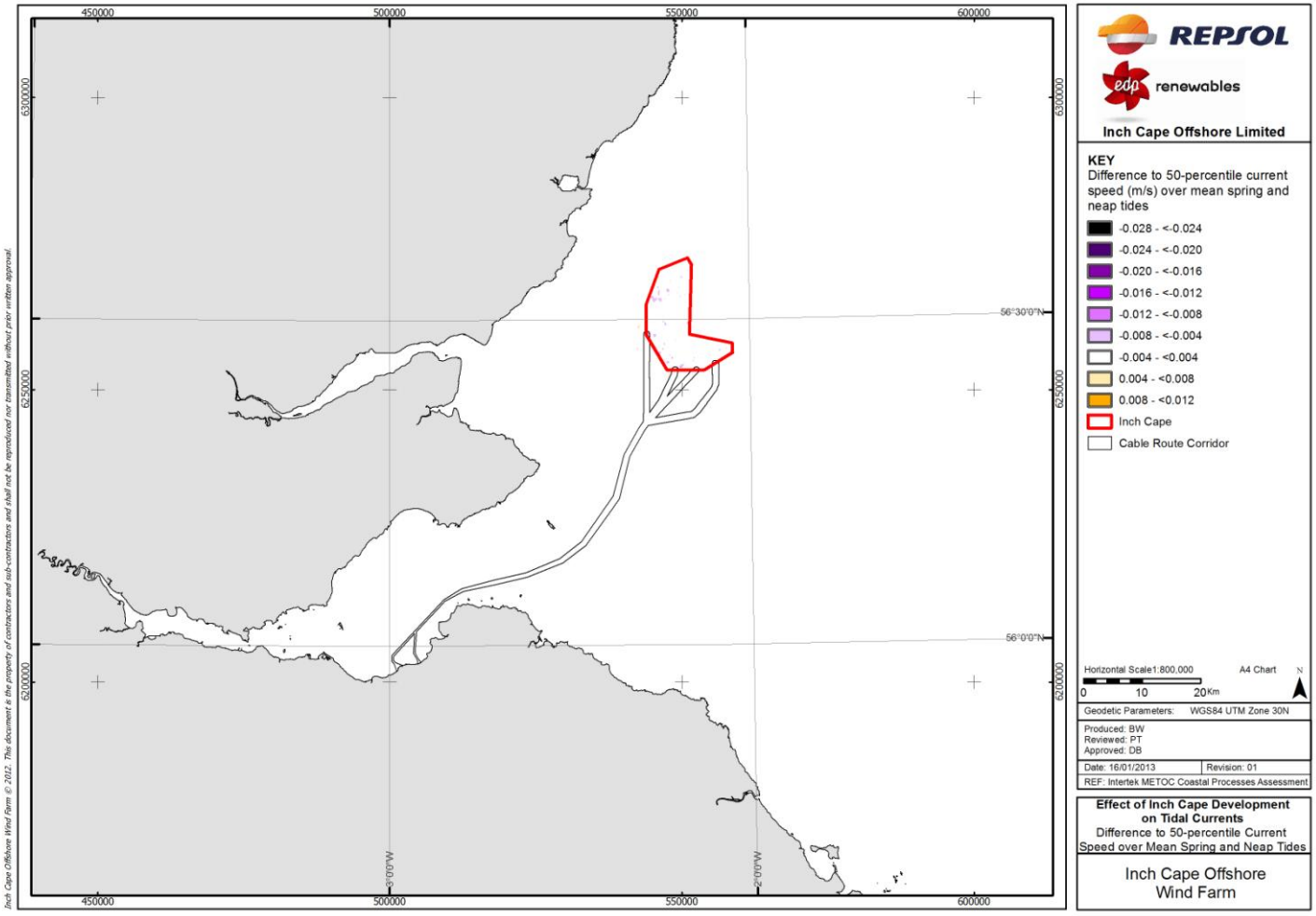
10A.7.19: Difference in mean neap tide peak flood current speed (m/s) – far-field



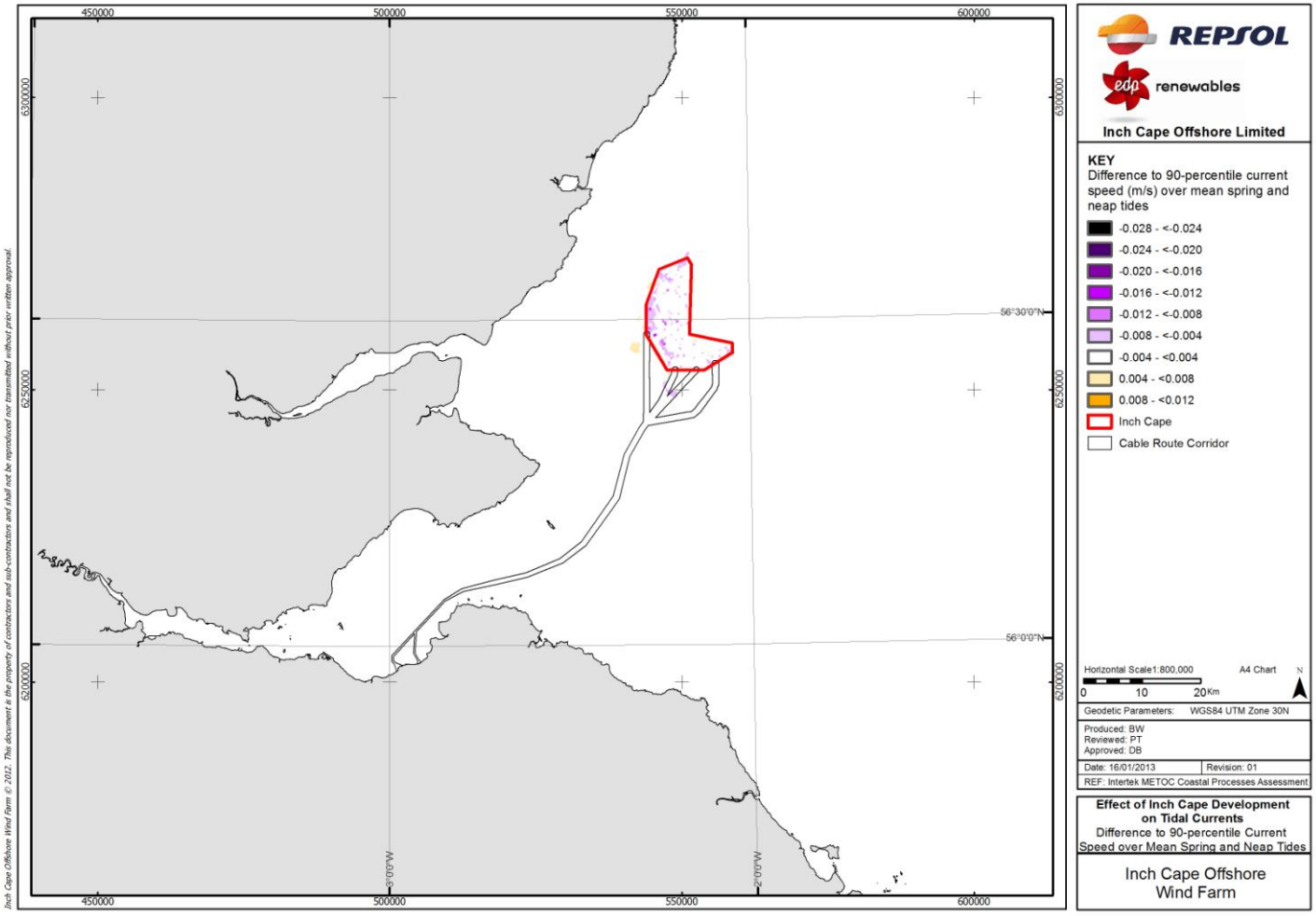
10A.7.20: Difference in mean neap tide peak ebb current speed (m/s) – far-field



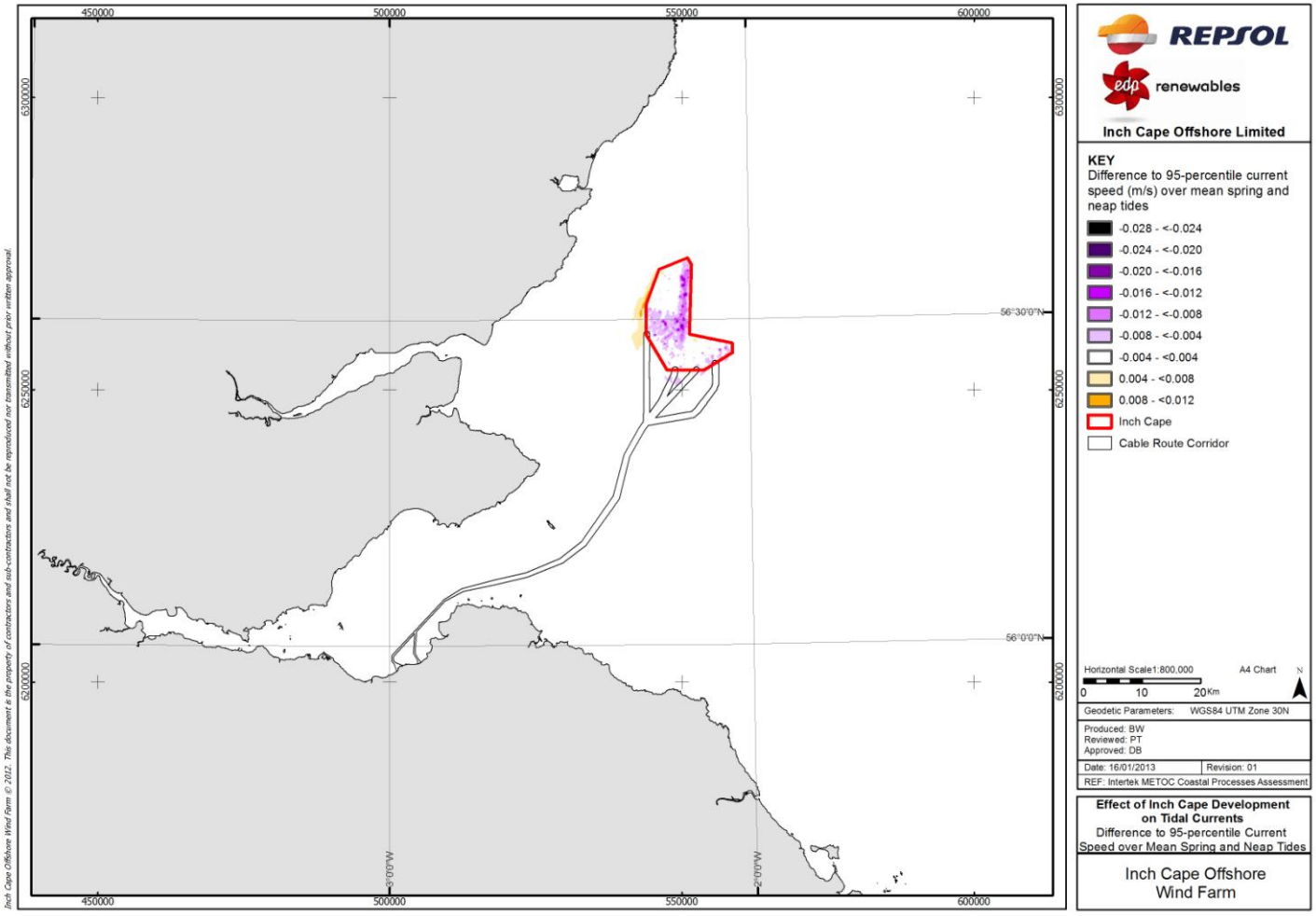
10A.7.21: Difference in 50-percentile current speed (m/s) – far-field



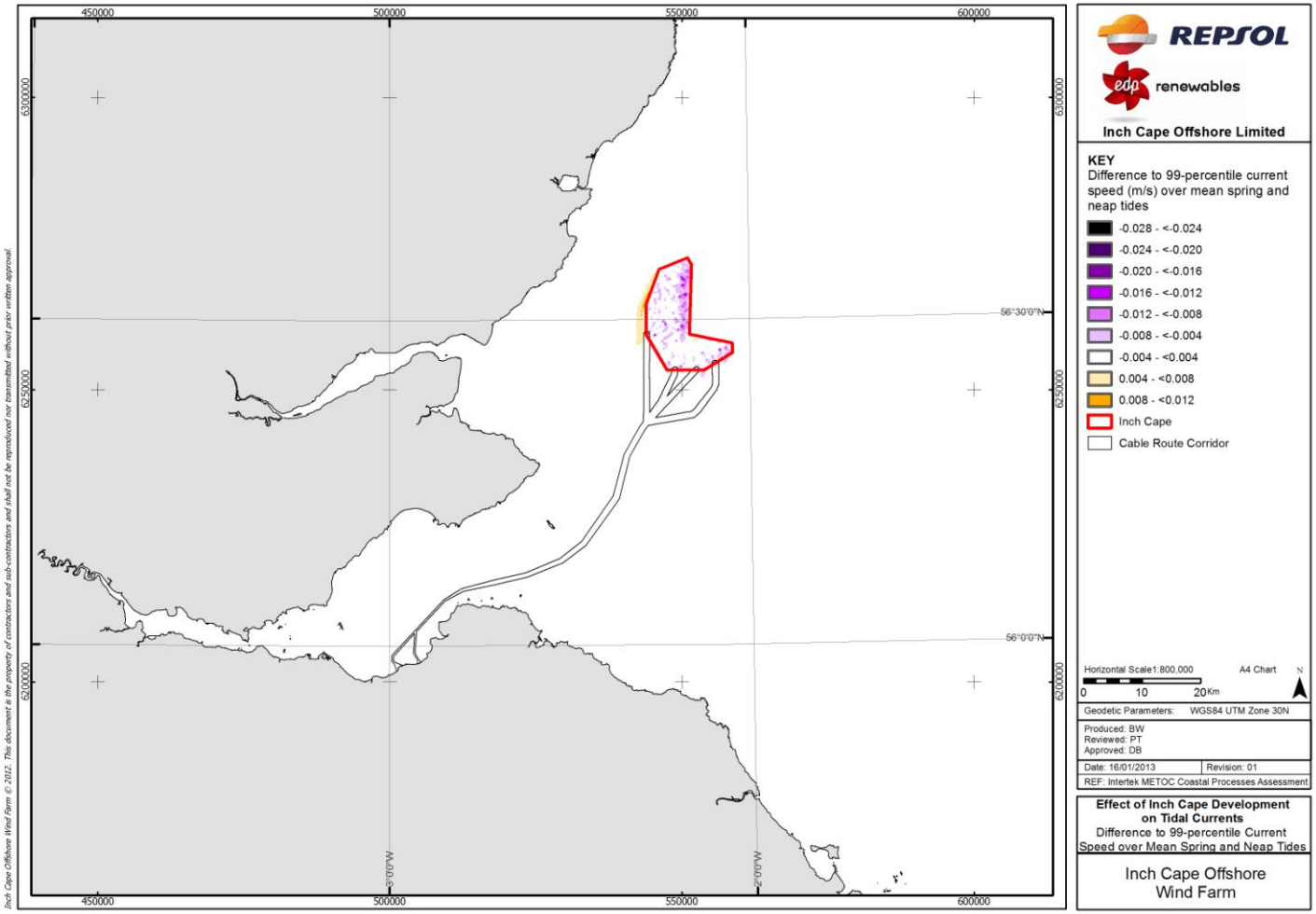
10A.7.22: Difference in 90-percentile current speed (m/s) – far-field



10A.7.23: Difference in 95-percentile current speed (m/s) – far-field

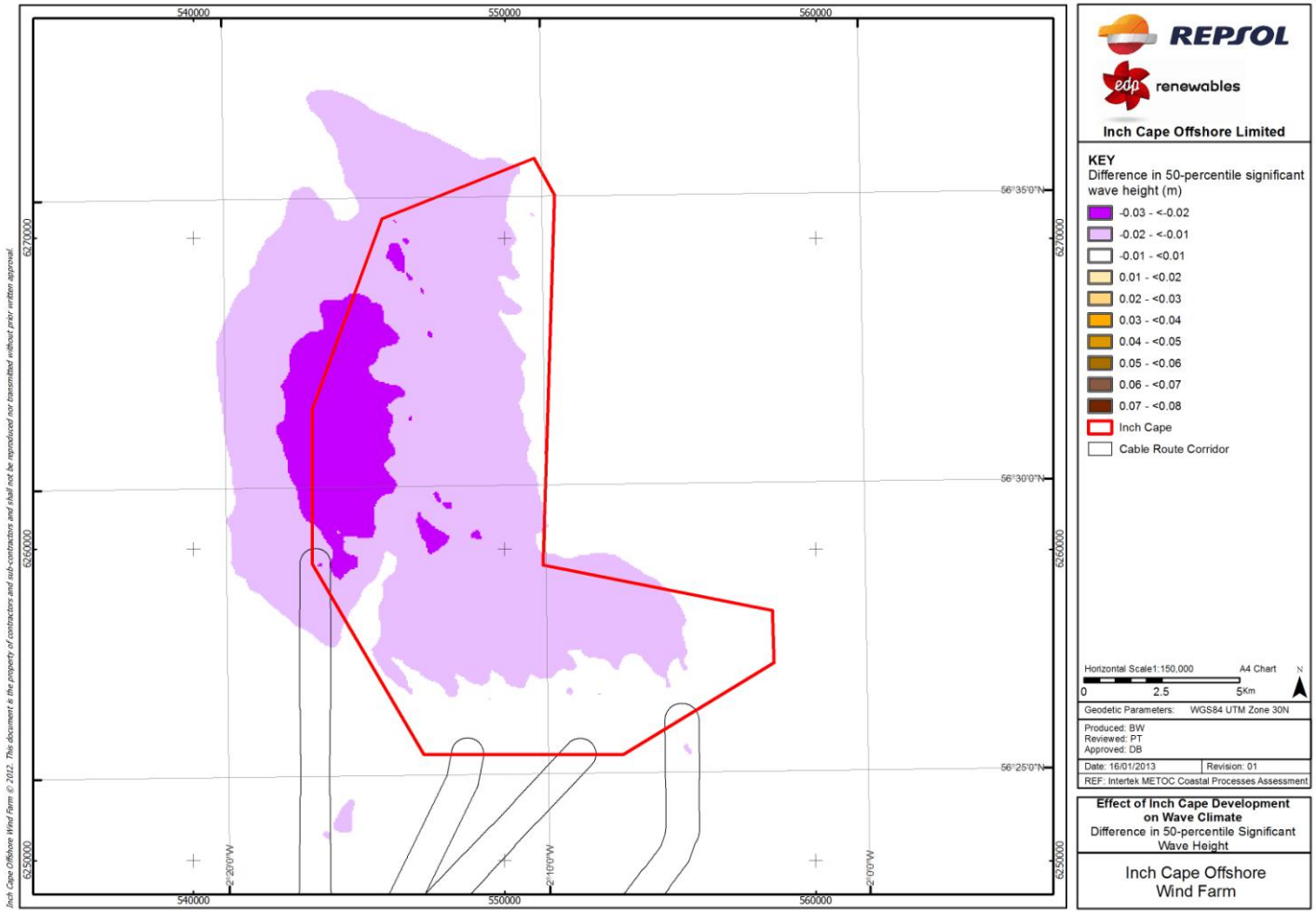


10A.7.24: Difference in 99-percentile current speed (m/s) – far-field

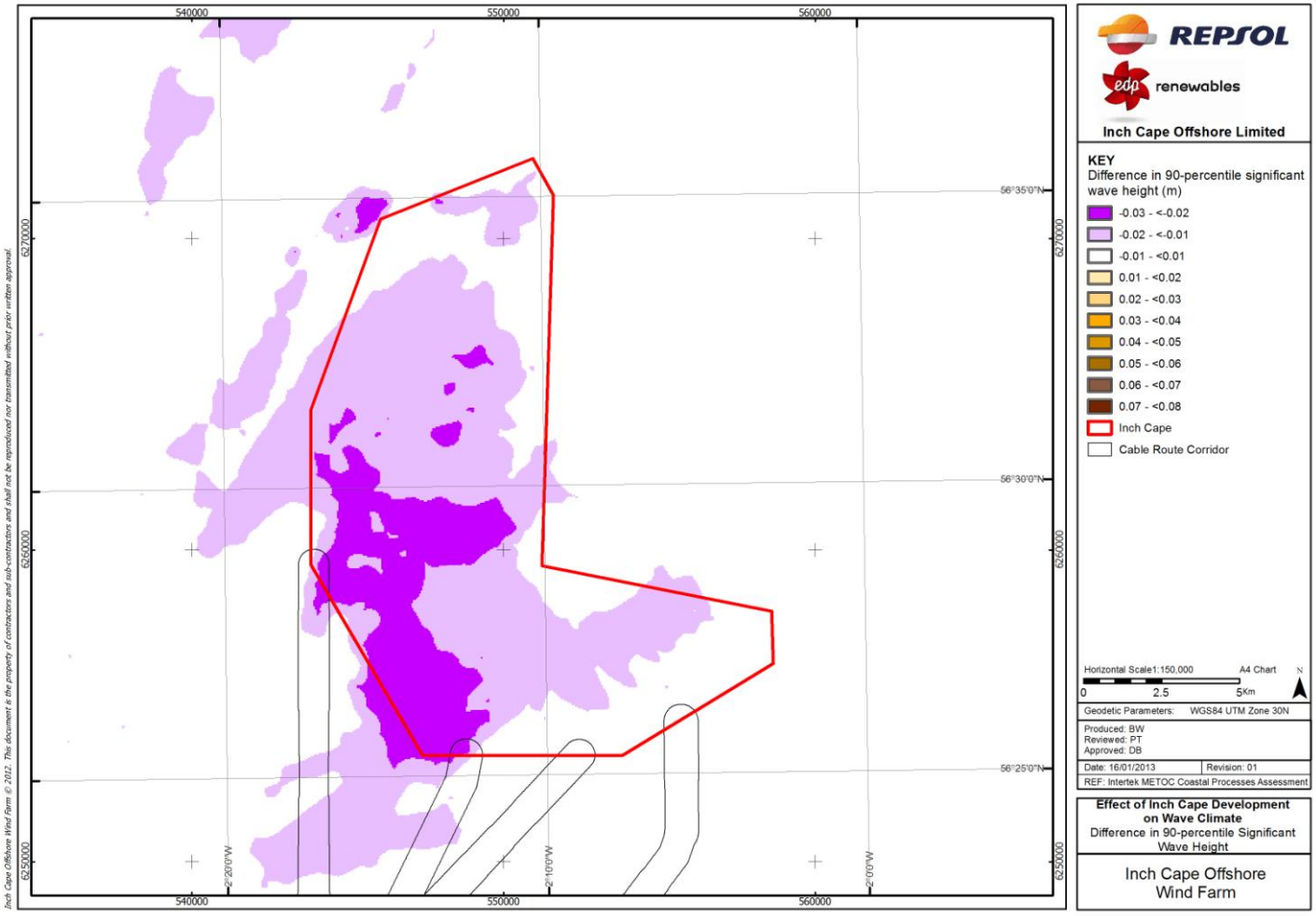


Wave climate

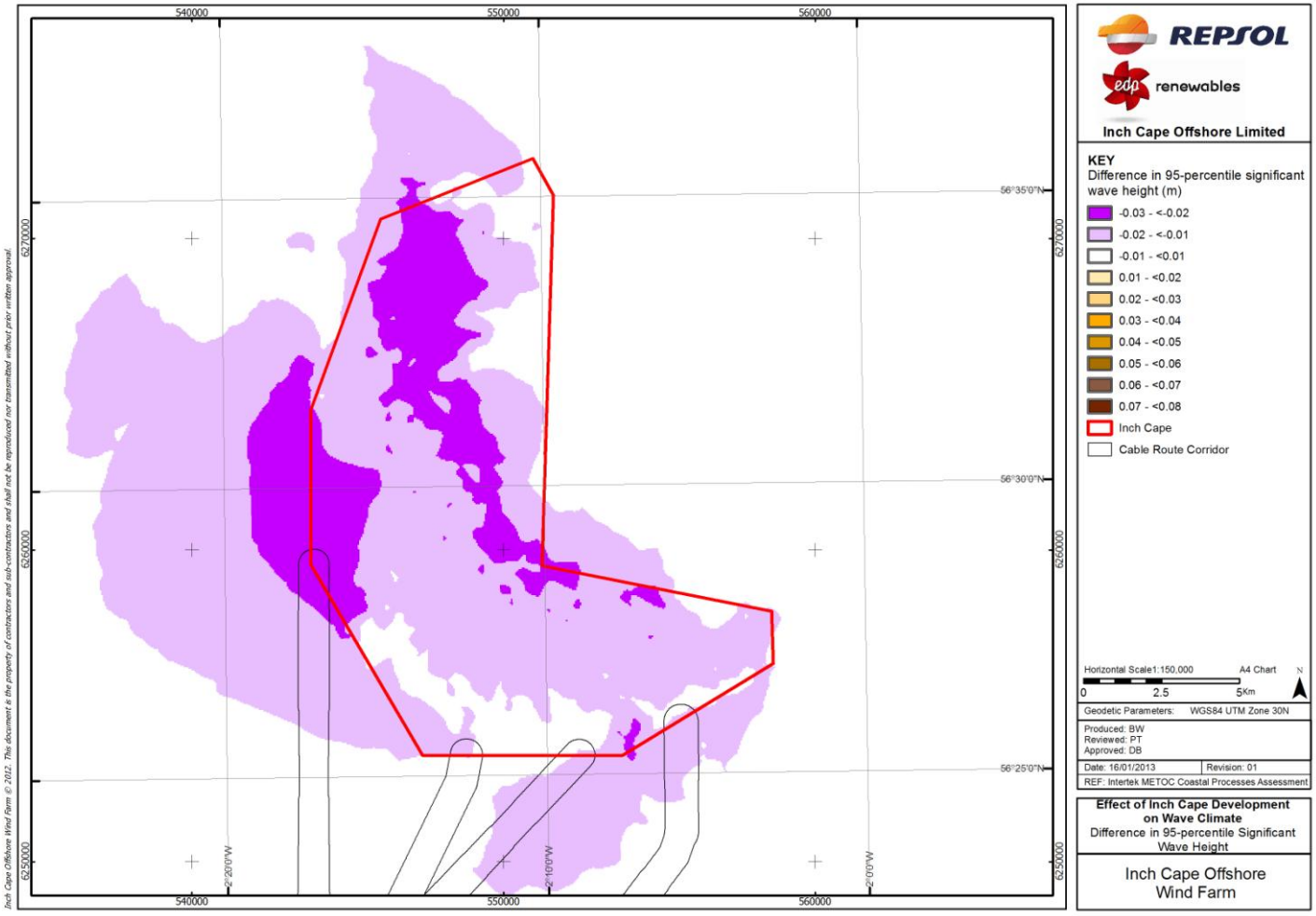
10A.7.25: Difference in 50-percentile significant wave height (m) – near-field



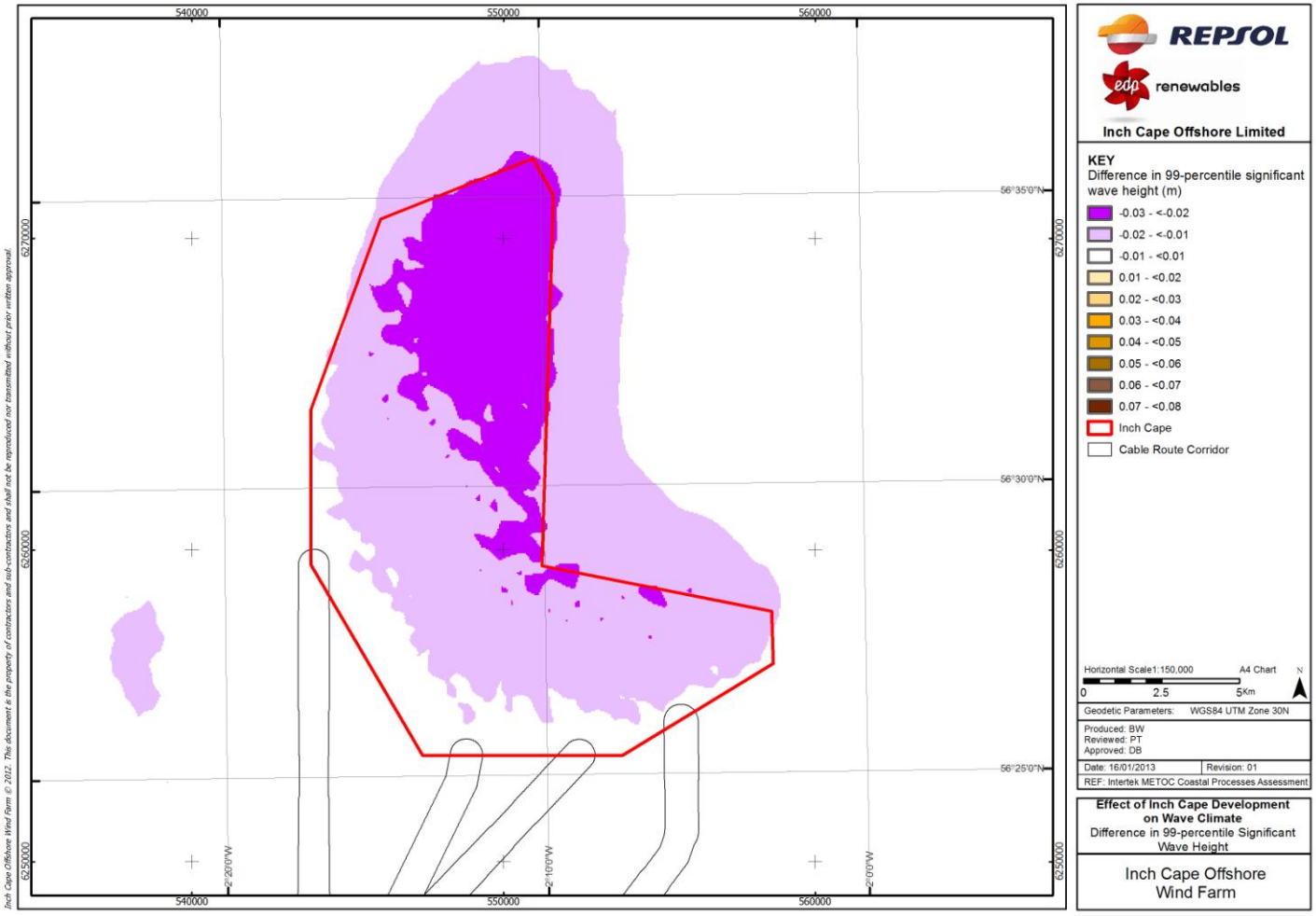
10A.7.26: Difference in 90-percentile significant wave height (m) – near-field



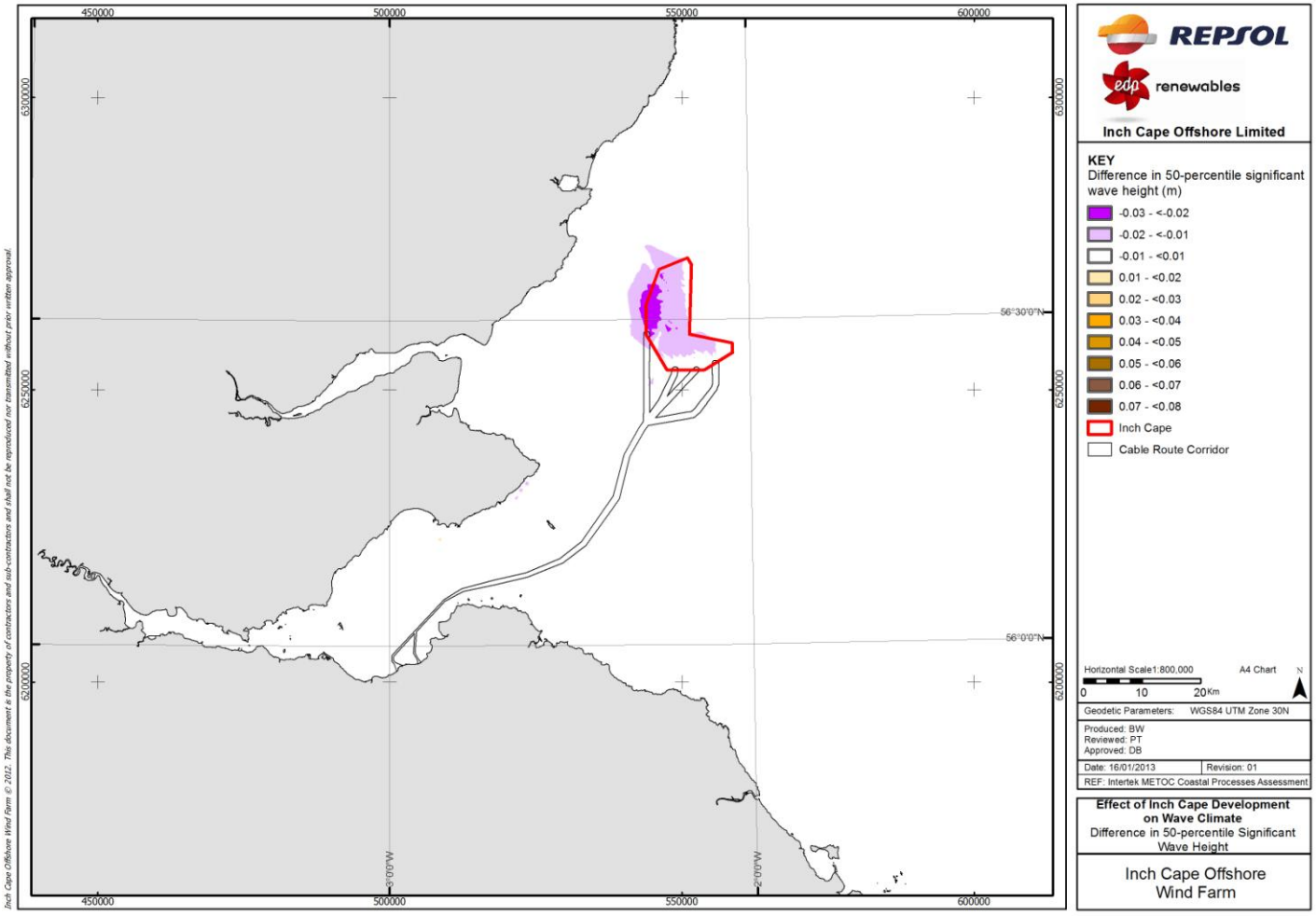
10A.7.27: Difference in 95-percentile significant wave height (m) – near-field



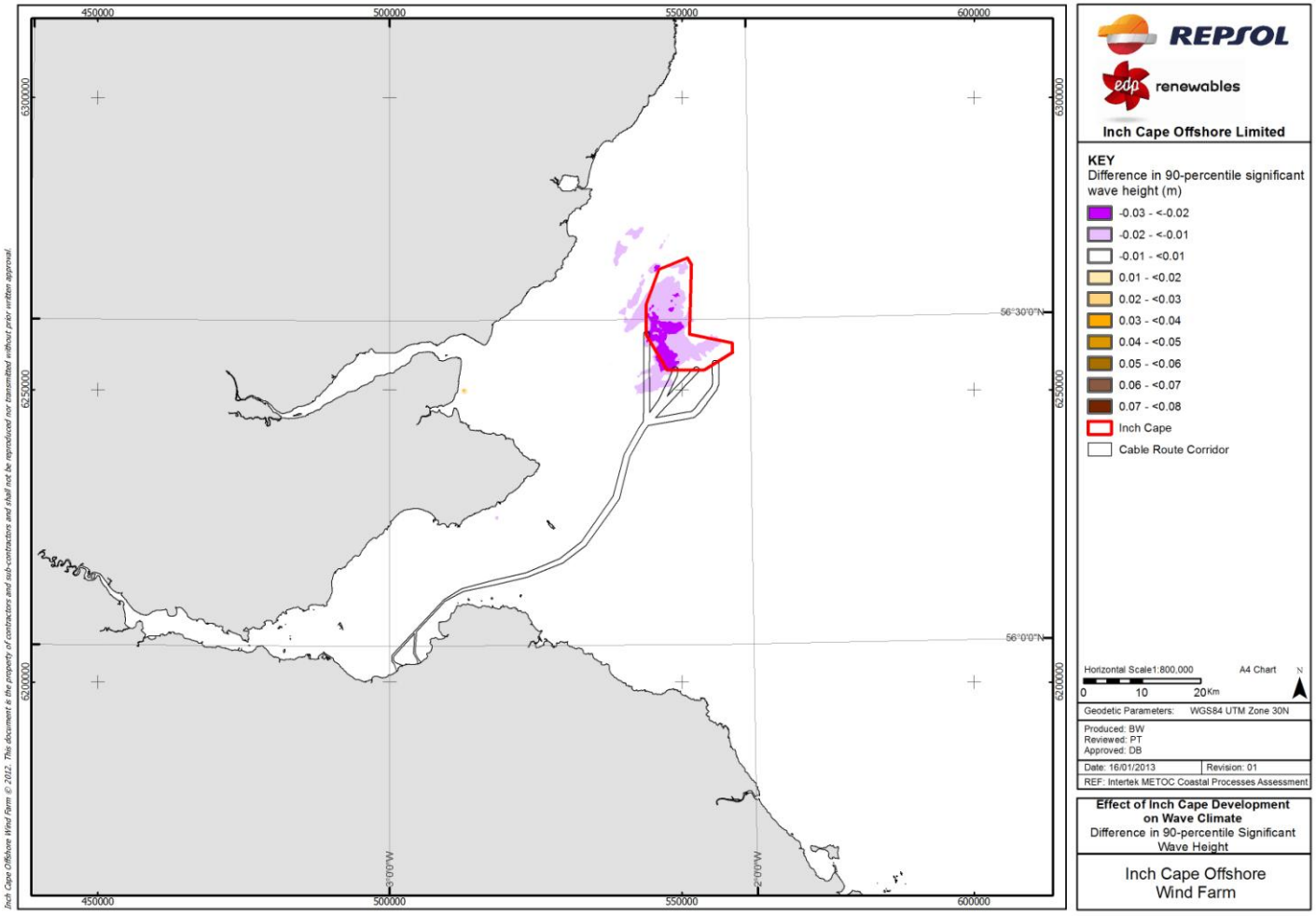
10A.7.28: Difference in 99-percentile significant wave height (m) – near-field



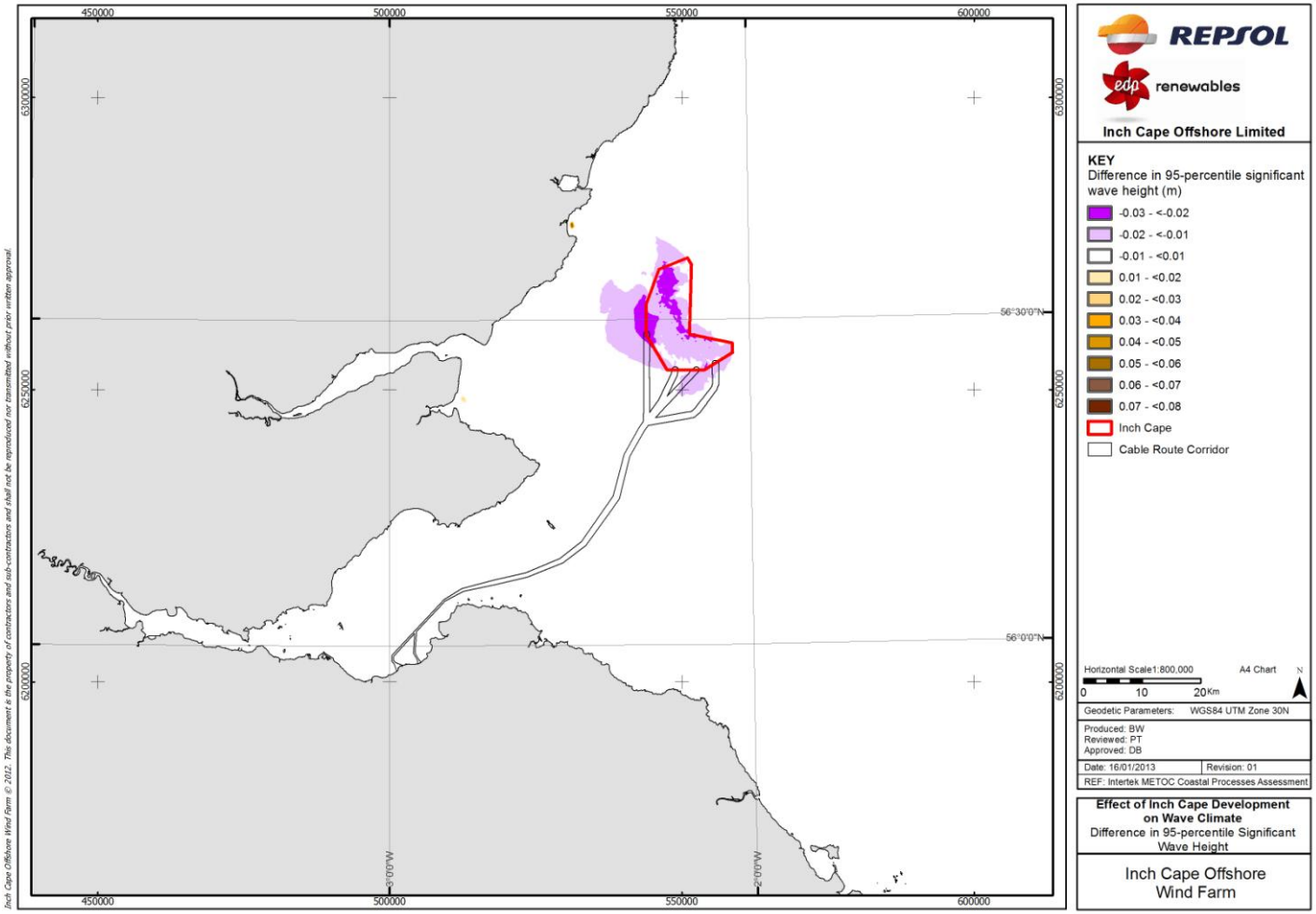
10A.7.29: Difference in 50-percentile significant wave height (m) – far-field



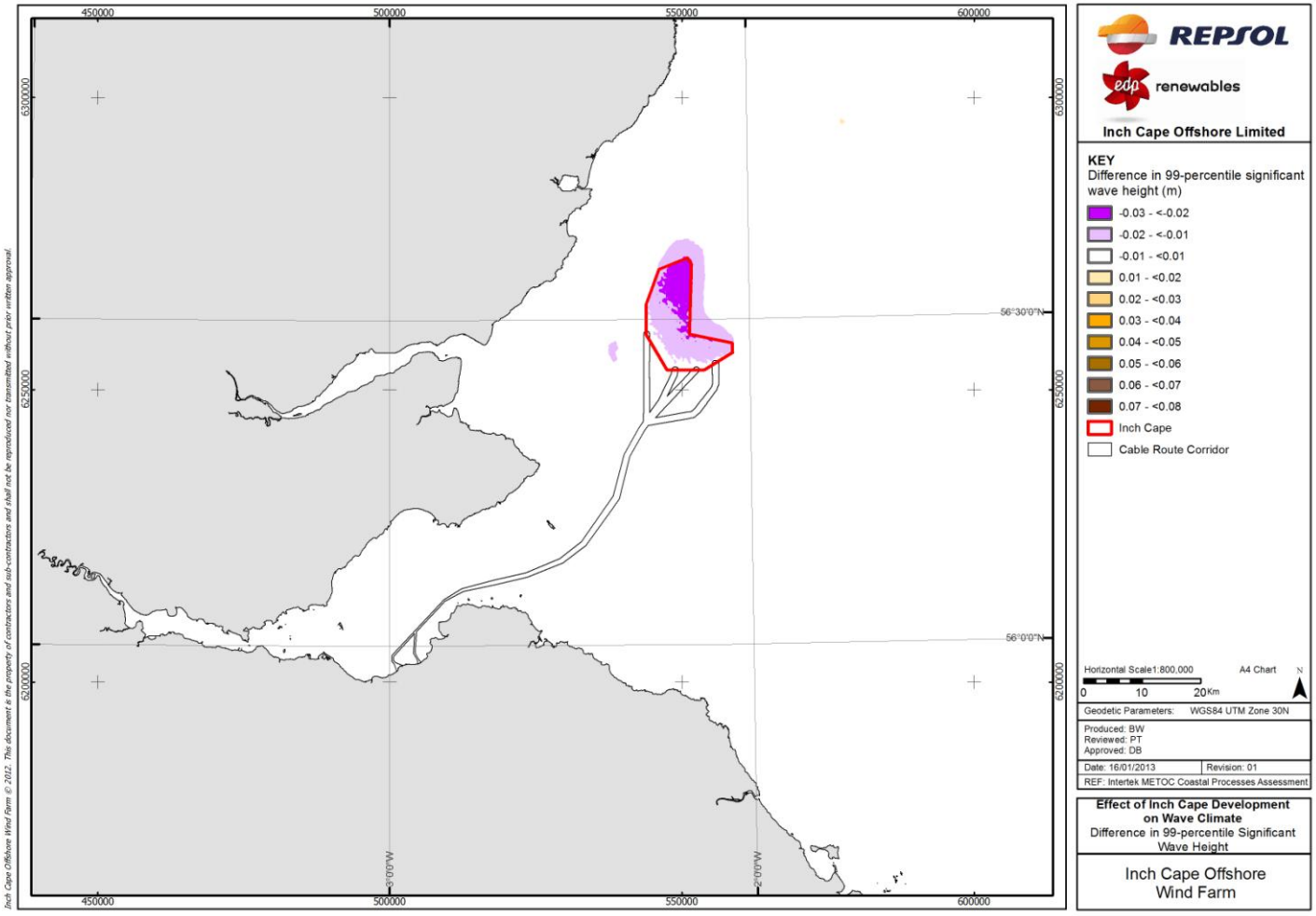
10A.7.30: Difference in 90-percentile significant wave height (m) – far-field



10A.7.31: Difference in 95-percentile significant wave height (m) – far-field

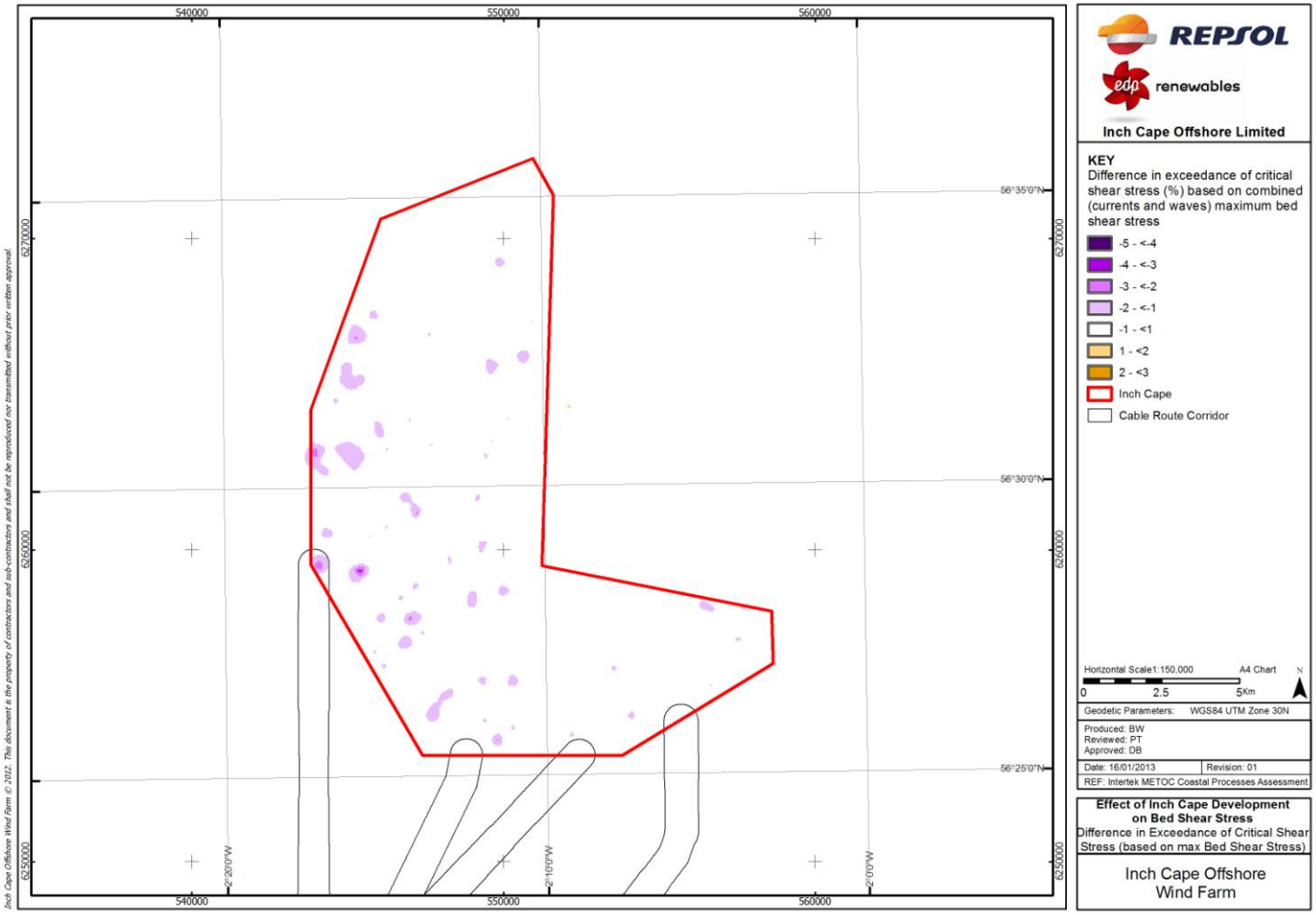


10A.7.32: Difference in 99-percentile significant wave height (m) – far-field

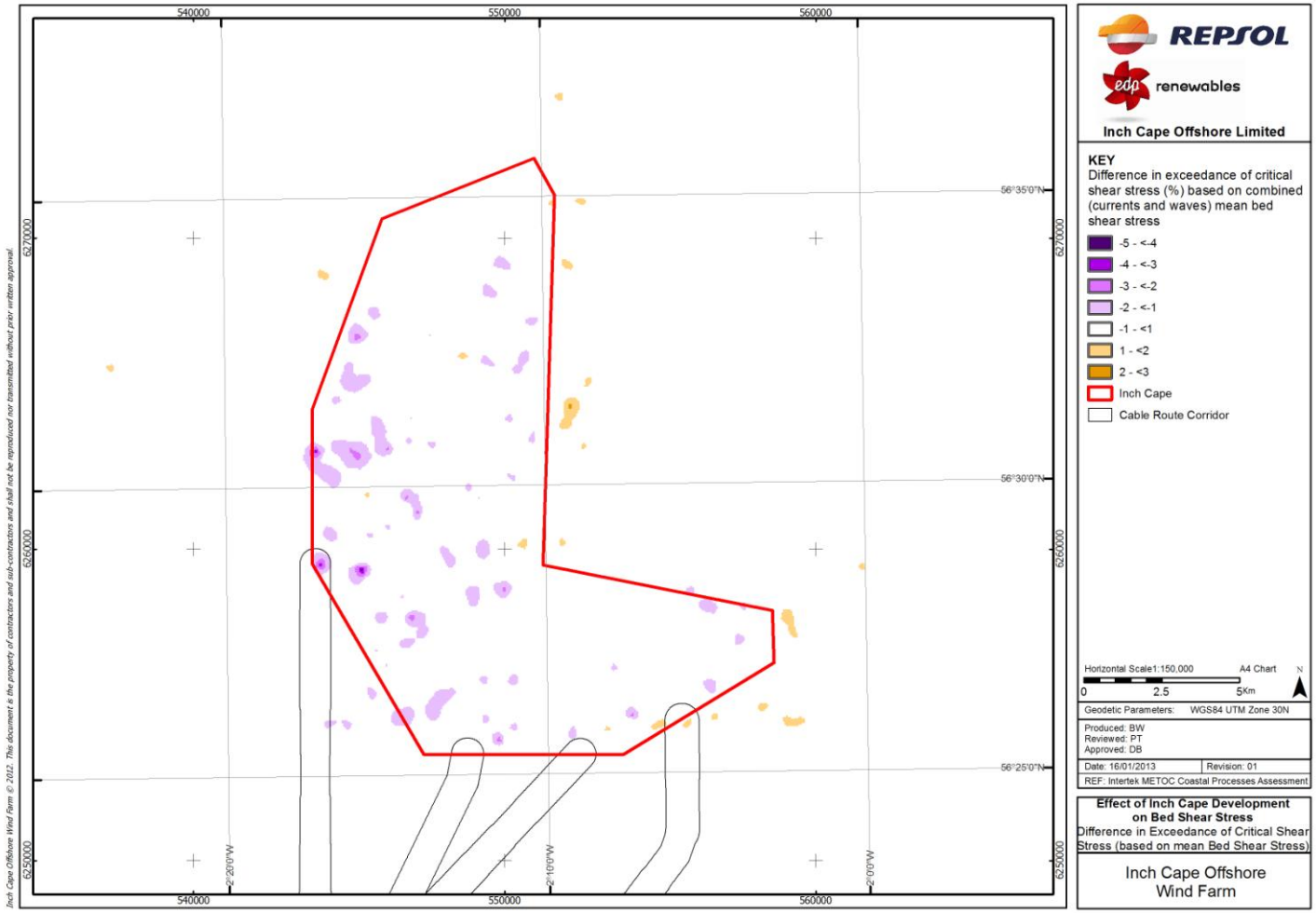


Sediment regime

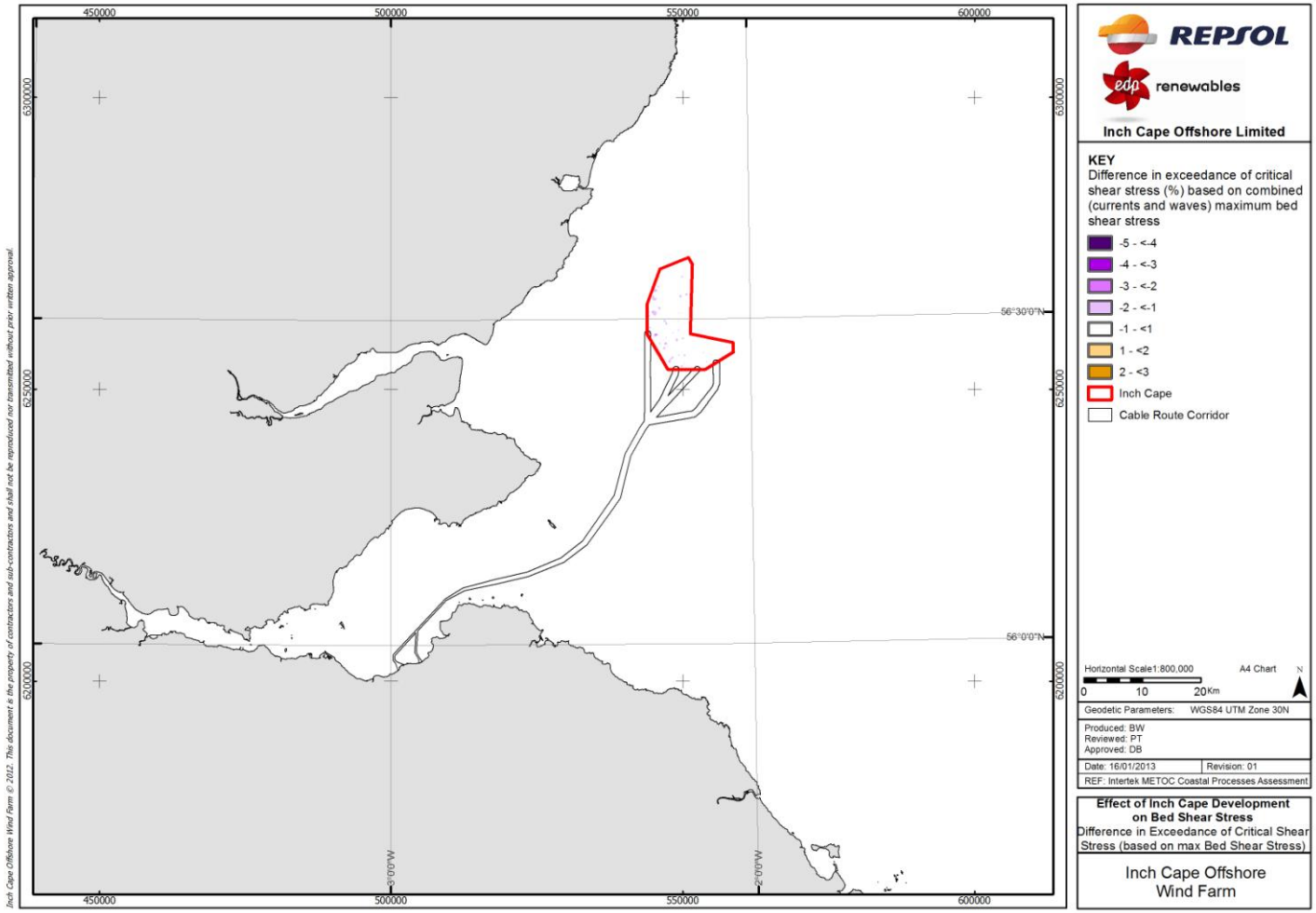
10A.7.33: Difference in the exceedance of critical shear stress (N/m2) – based on the combined (currents plus waves) maximum bed shear stress – near-field



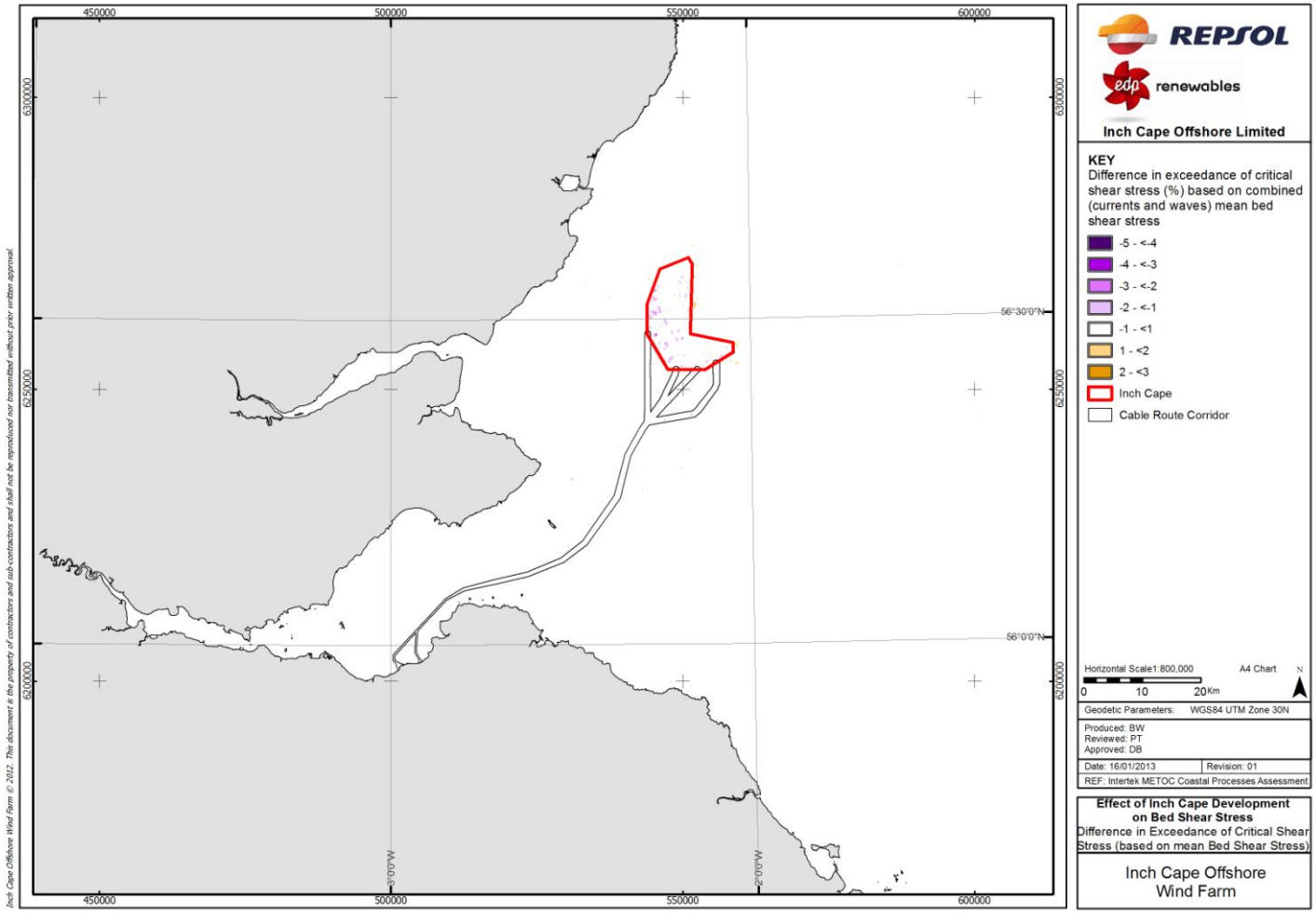
10A.7.34: Difference in the exceedance of critical shear stress (N/m2) – based on the combined (currents plus waves) mean bed shear stress – near-field



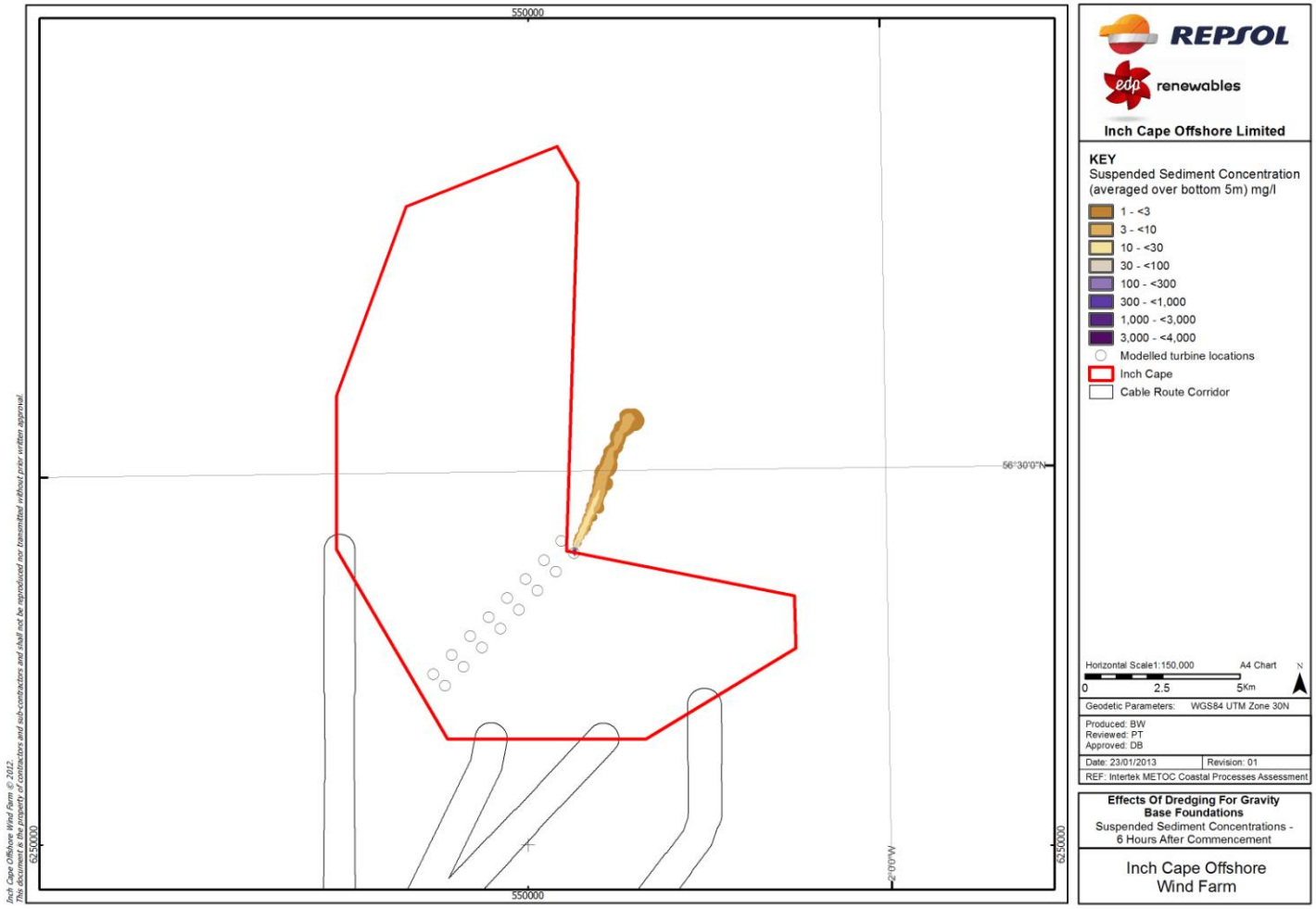
10A.7.35: Difference in the exceedance of critical shear stress (N/m2) – based on the combined (currents plus waves) maximum bed shear stress – far-field



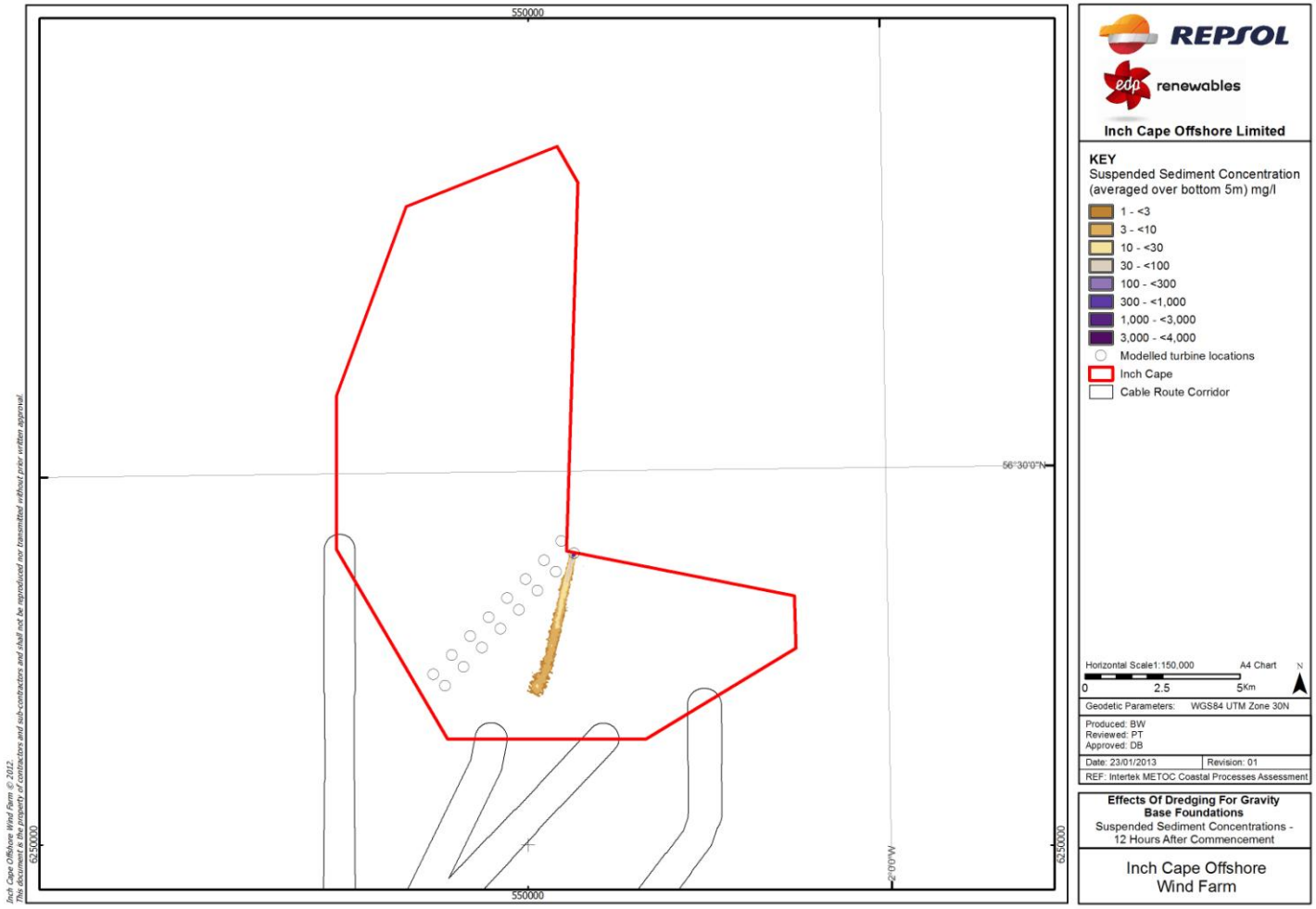
10A.7.36: Difference in the exceedance of critical shear stress (N/m2) – based on the combined (currents plus waves) mean bed shear stress – far-field



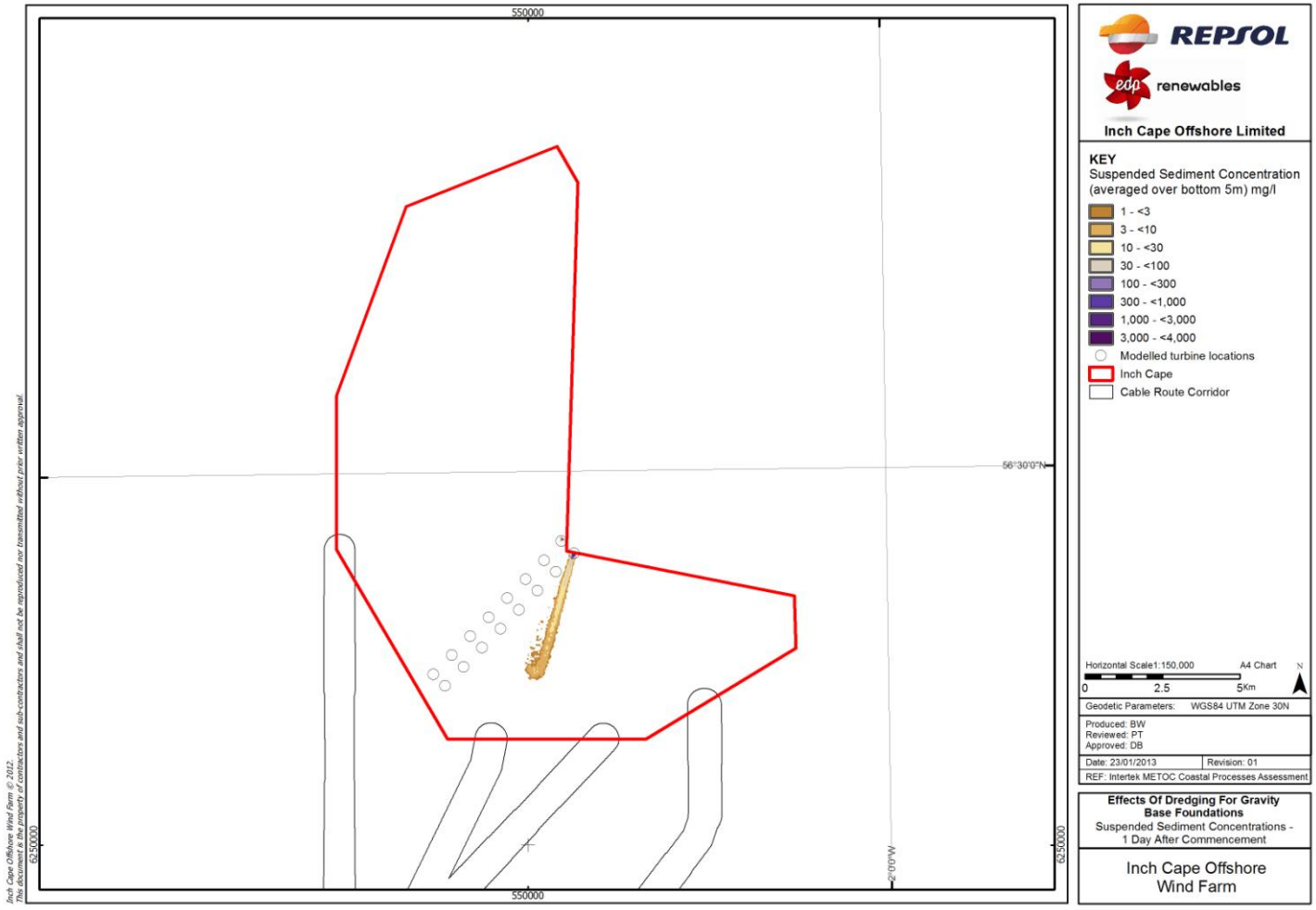
10A.7.37: Suspended sediment concentrations due to dredging: 6 hours after commencement



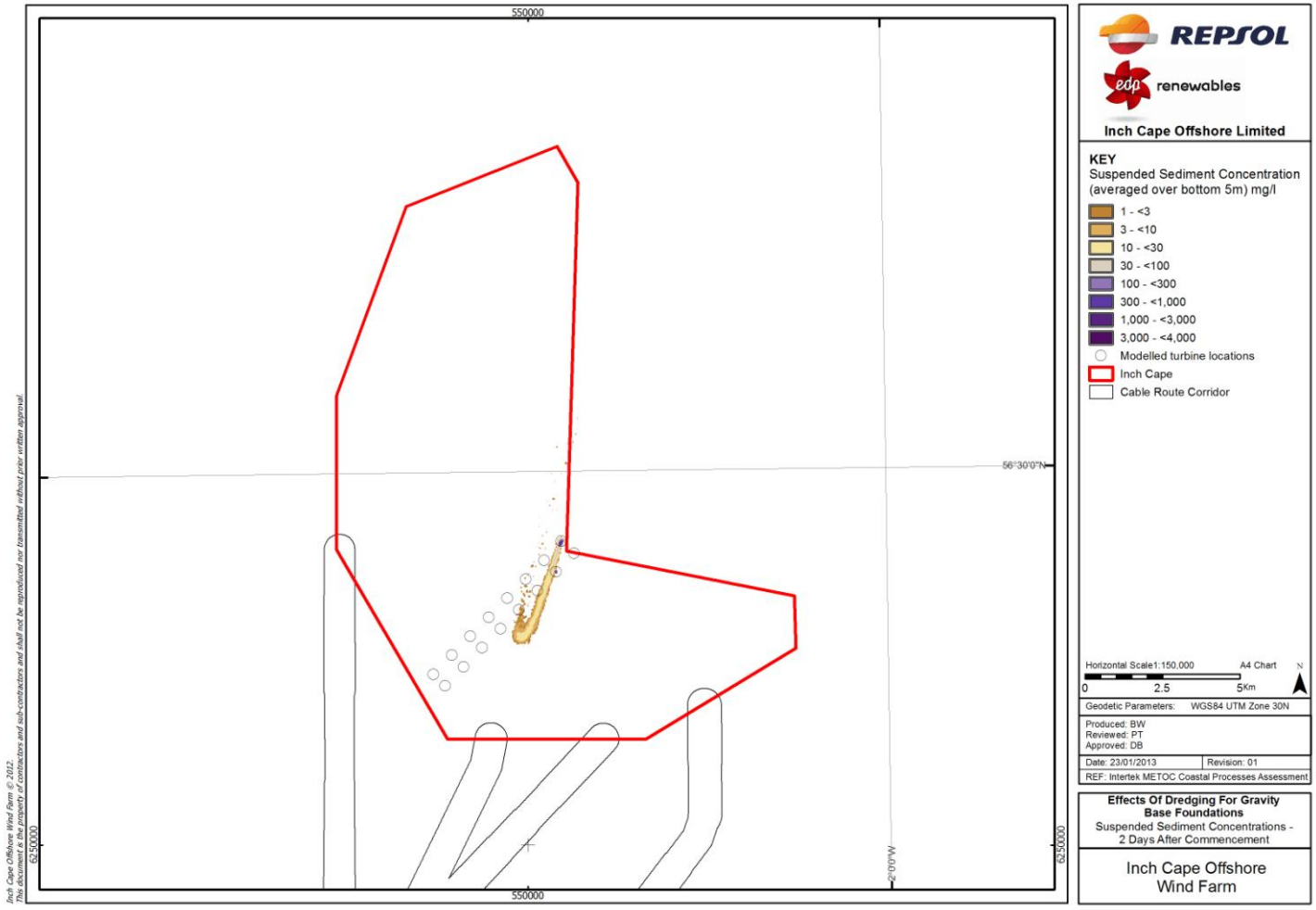
10A.7.38: Suspended sediment concentrations due to dredging: 12 hours after commencement



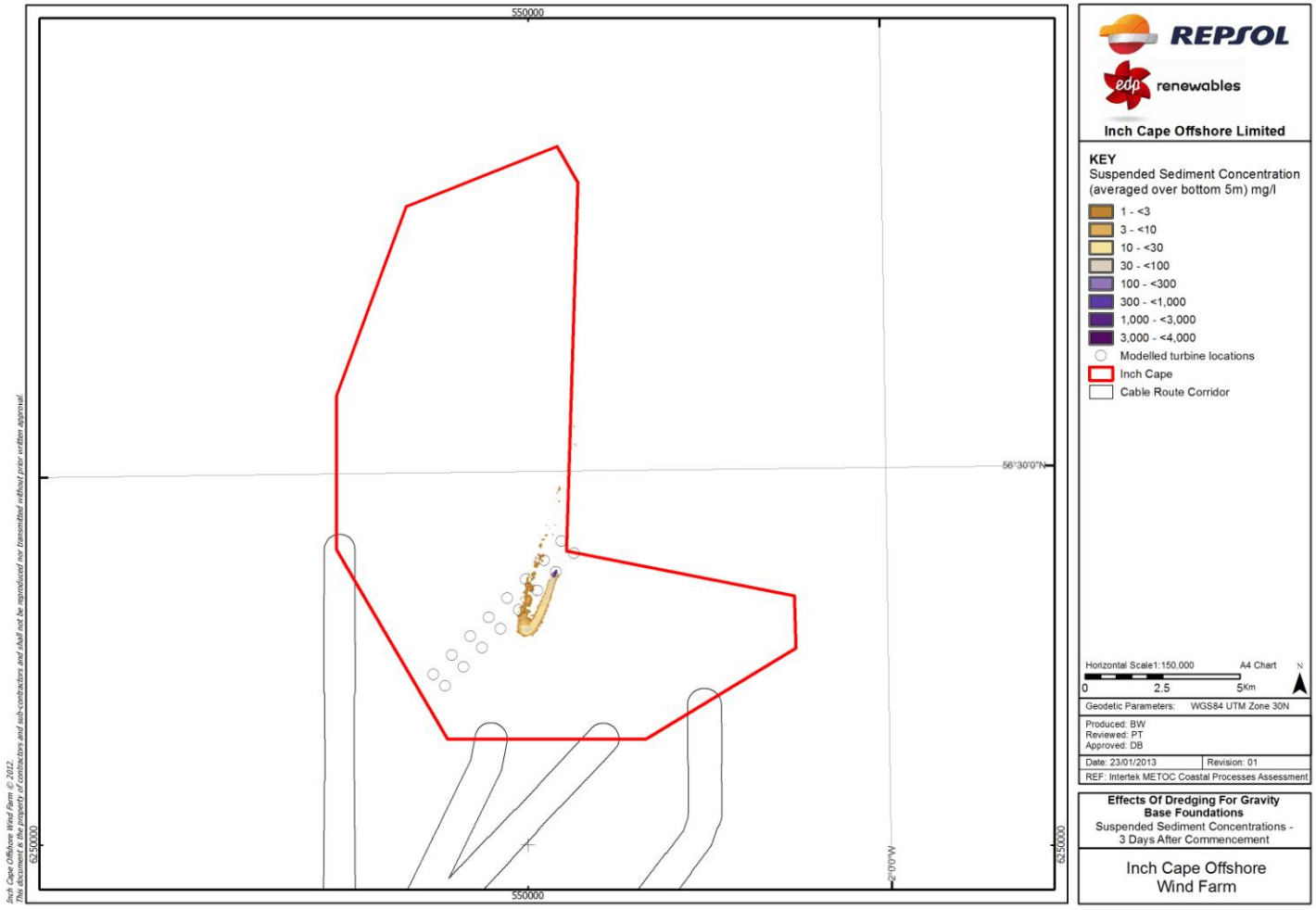
10A.7.39: Suspended sediment concentrations due to dredging: 1 day after commencement



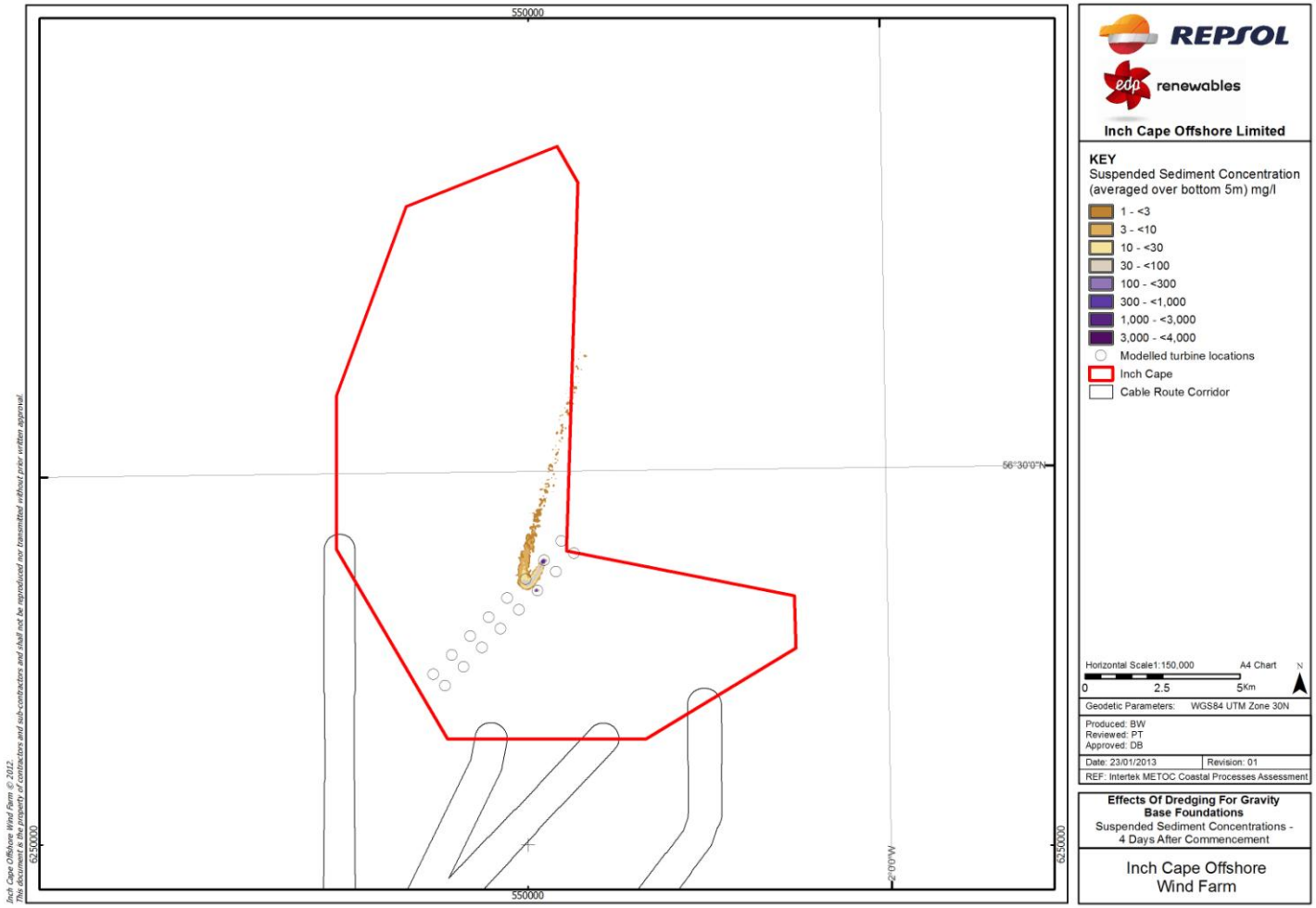
10A.7.40: Suspended sediment concentrations due to dredging: 2 days after commencement



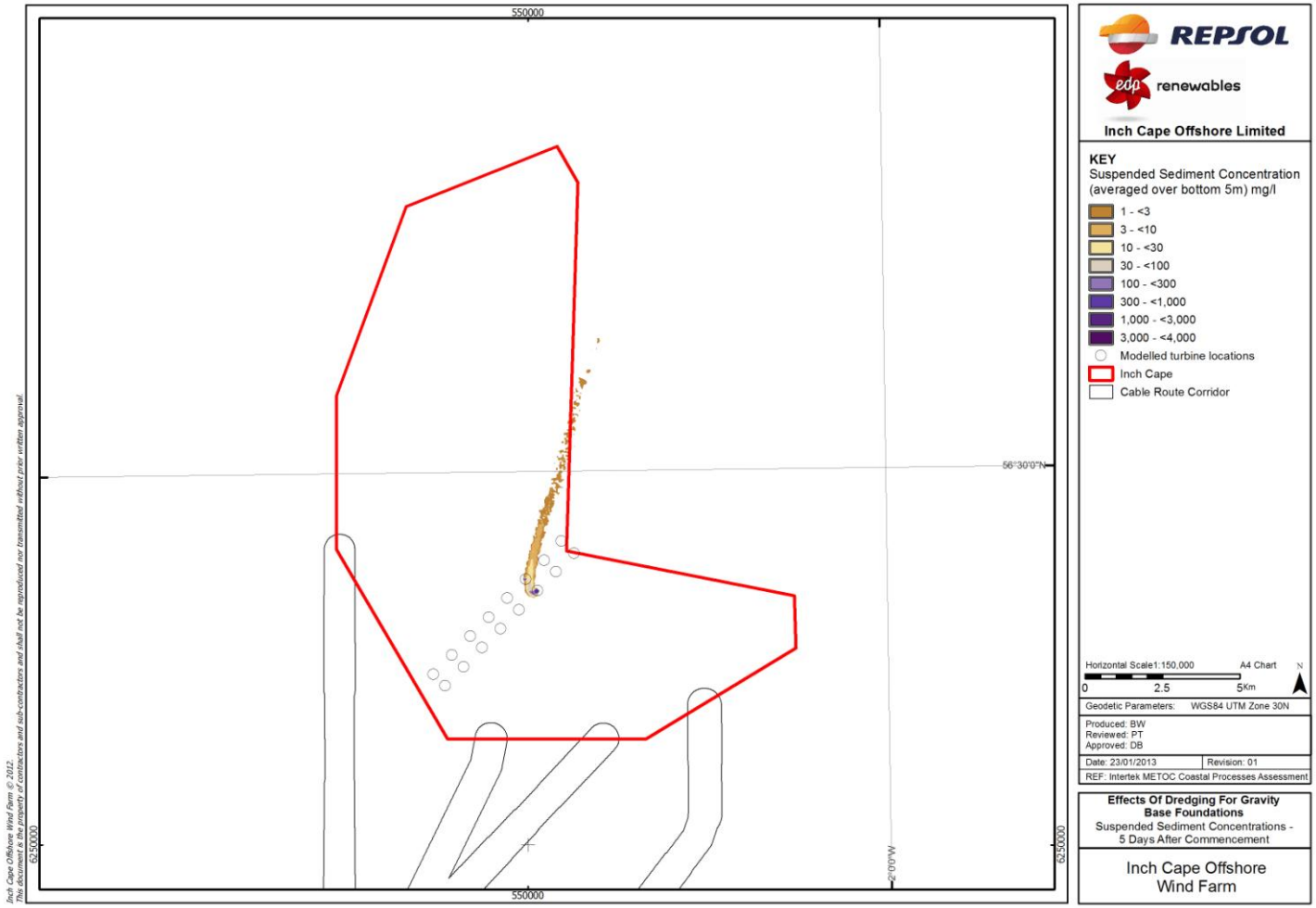
10A.7.41: Suspended sediment concentrations due to dredging: 3 days after commencement



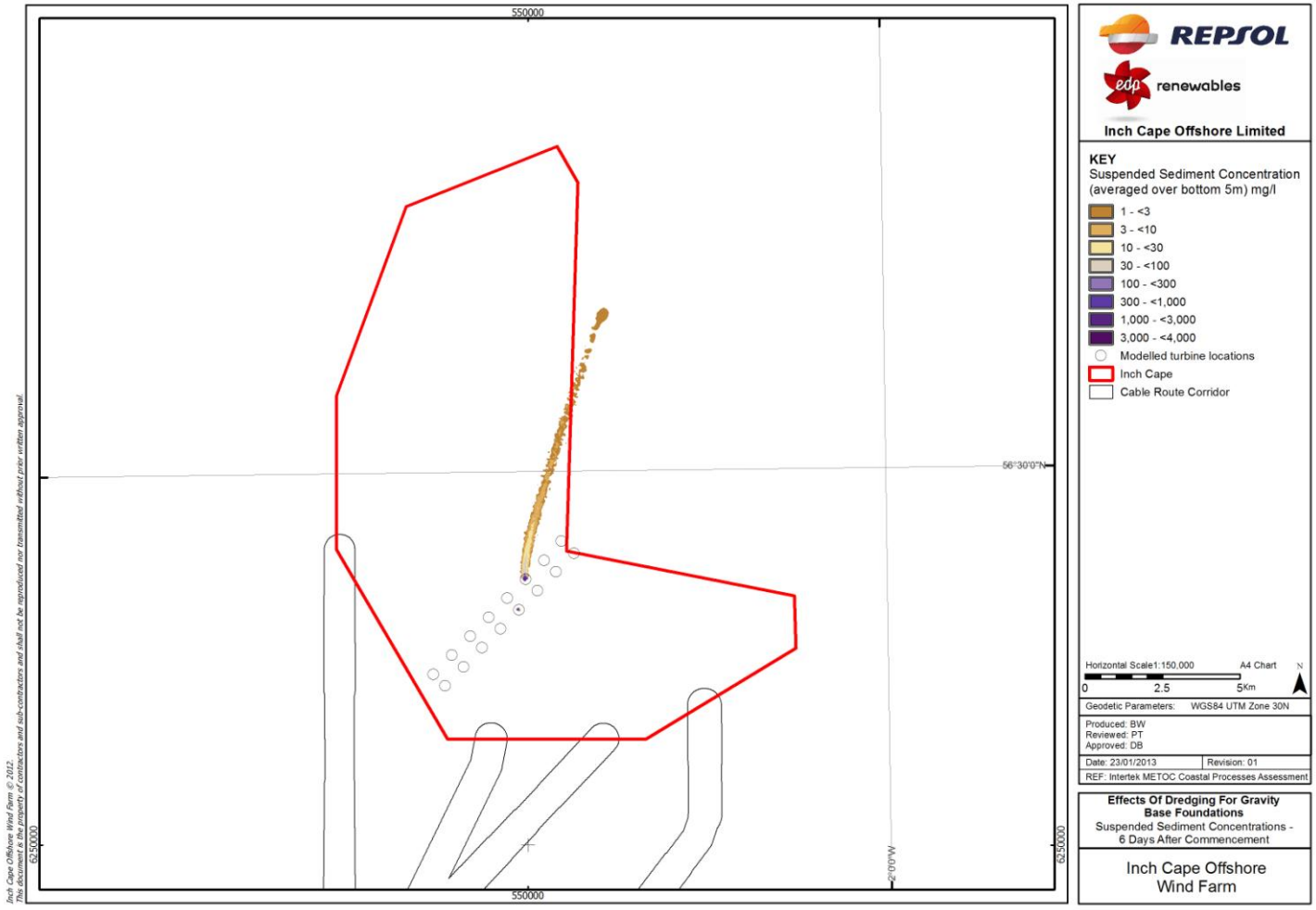
10A.7.42: Suspended sediment concentrations due to dredging: 4 days after commencement



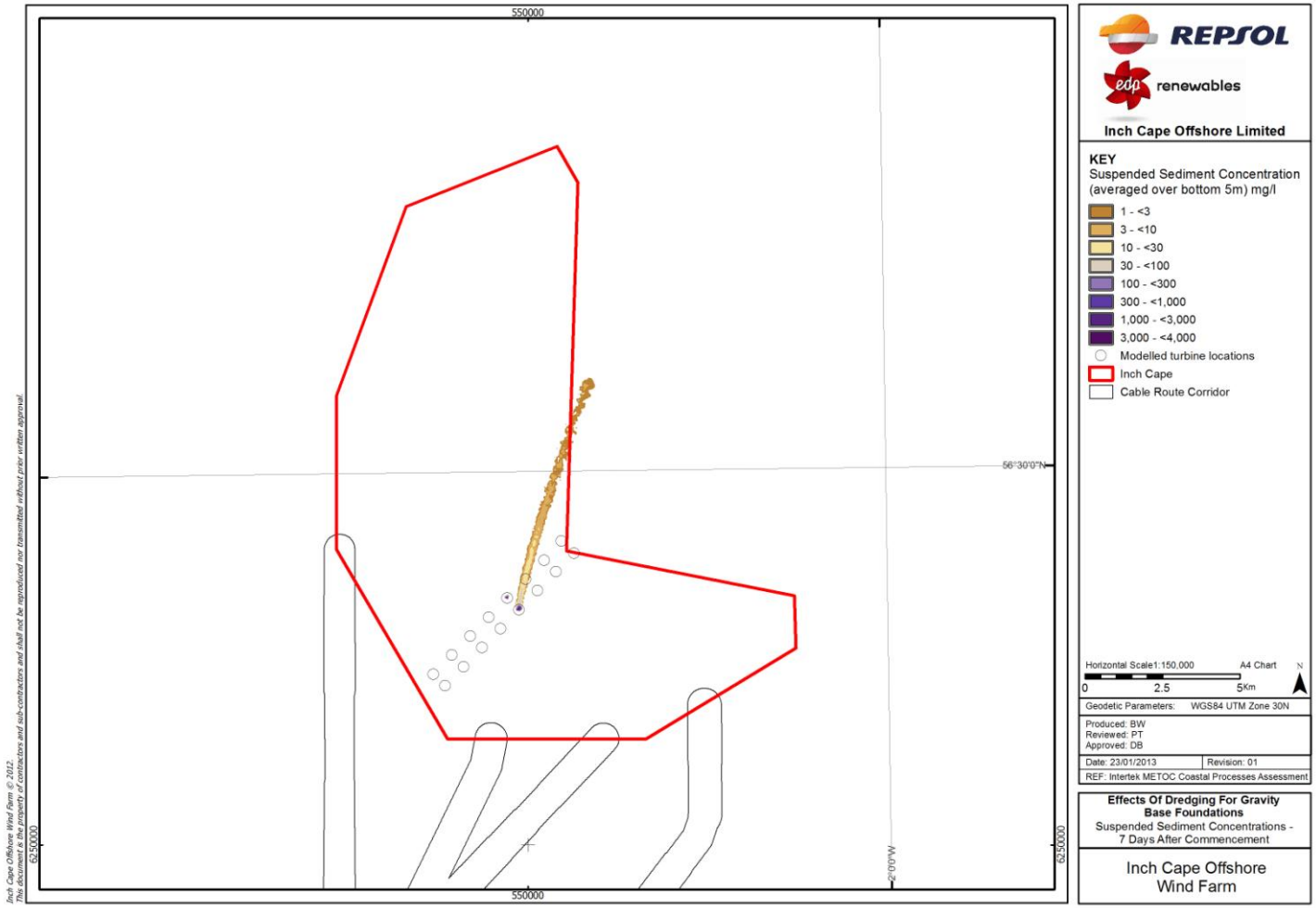
10A.7.43: Suspended sediment concentrations due to dredging: 5 days after commencement



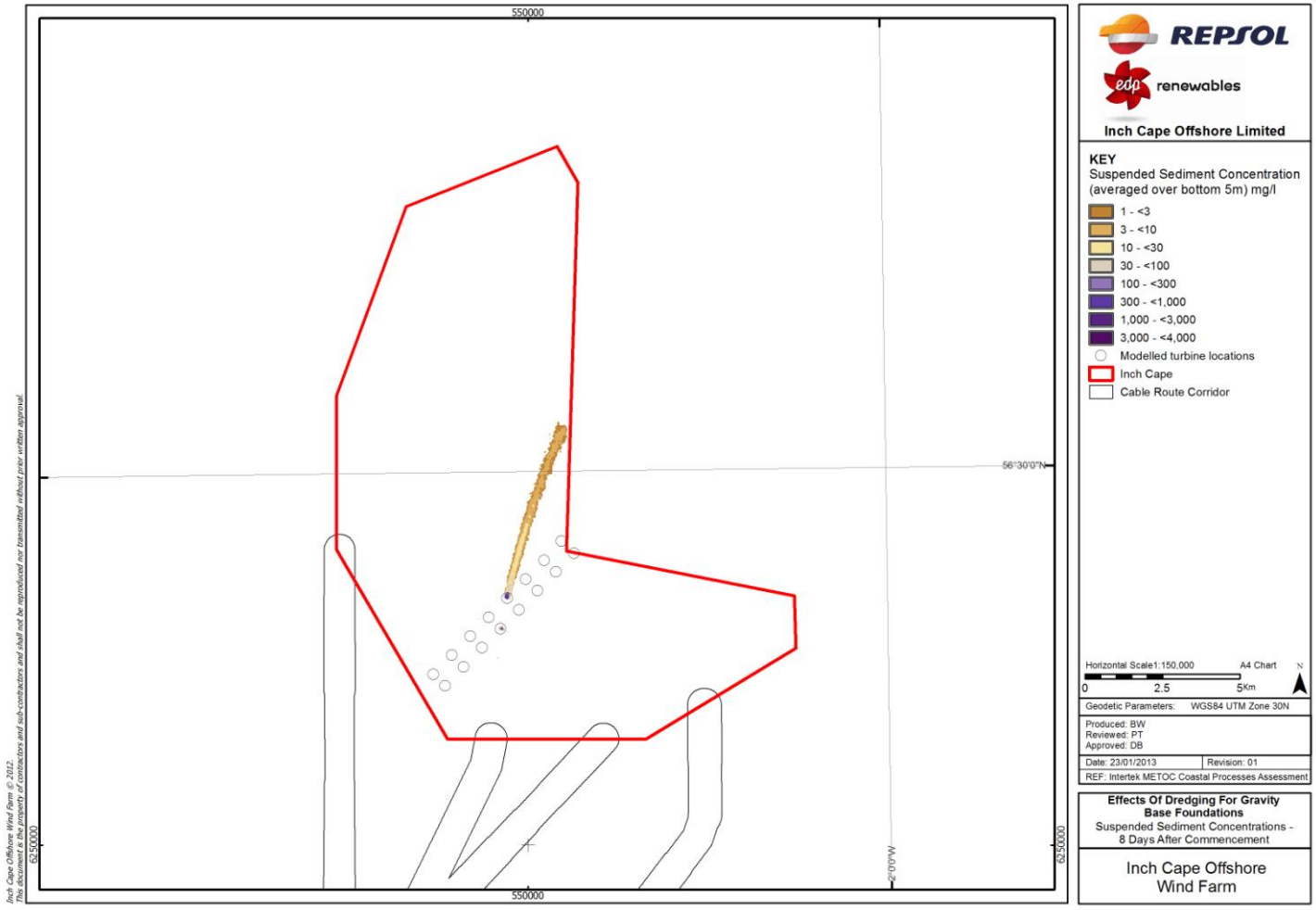
10A.7.44: Suspended sediment concentrations due to dredging: 6 days after commencement



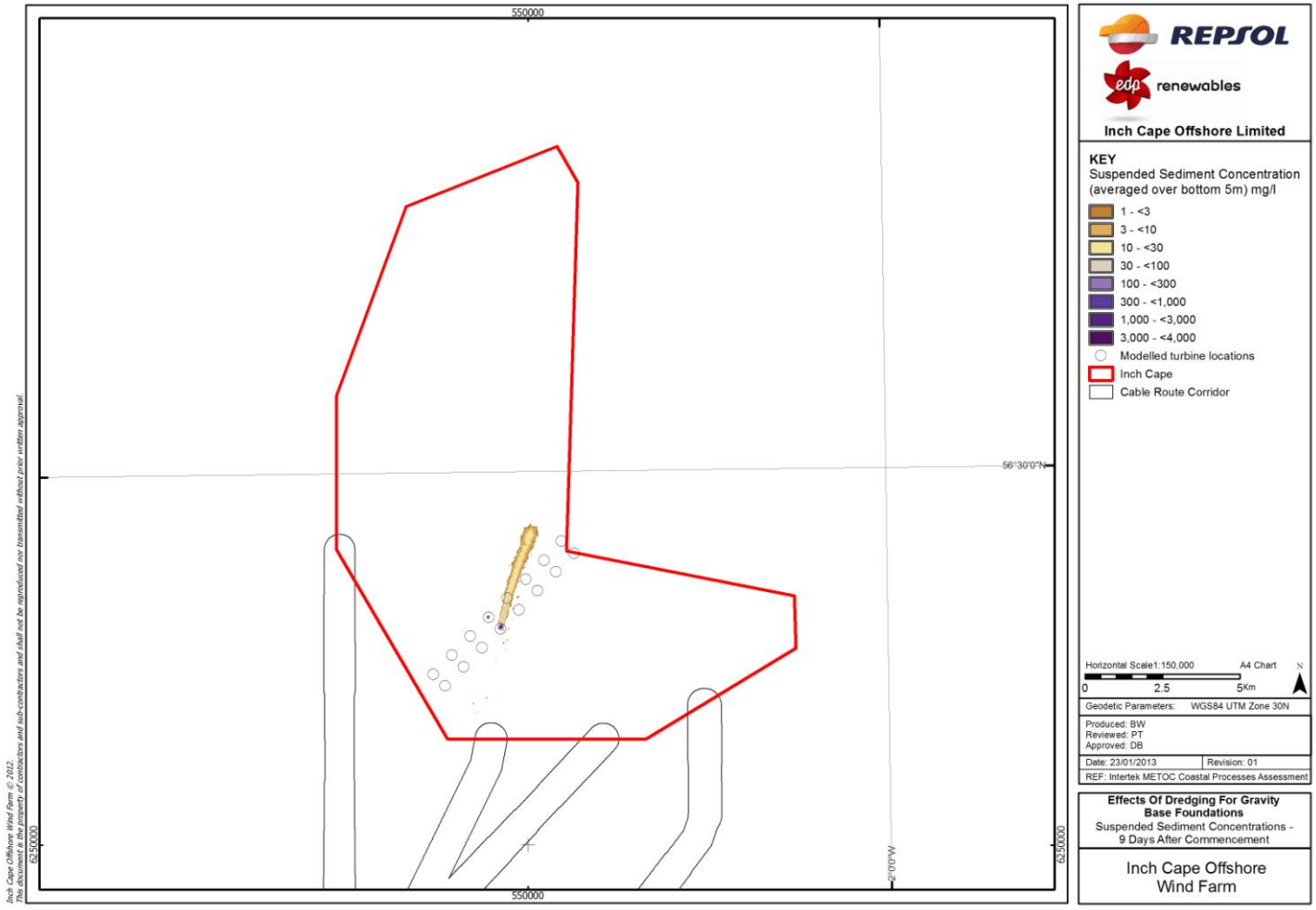
10A.7.45: Suspended sediment concentrations due to dredging: 7 days after commencement



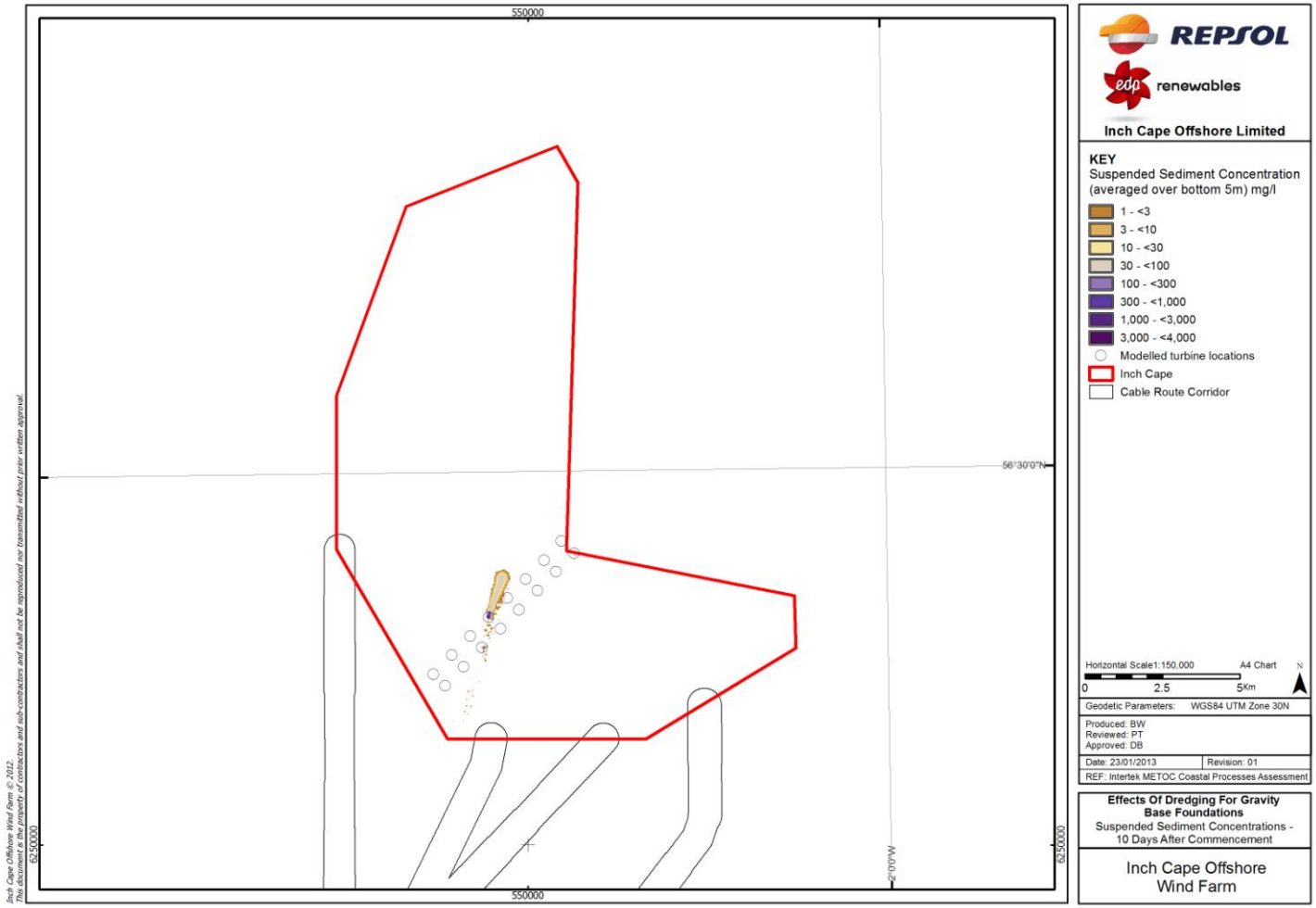
10A.7.46: Suspended sediment concentrations due to dredging: 8 days after commencement



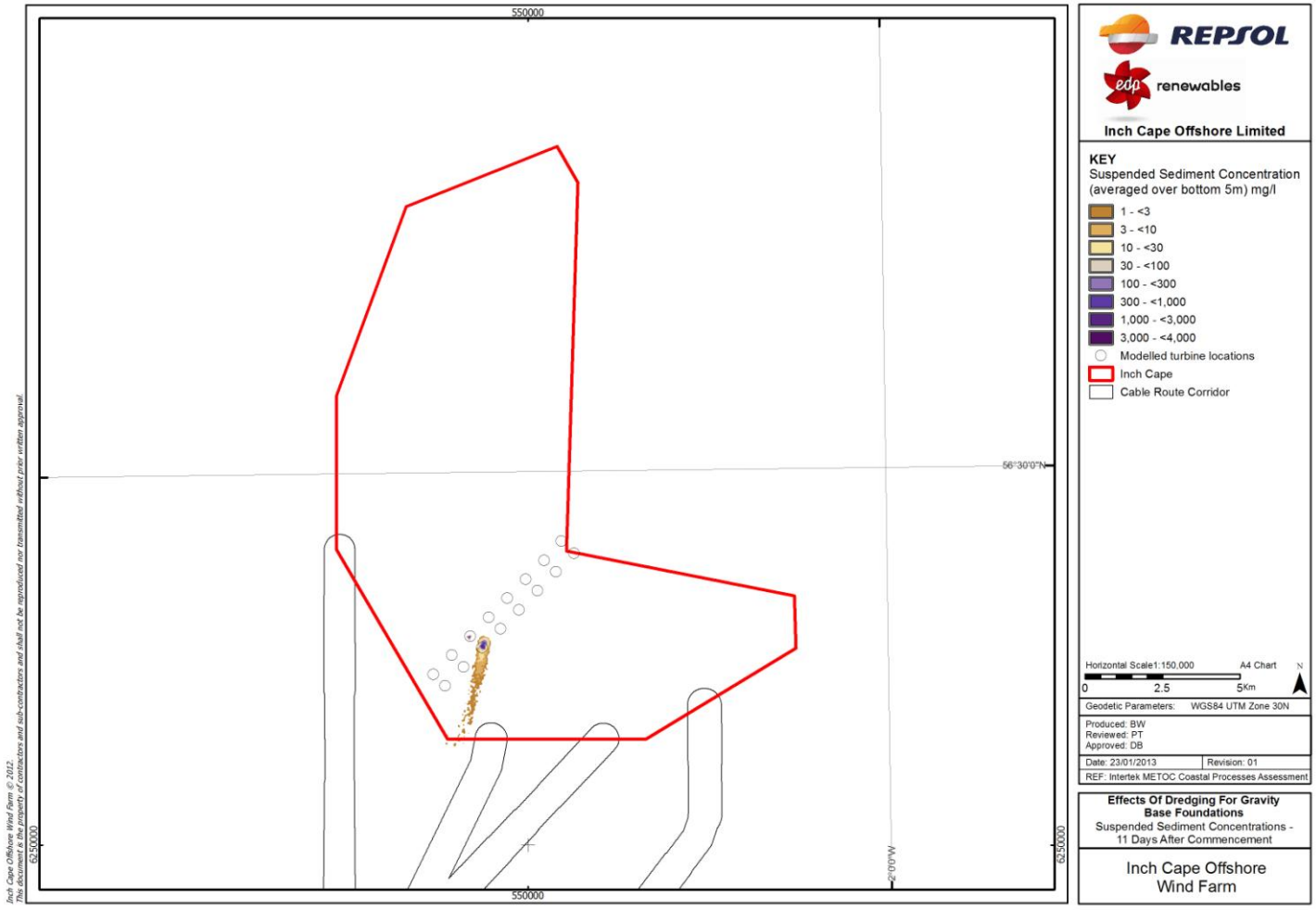
10A.7.47: Suspended sediment concentrations due to dredging: 9 days after commencement



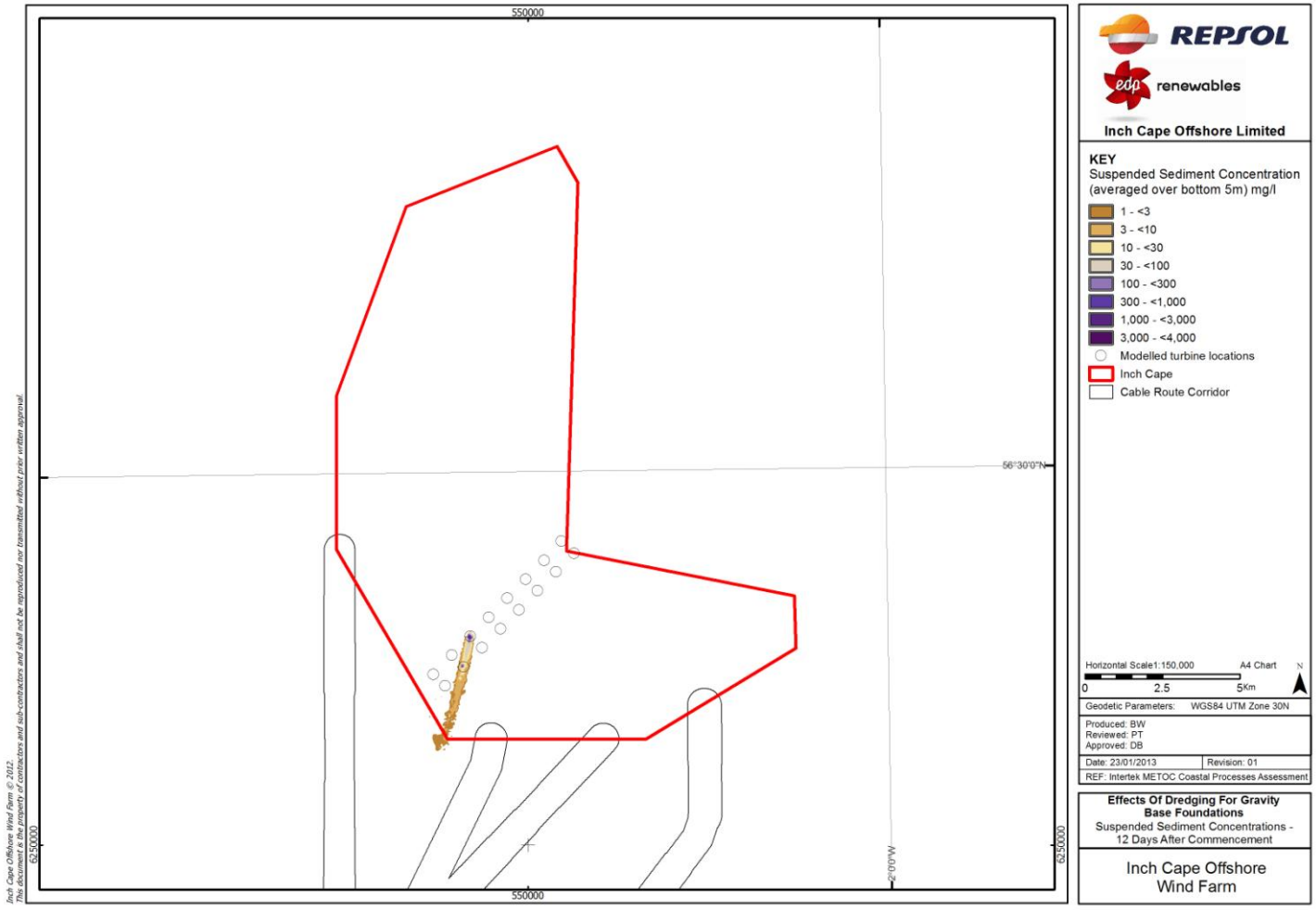
10A.7.48: Suspended sediment concentrations due to dredging: 10 days after commencement



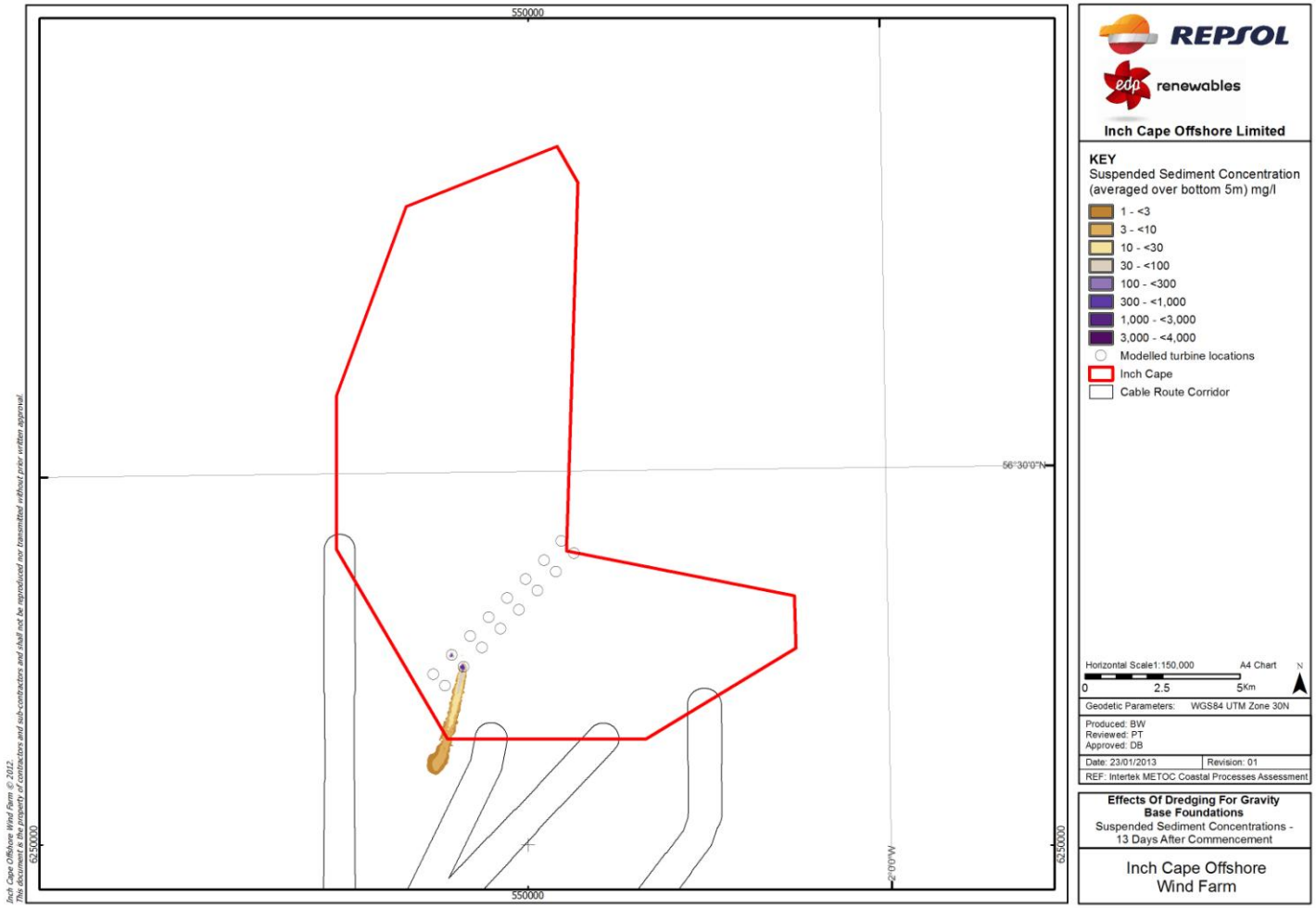
10A.7.49: Suspended sediment concentrations due to dredging: 11 days after commencement



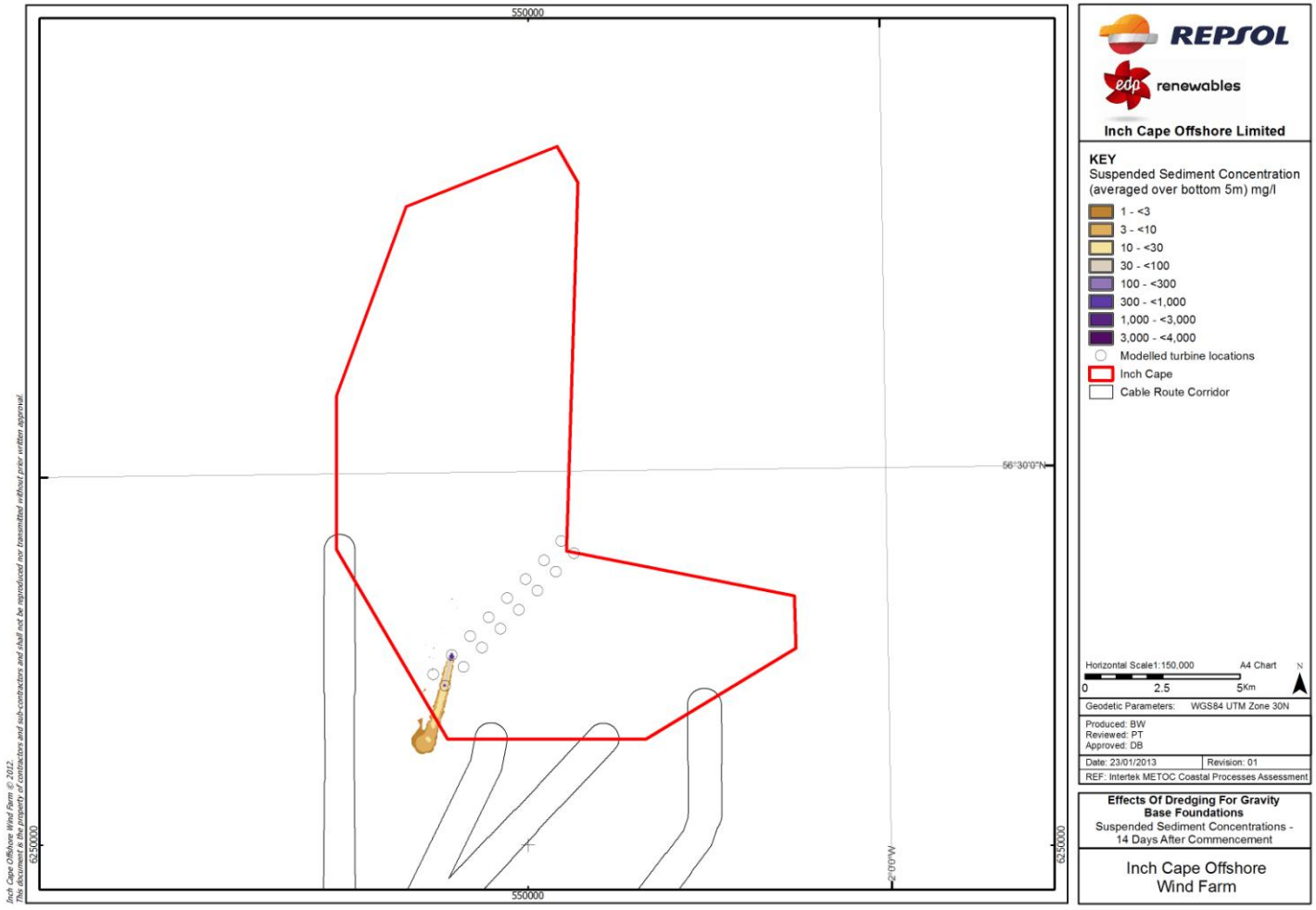
10A.7.50: Suspended sediment concentrations due to dredging: 12 days after commencement



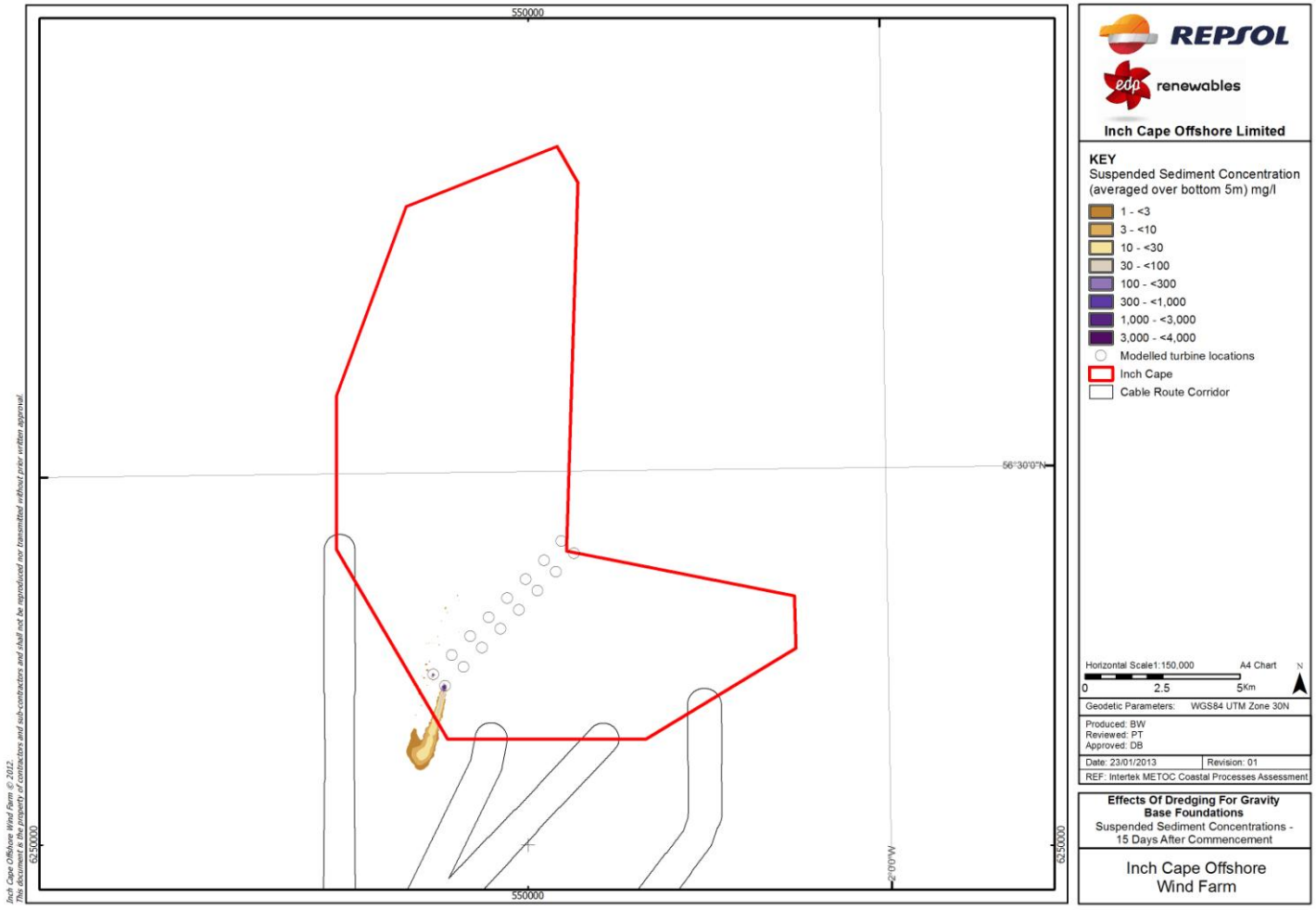
10A.7.51: Suspended sediment concentrations due to dredging: 13 days after commencement



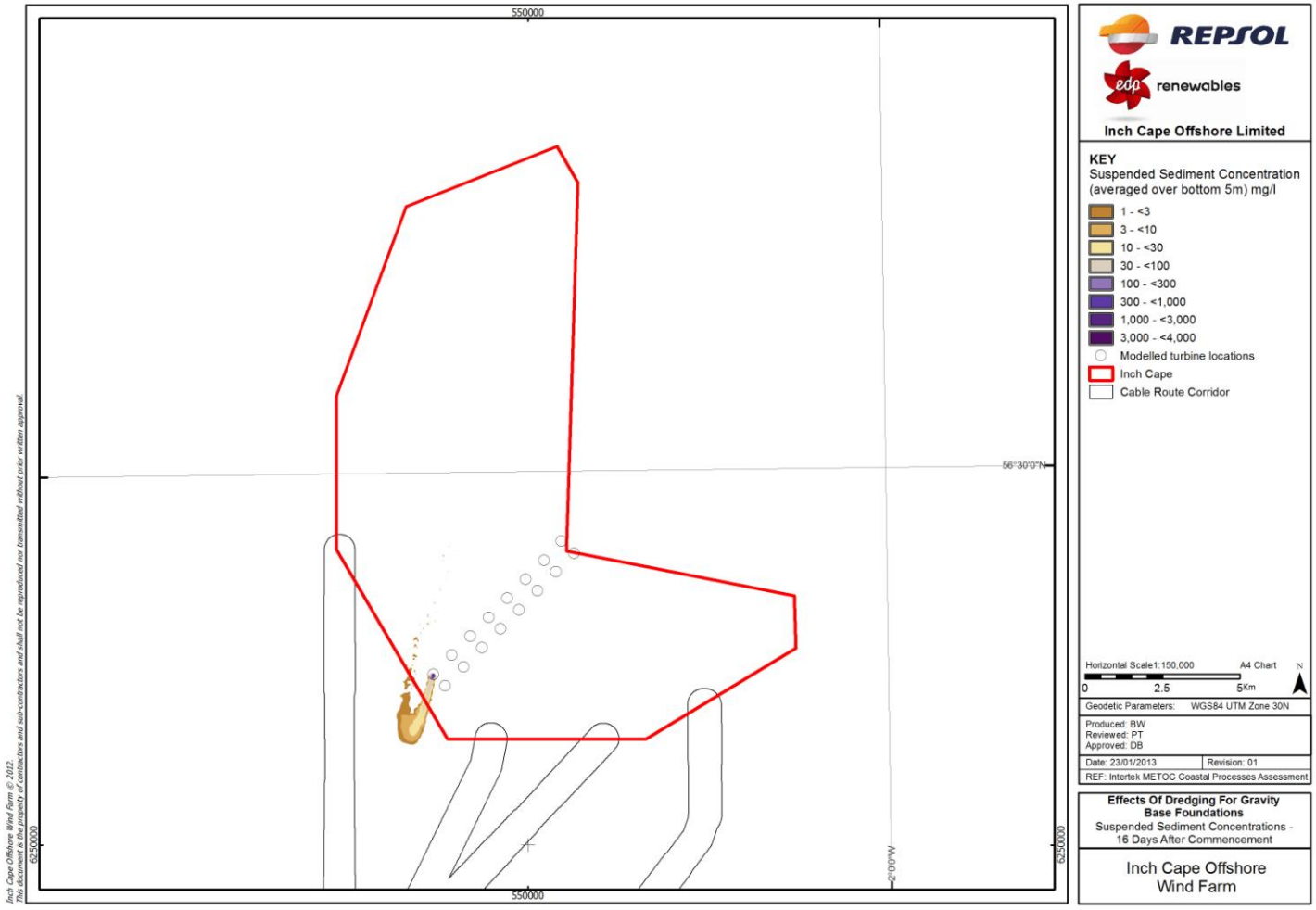
10A.7.52: Suspended sediment concentrations due to dredging: 14 days after commencement



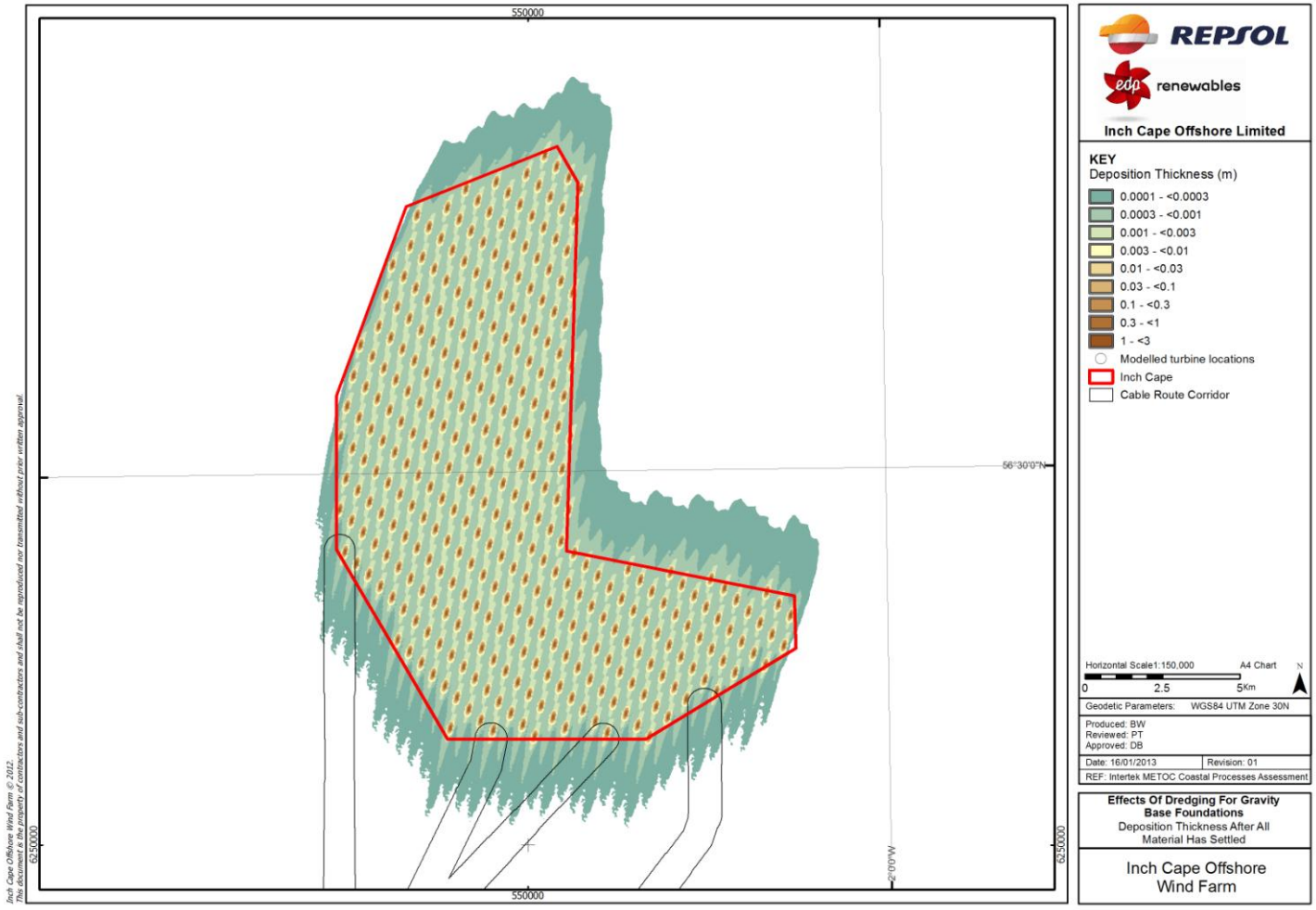
10A.7.53: Suspended sediment concentrations due to dredging: 15 days after commencement



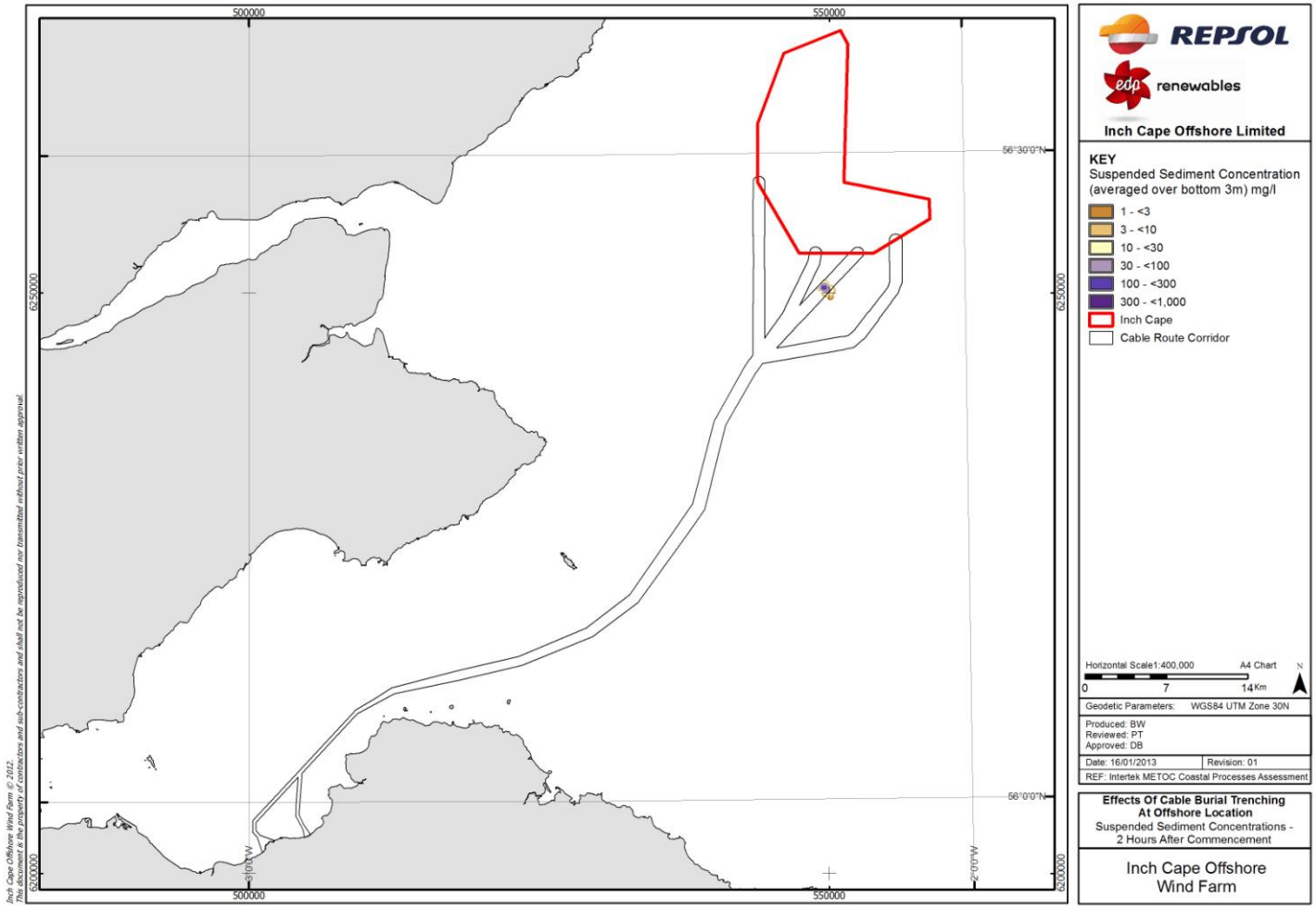
10A.7.54: Suspended sediment concentrations due to dredging: 16 days after commencement



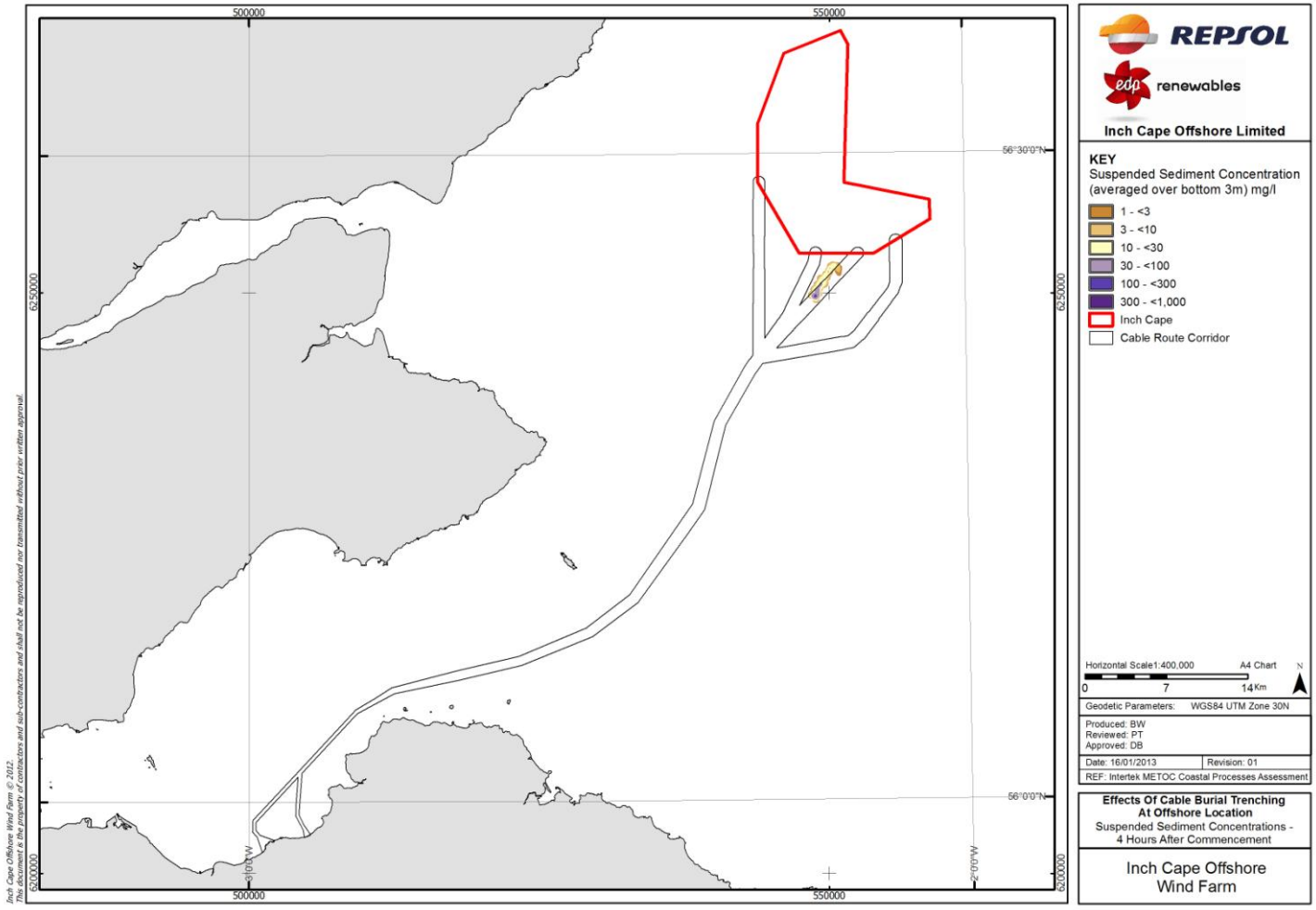
10A.7.55: Deposition thickness due to dredging – after all material has settled



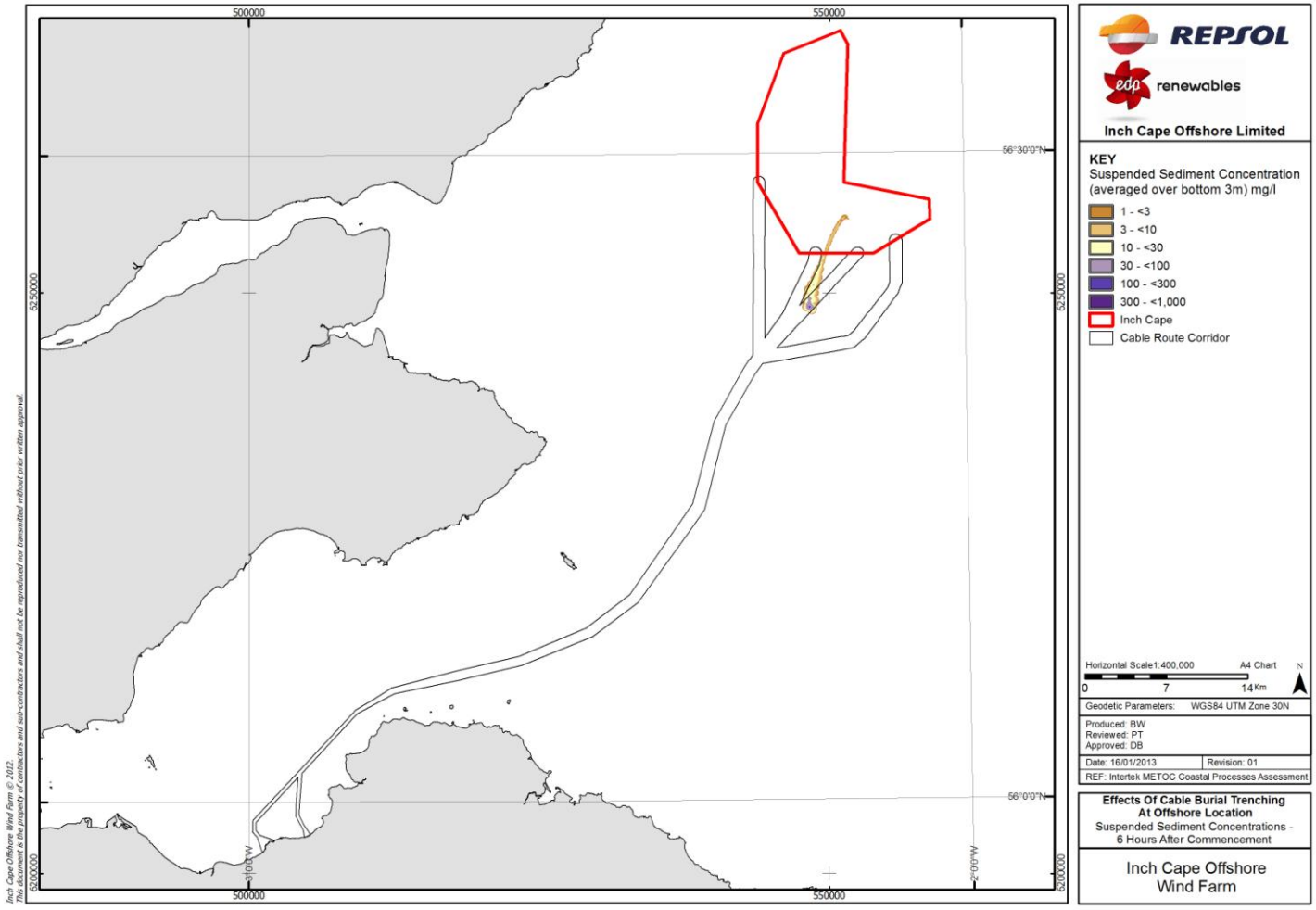
10A.7.56: Suspended sediment concentration due to cable trenching – offshore area: 2 hours after commencement



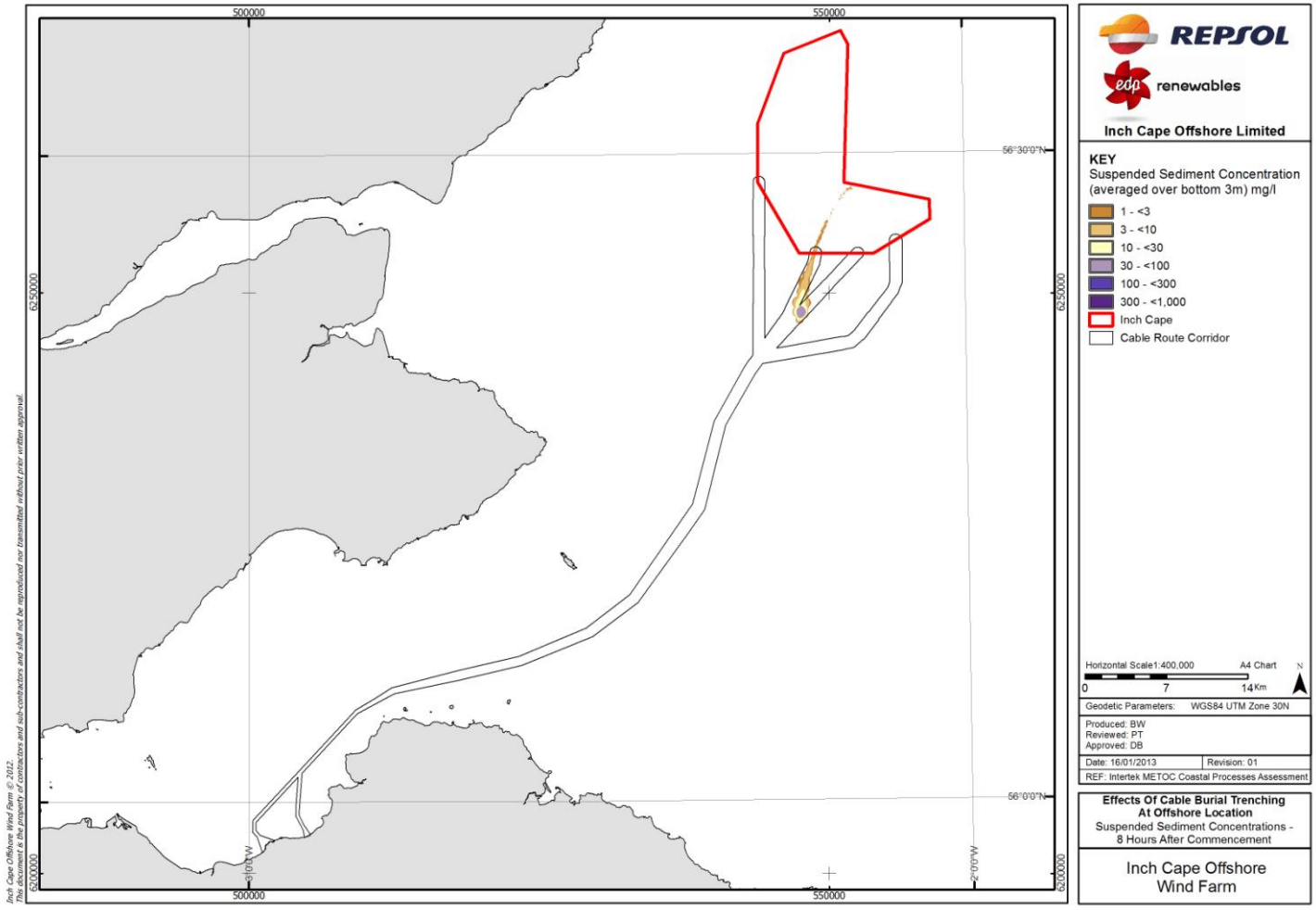
10A.7.57: Suspended sediment concentration due to cable trenching – offshore area: 4 hours after commencement



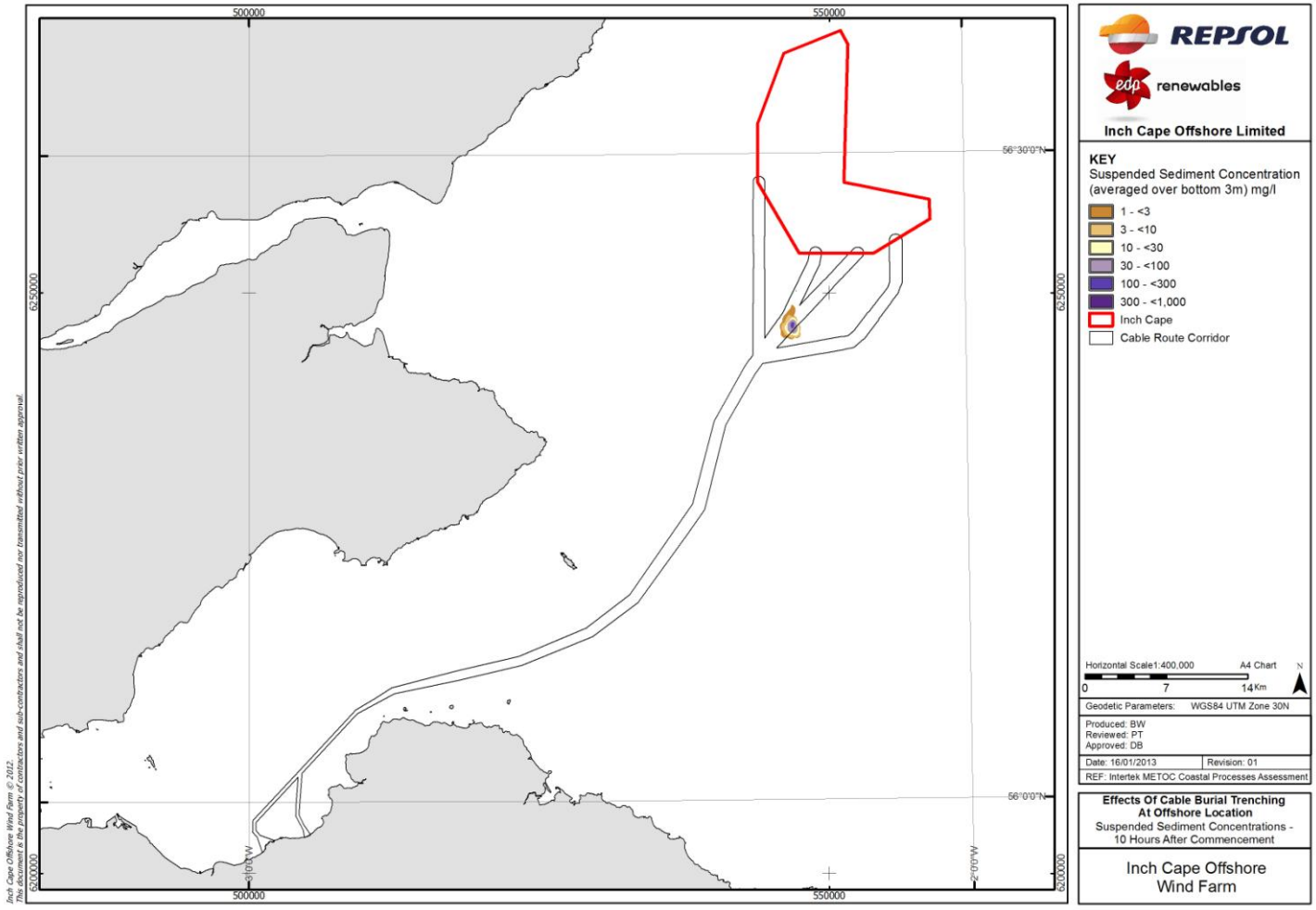
10A.7.58: Suspended sediment concentration due to cable trenching – offshore area: 6 hours after commencement



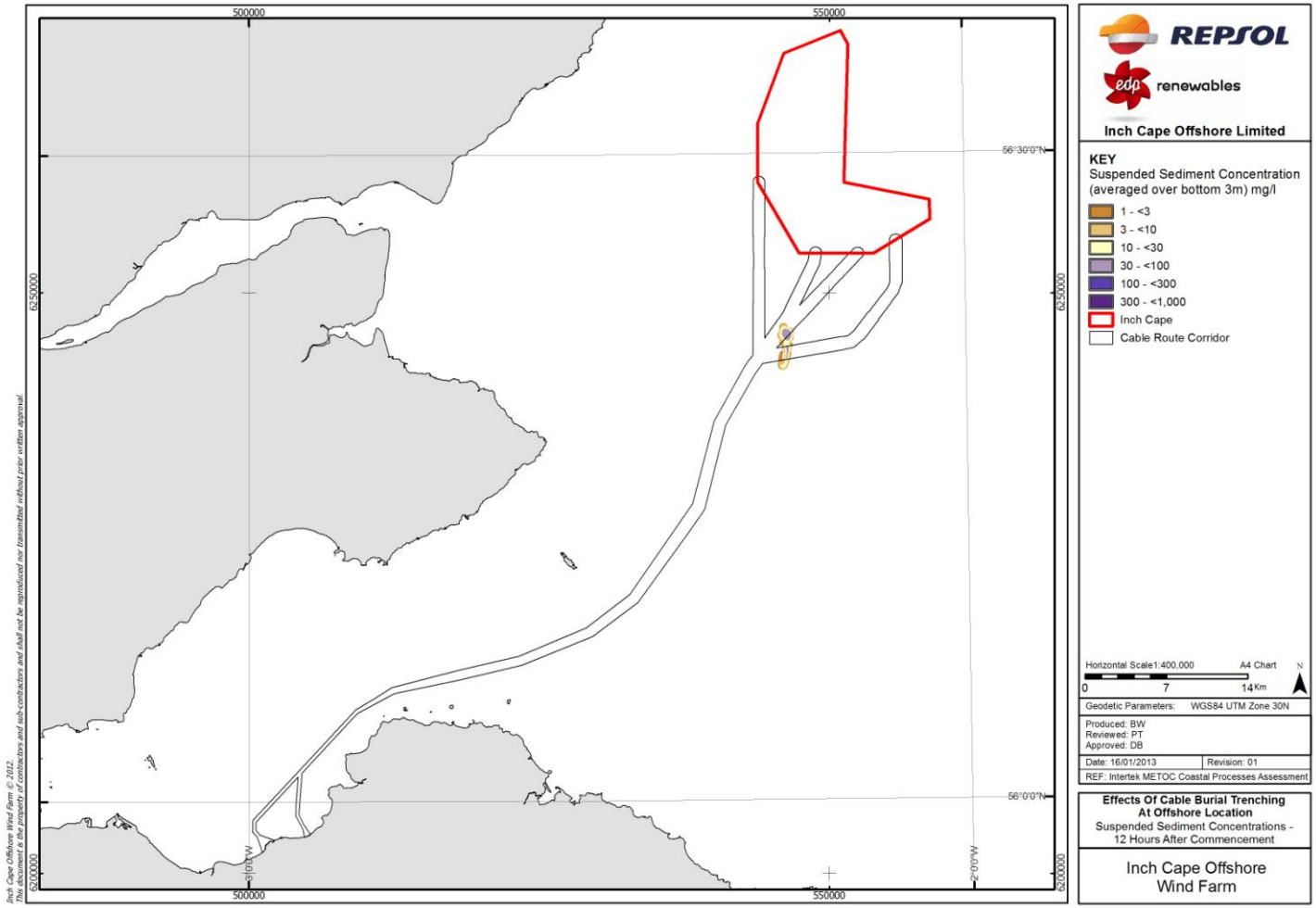
10A.7.59: Suspended sediment concentration due to cable trenching – offshore area: 8 hours after commencement



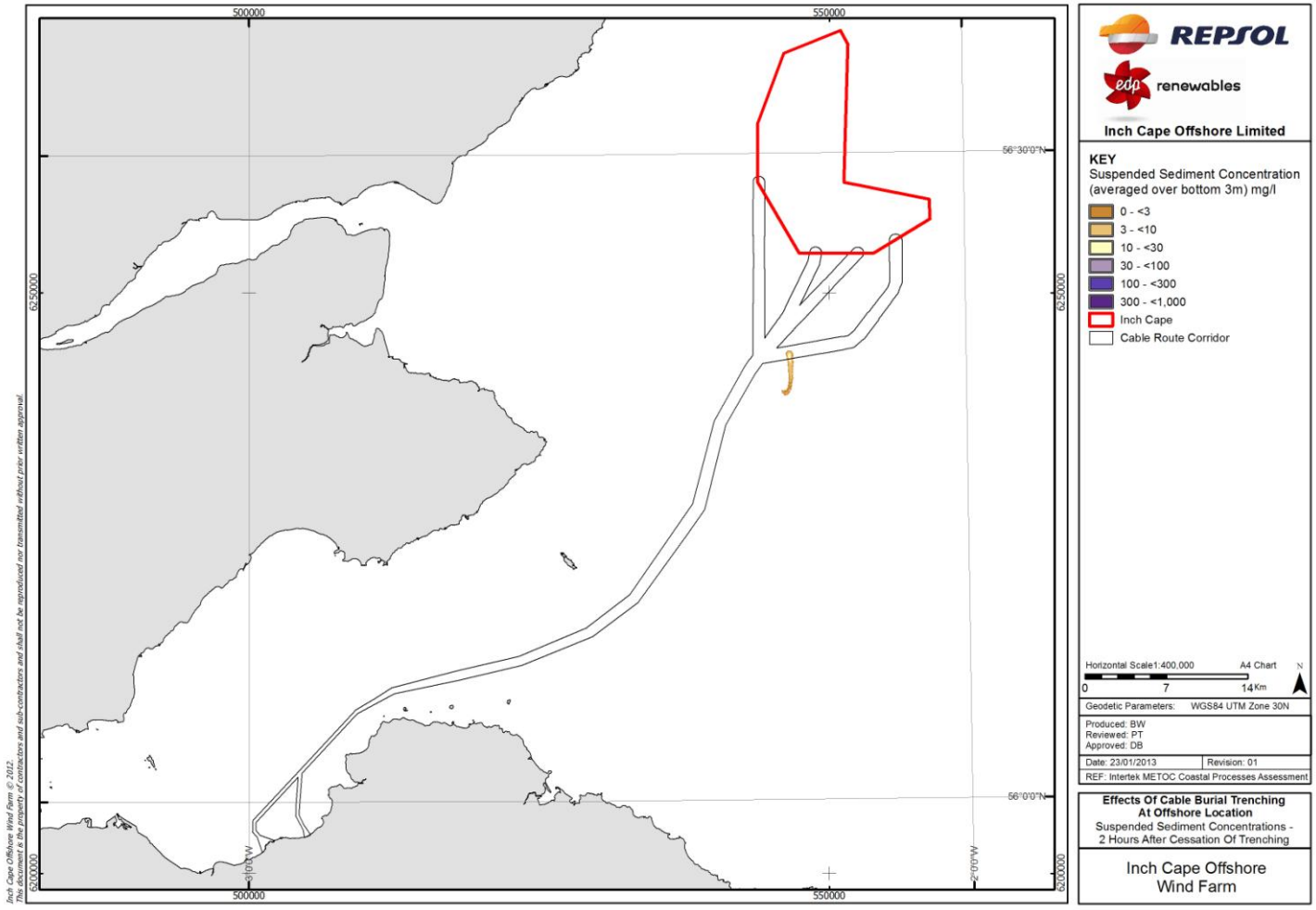
10A.7.60: Suspended sediment concentration due to cable trenching – offshore area: 10 hours after commencement



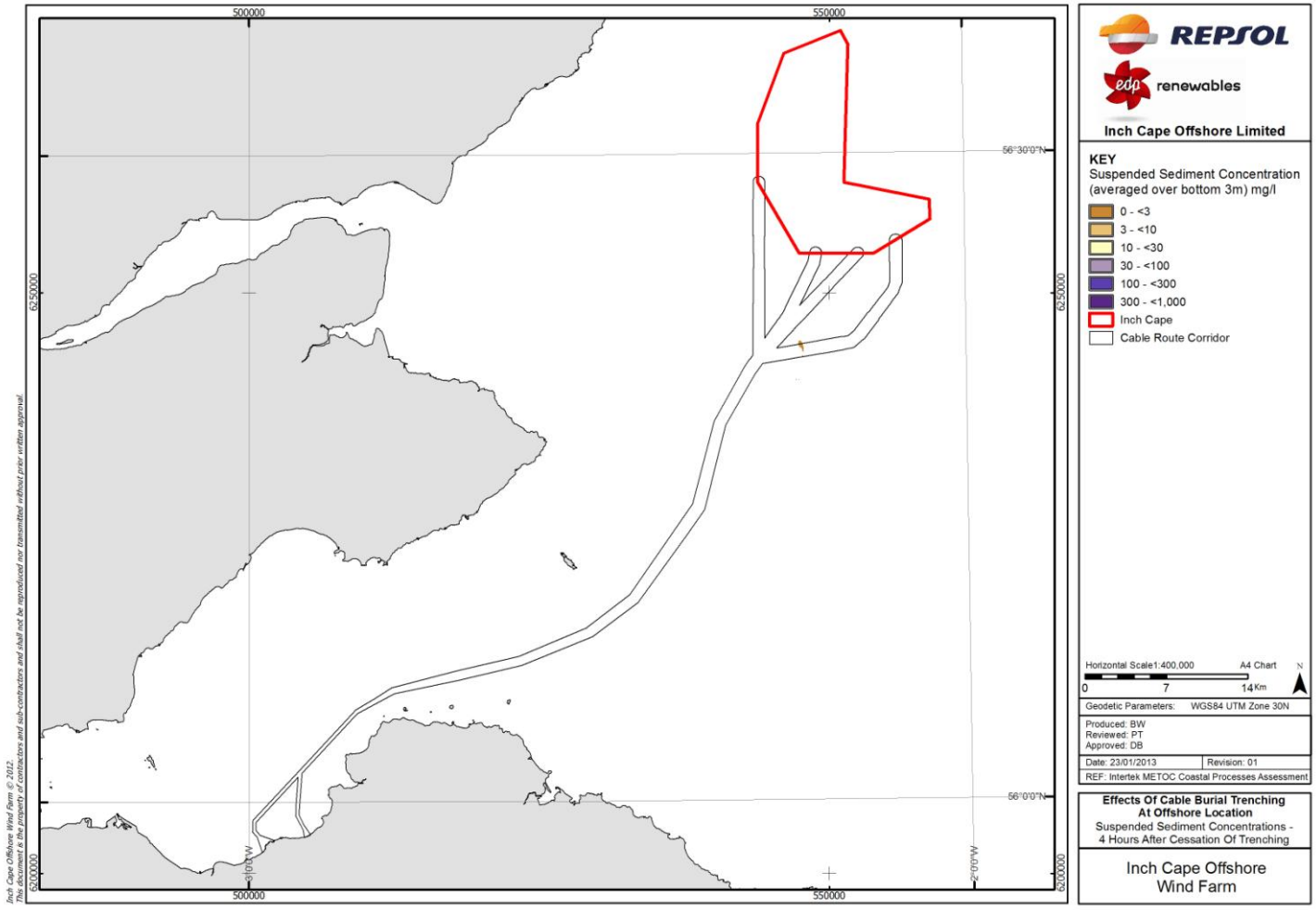
10A.7.61: Suspended sediment concentration due to cable trenching – offshore area: 12 hours after commencement



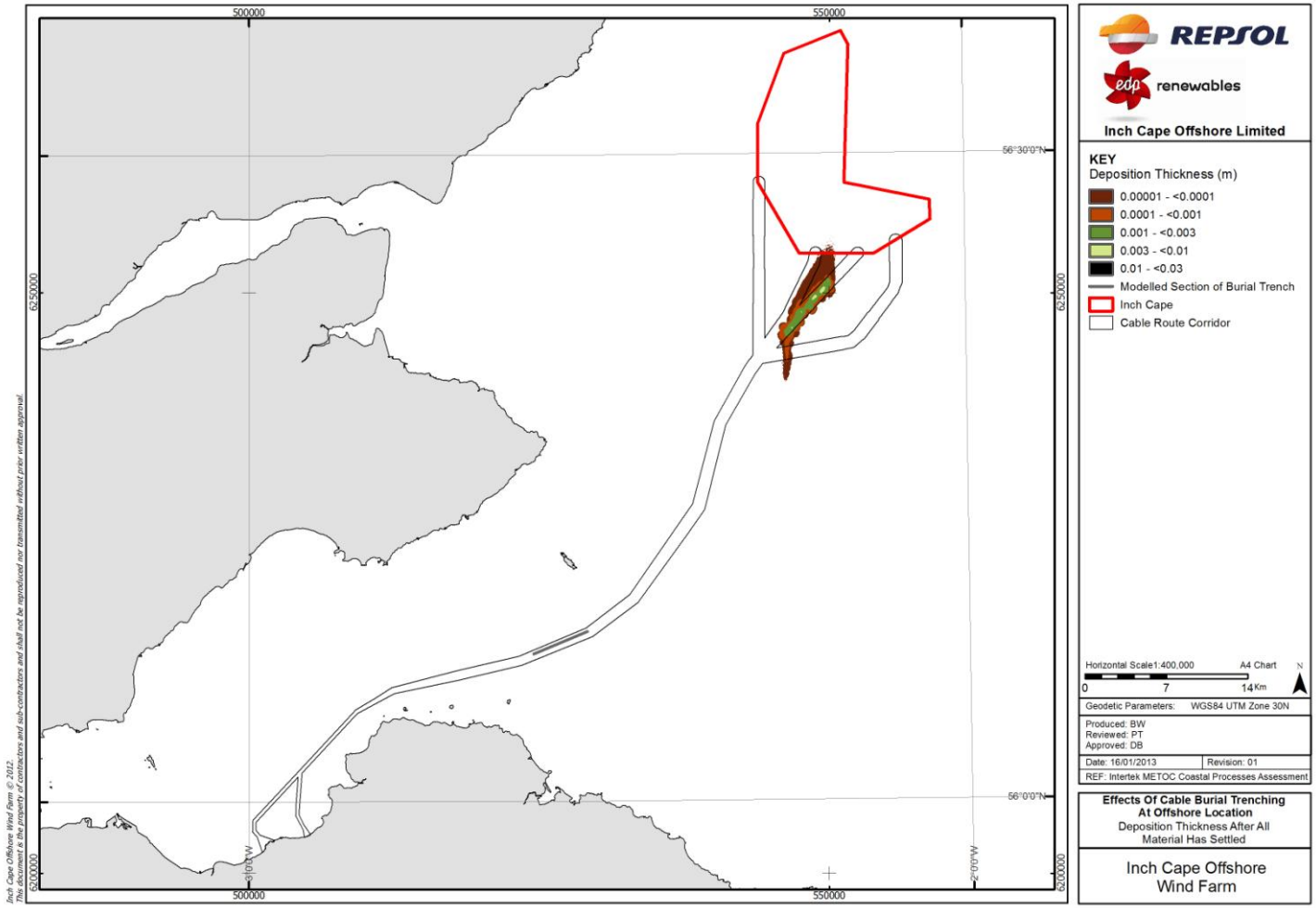
10A.7.62: Suspended sediment concentration due to cable trenching – offshore area: 2 hours after cessation of trenching



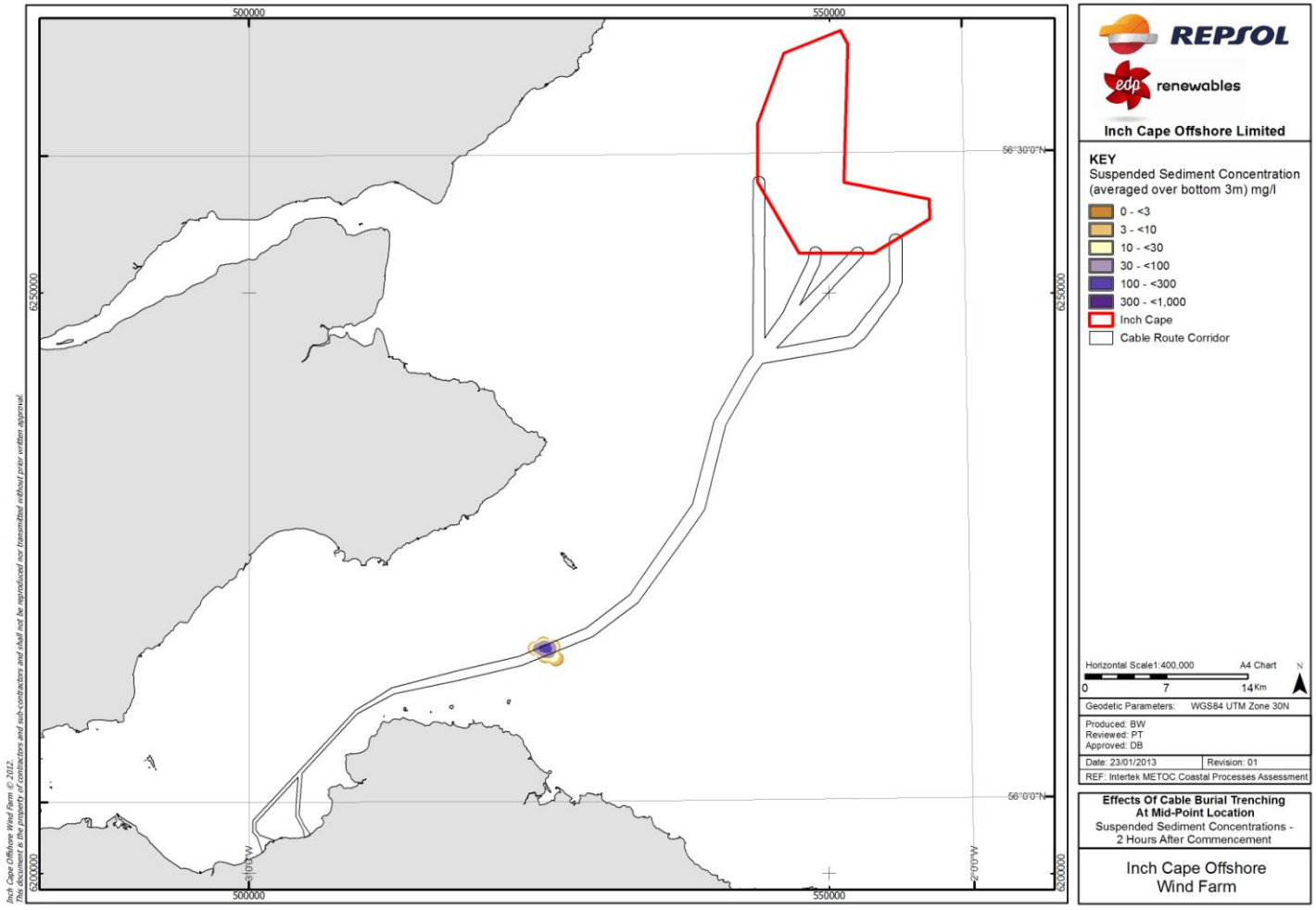
10A.7.63: Suspended sediment concentration due to cable trenching – offshore area: 4 hours after cessation of trenching



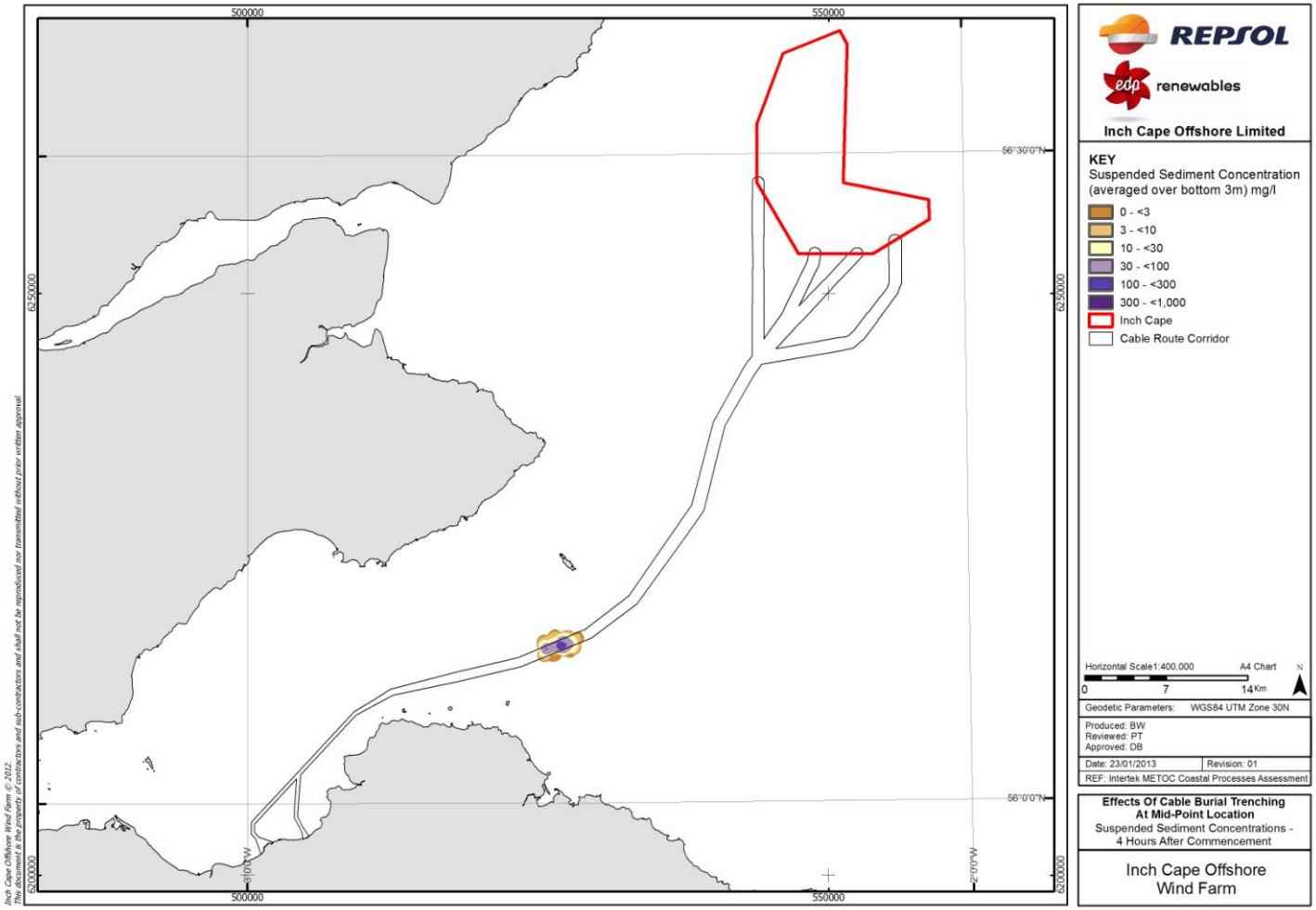
10A.7.64: Deposition thickness due to cable trenching – offshore area: after all disturbed material has settled



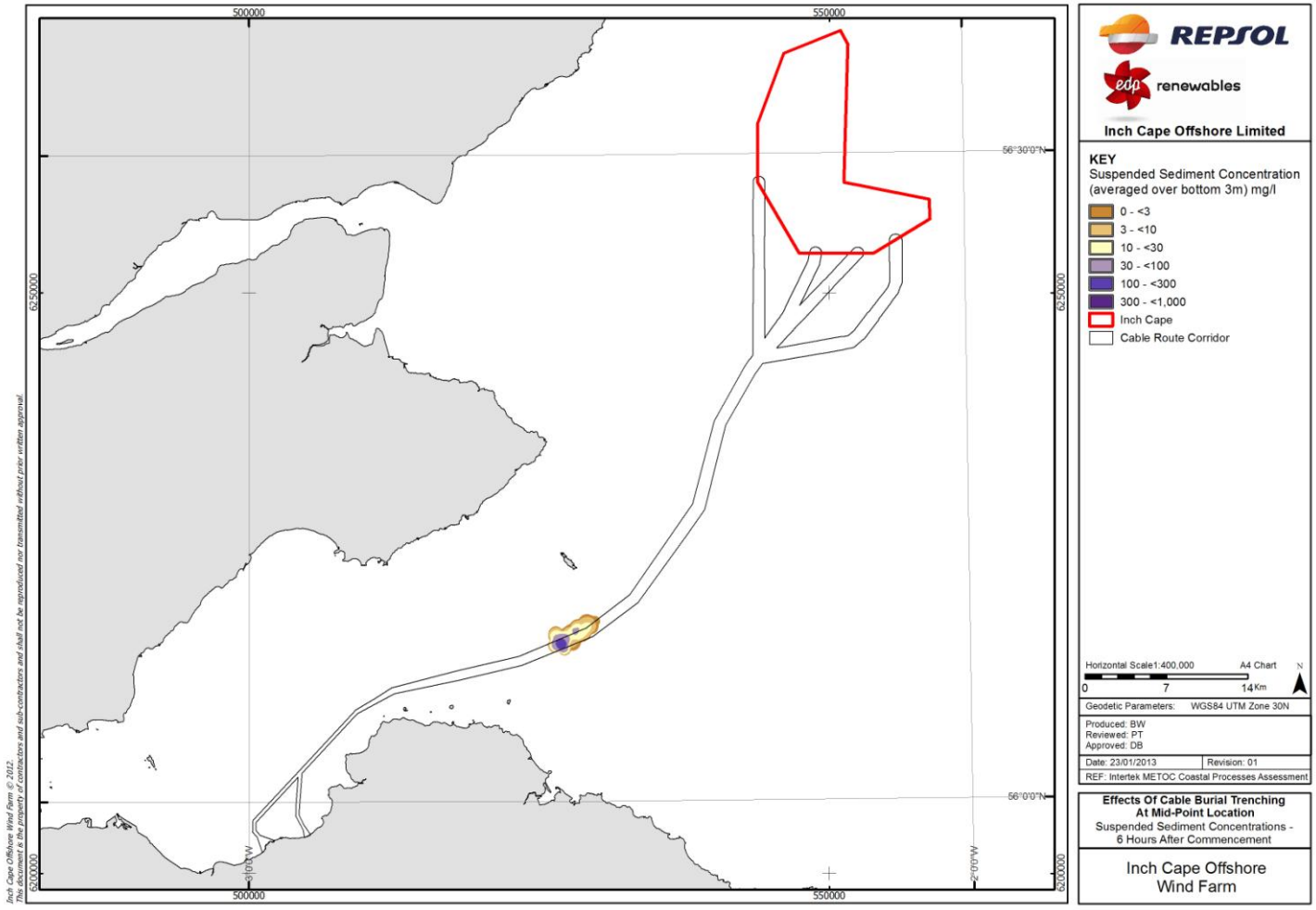
10A.7.65: Suspended sediment concentration due to cable trenching – midpoint area: 2 hours after commencement



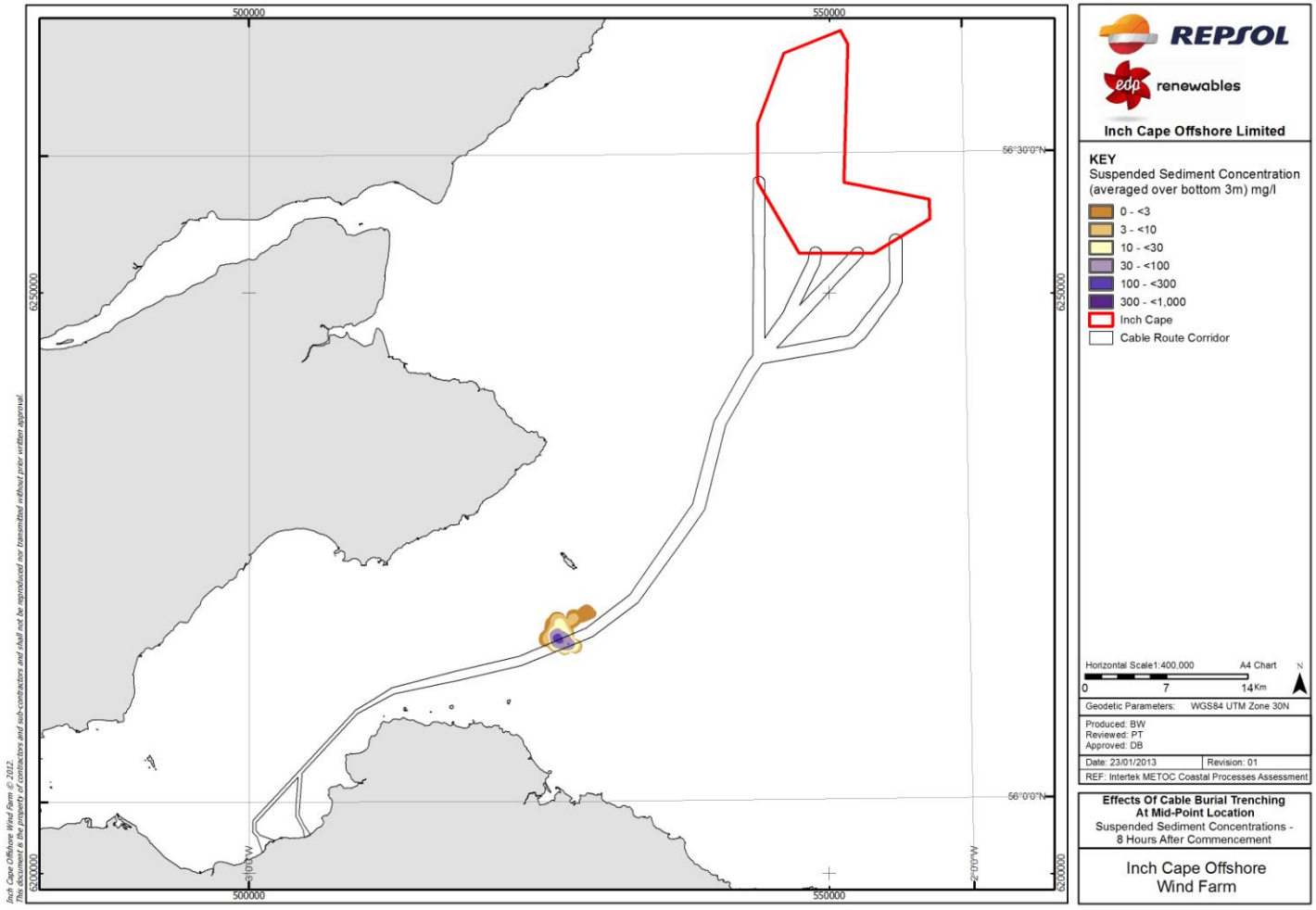
10A.7.66: Suspended sediment concentration due to cable trenching – midpoint area: 4 hours after commencement



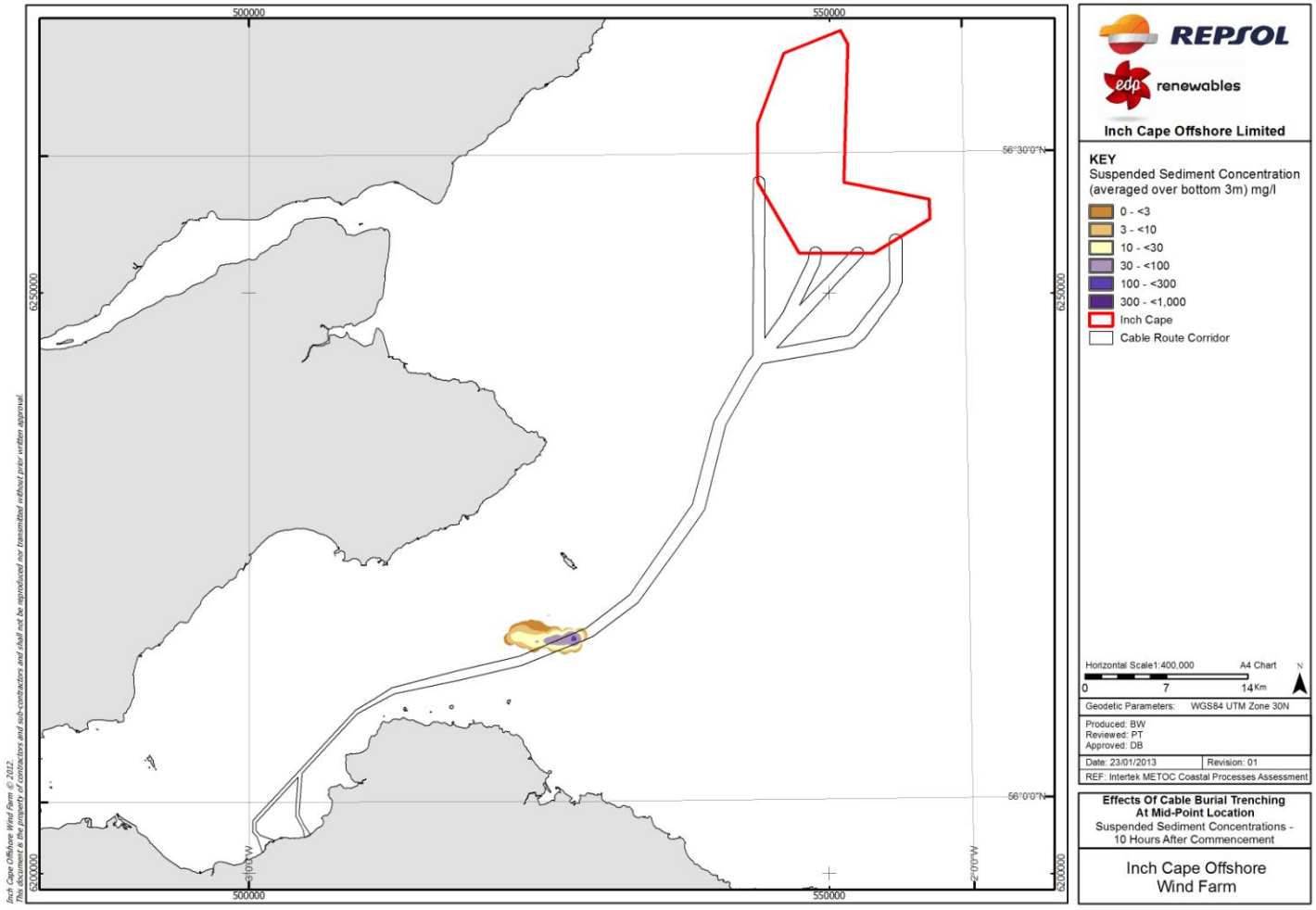
10A.7.67: Suspended sediment concentration due to cable trenching – midpoint area: 6 hours after commencement



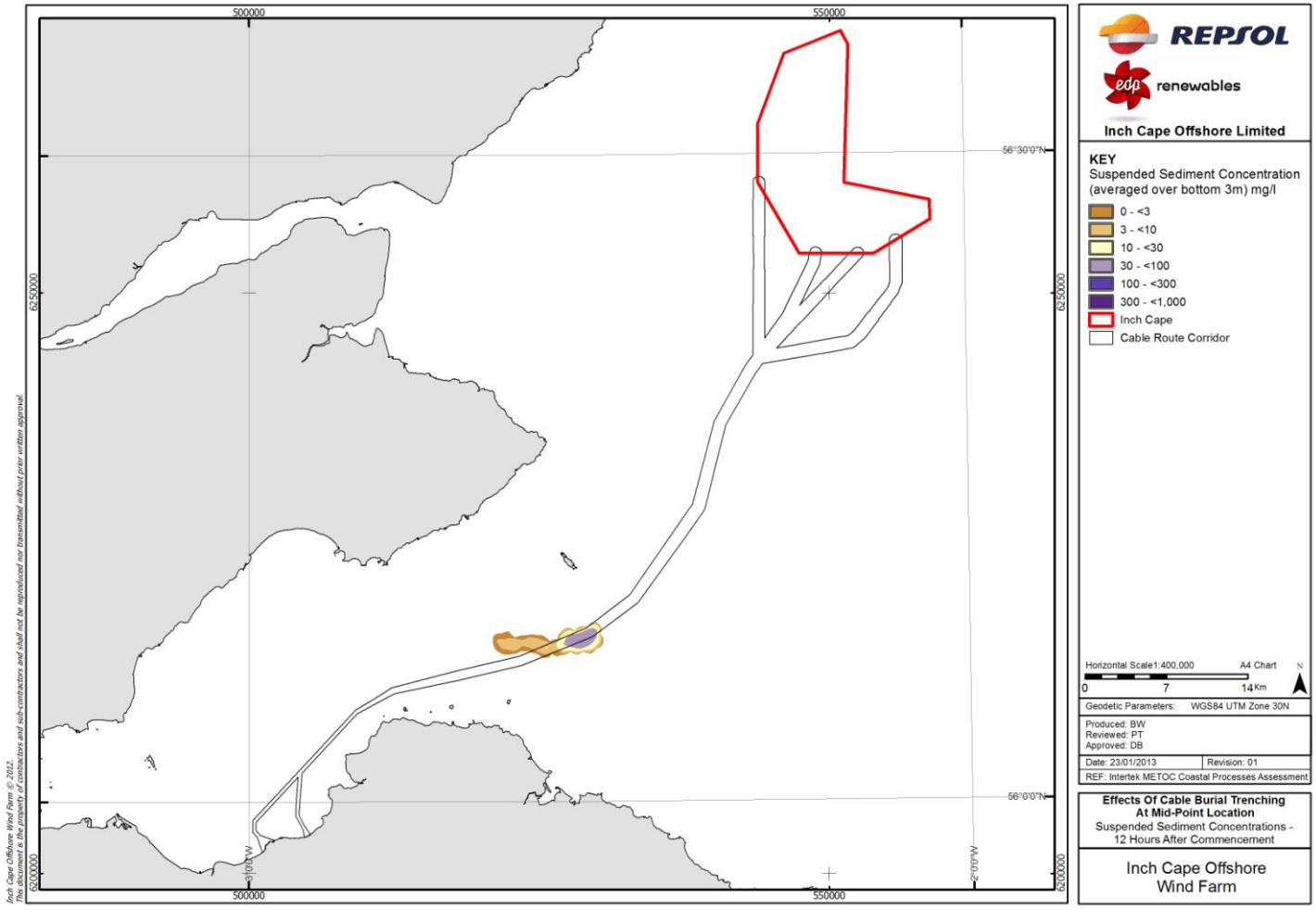
10A.7.68: Suspended sediment concentration due to cable trenching – midpoint area: 8 hours after commencement



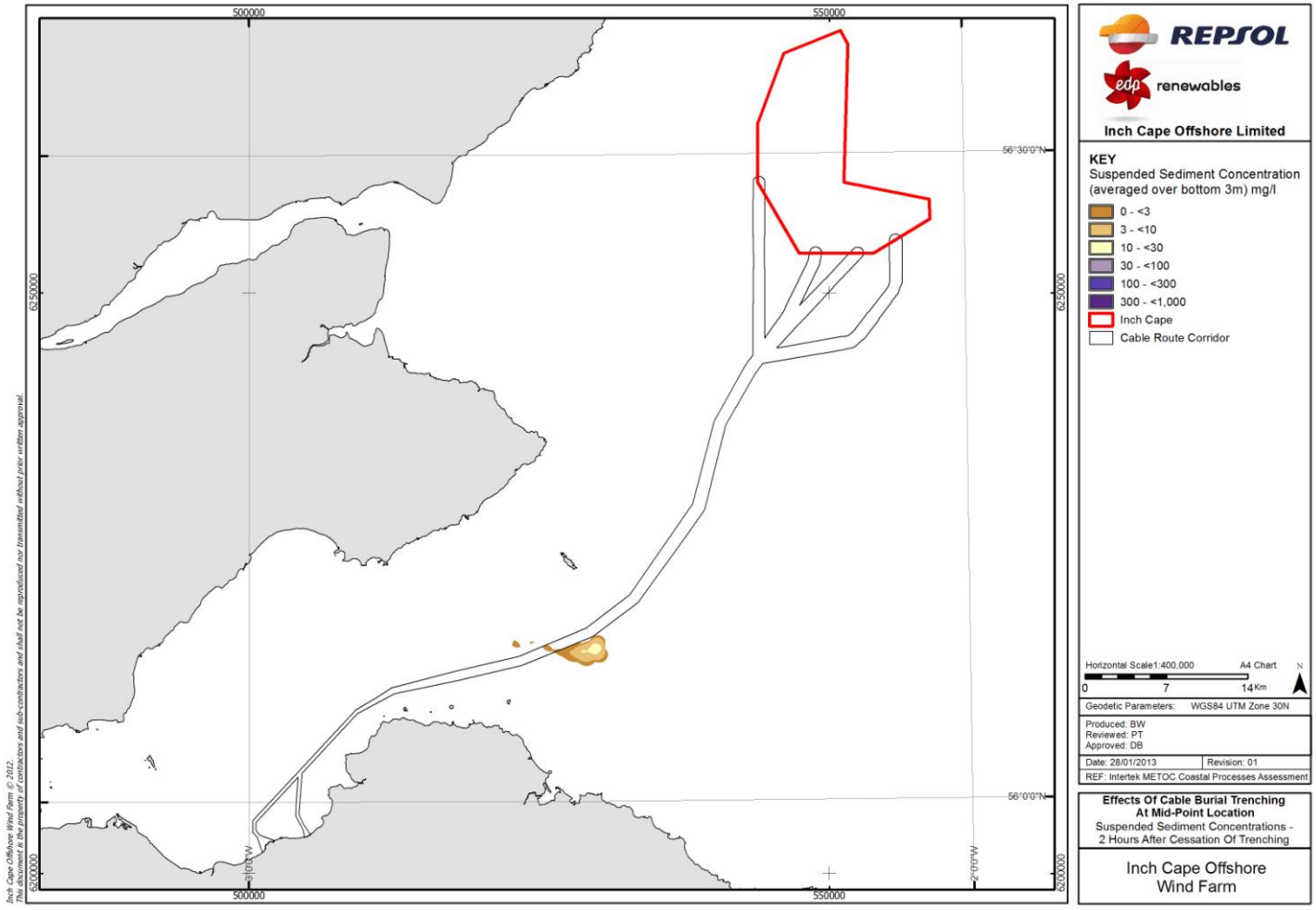
10A.7.69: Suspended sediment concentration due to cable trenching – midpoint area: 10 hours after commencement



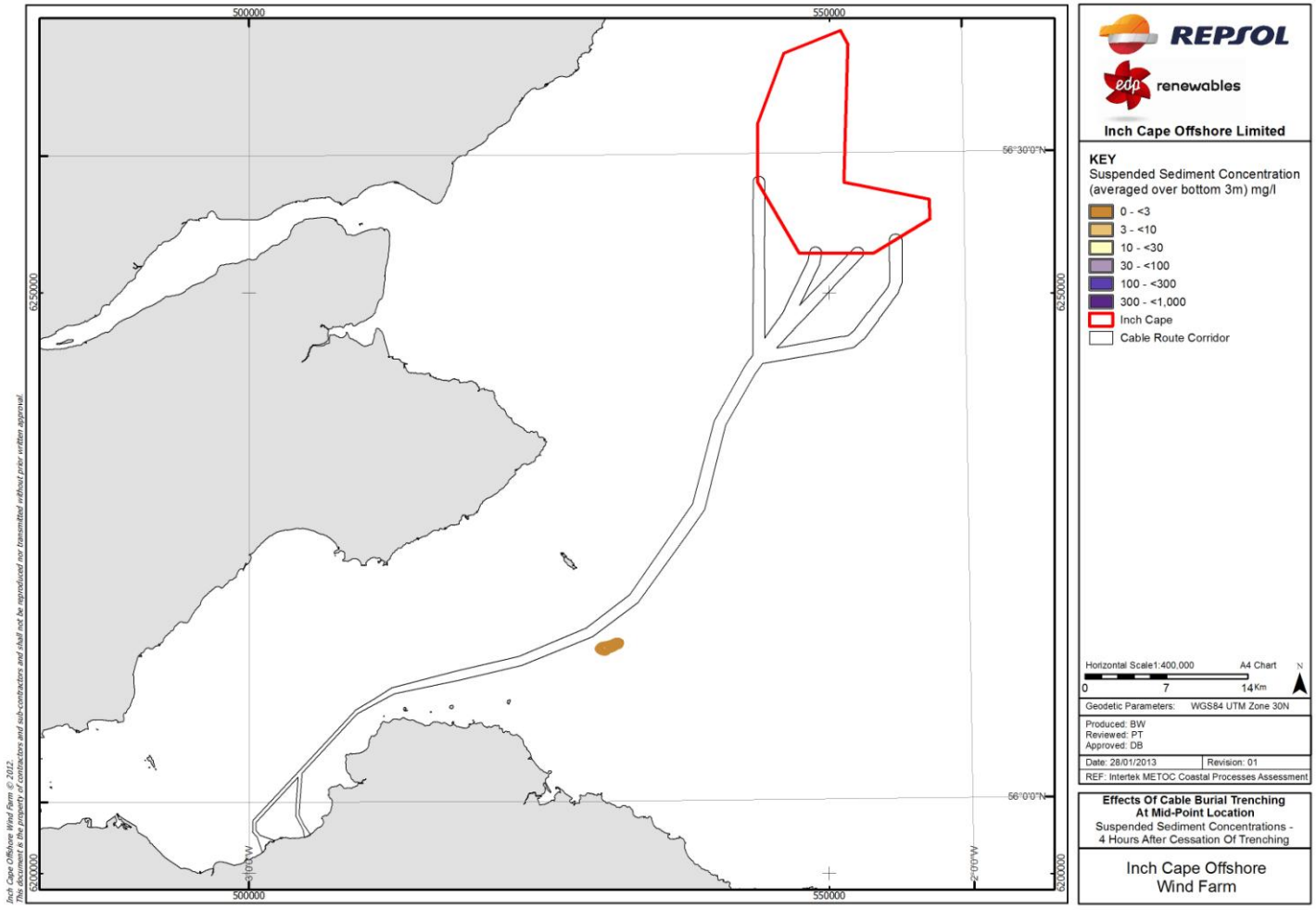
10A.7.70: Suspended sediment concentration due to cable trenching – midpoint area: 12 hours after commencement



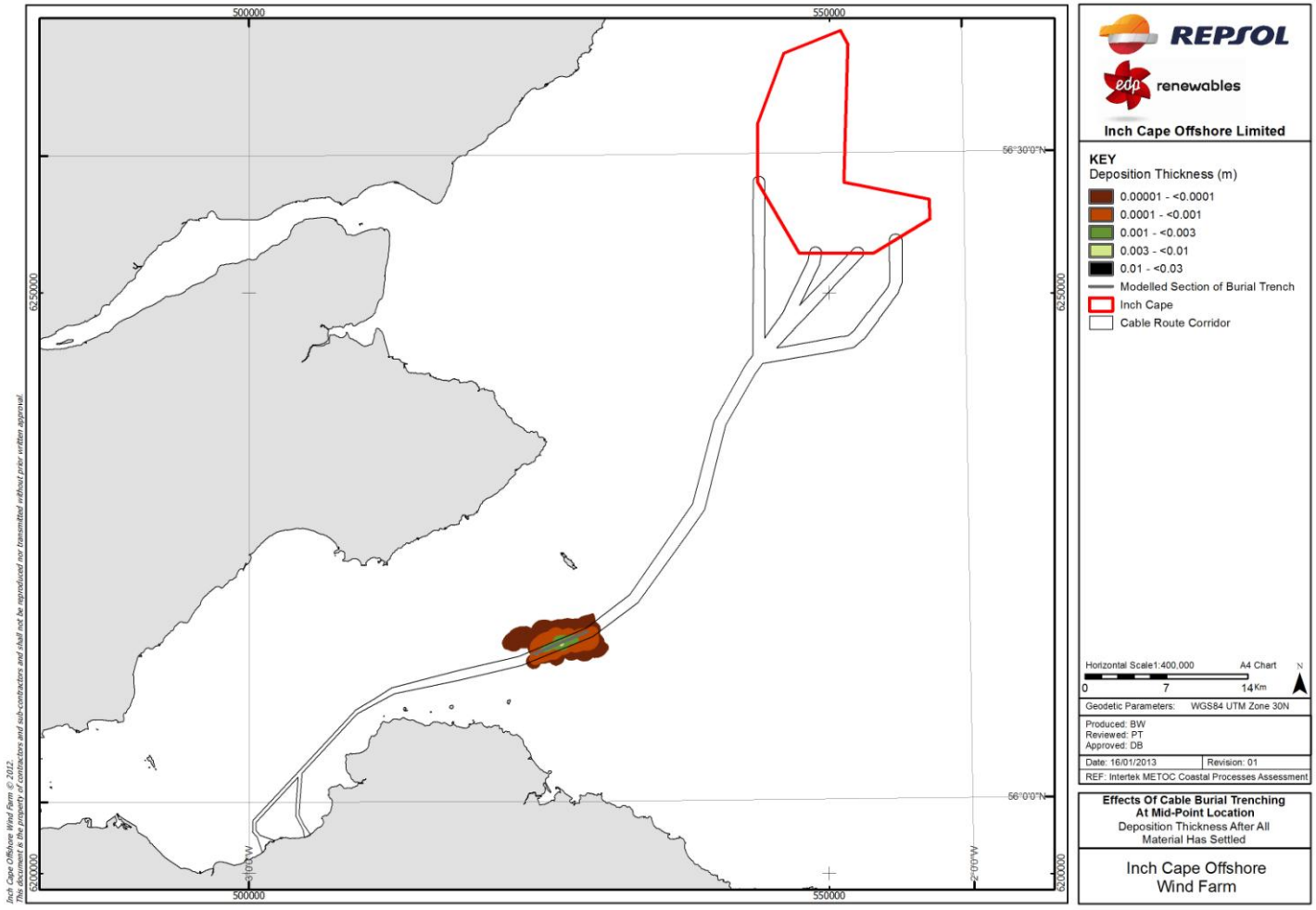
10A.7.71: Suspended sediment concentration due to cable trenching – midpoint area: 2 hours after cessation of trenching



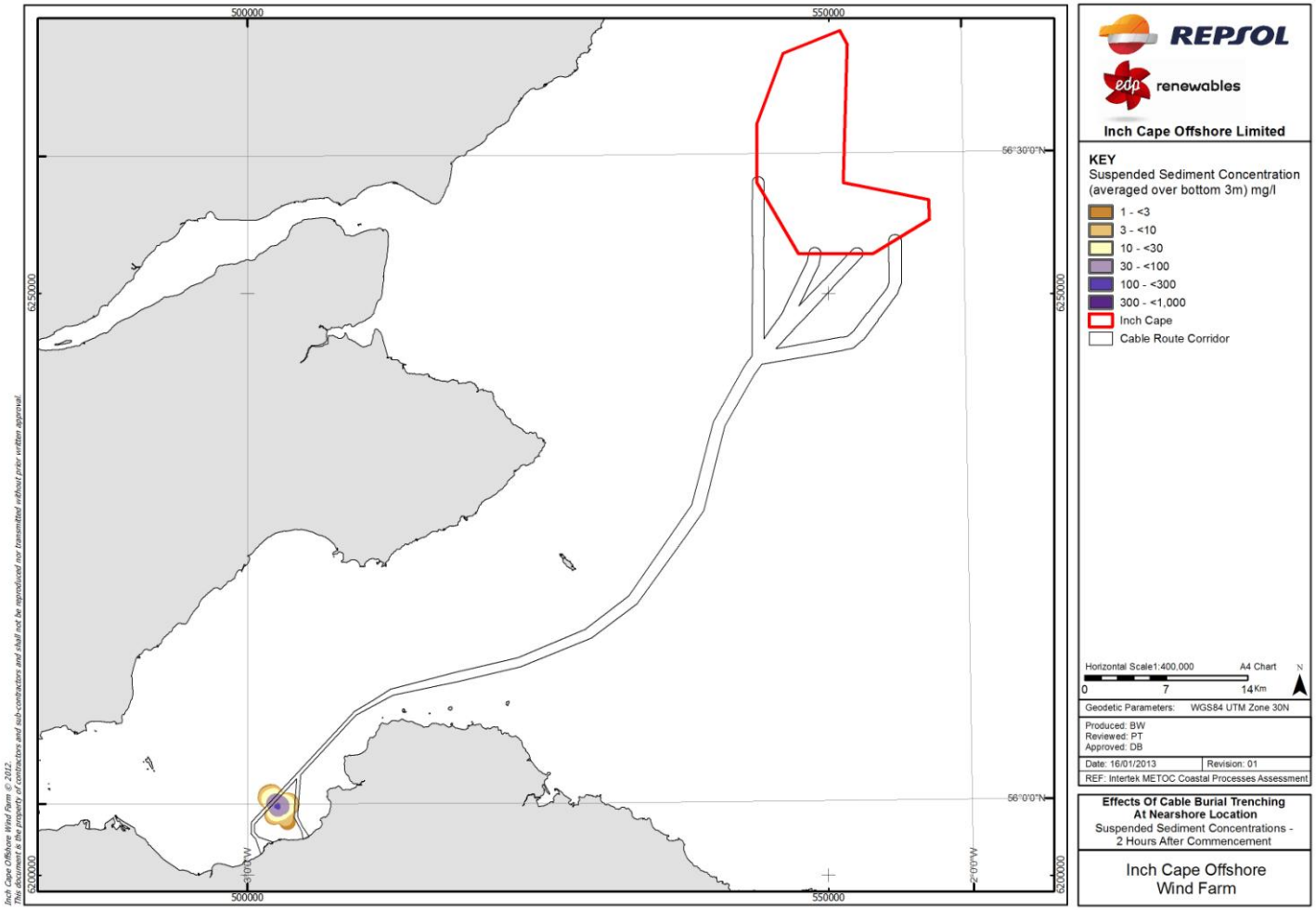
10A.7.72: Suspended sediment concentration due to cable trenching – midpoint area: 4 hours after cessation of trenching



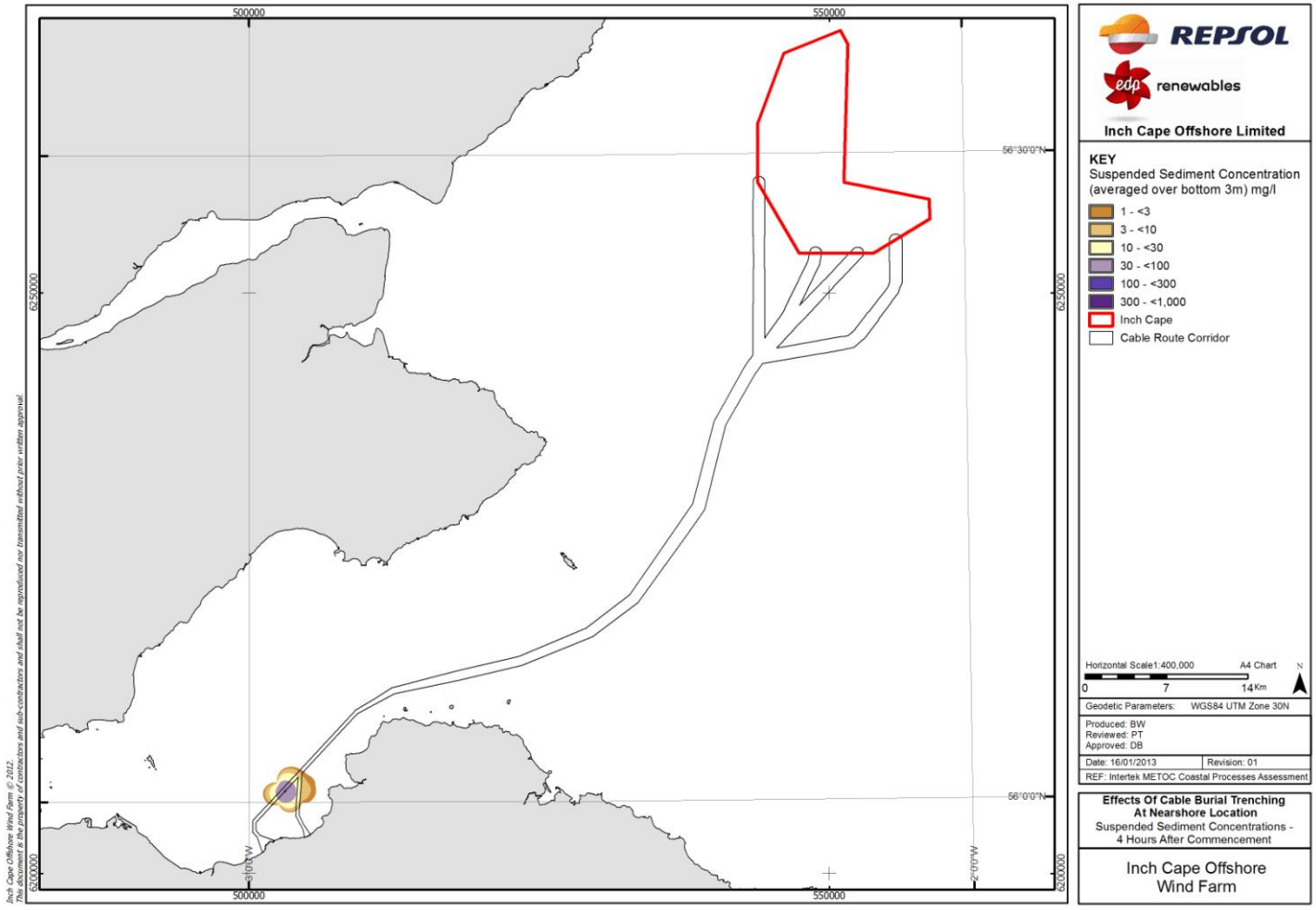
10A.7.73: Deposition thickness due to cable trenching – midpoint area: after all disturbed material has settled



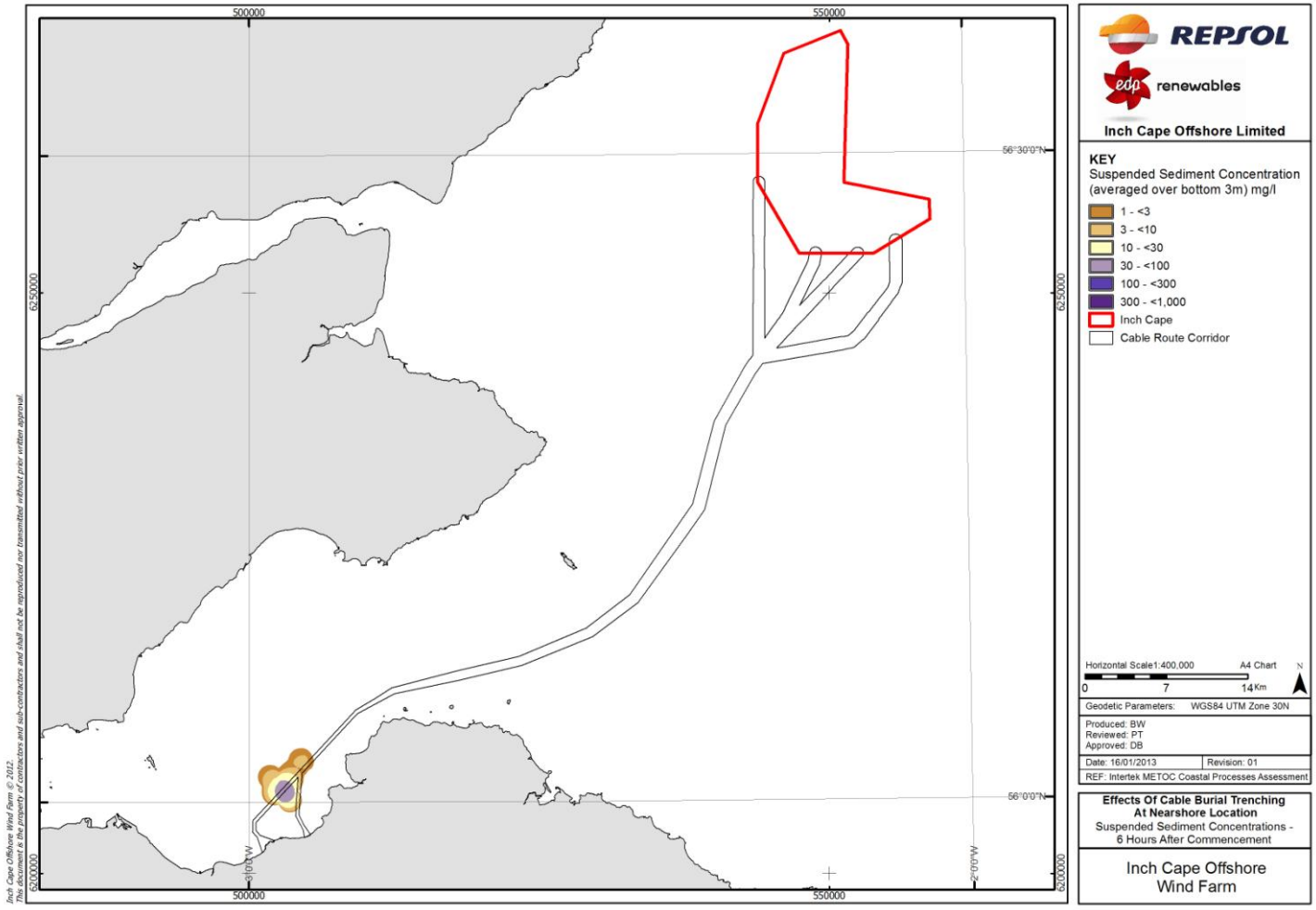
10A.7.74: Suspended sediment concentration due to cable trenching – nearshore area: 2 hours after commencement



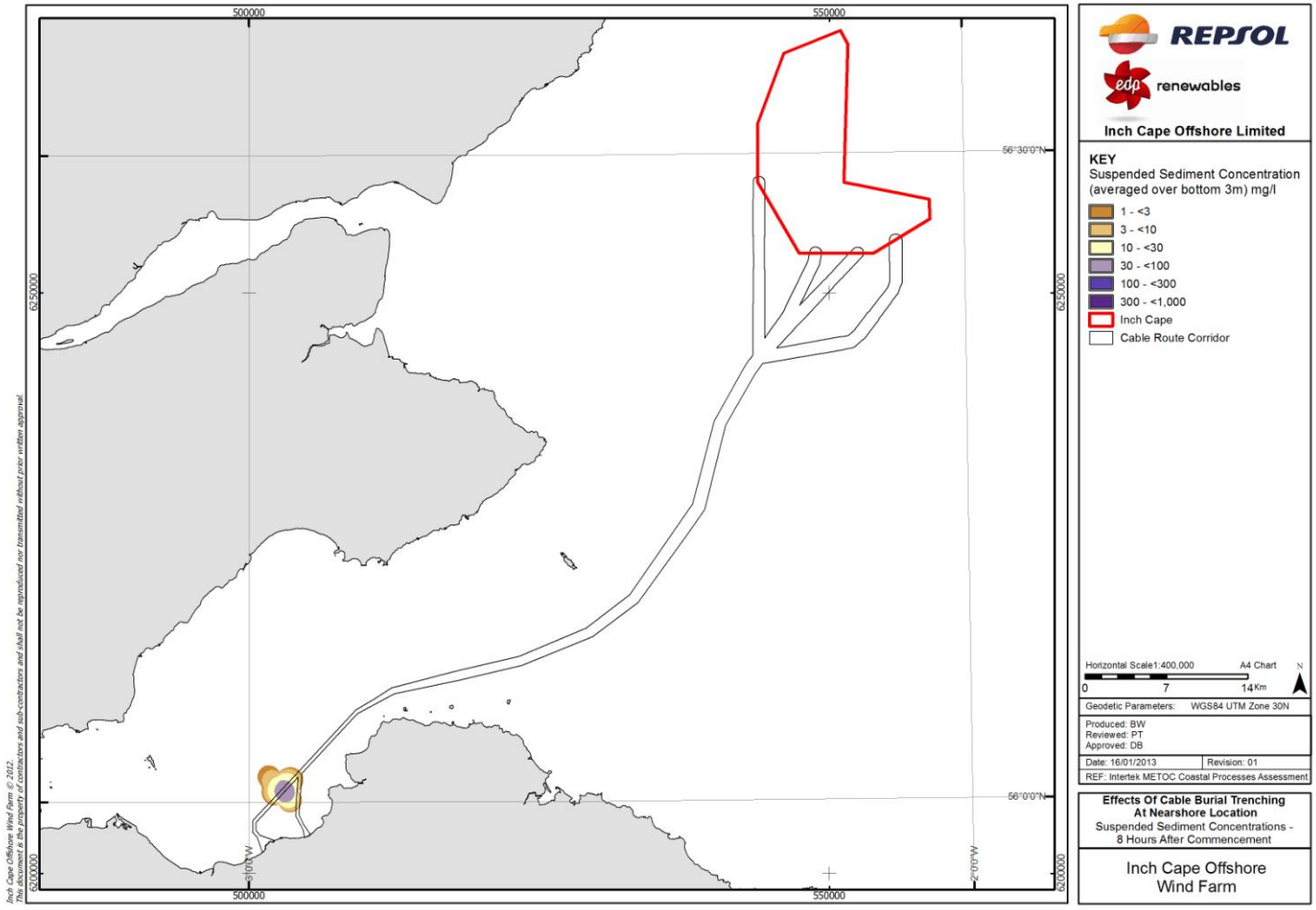
10A.7.75: Suspended sediment concentration due to cable trenching – nearshore area: 4 hours after commencement



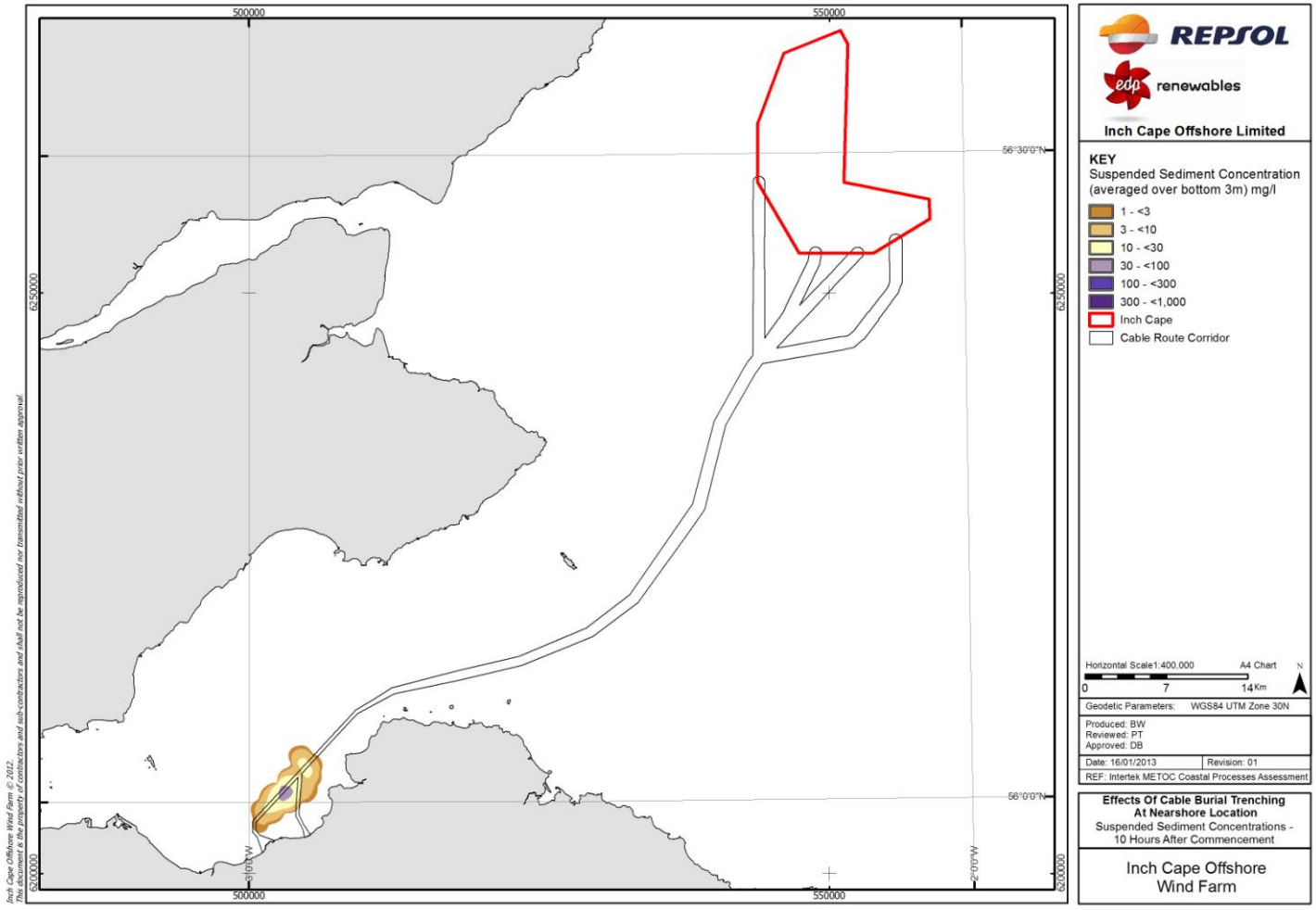
10A.7.76: Suspended sediment concentration due to cable trenching – nearshore area: 6 hours after commencement



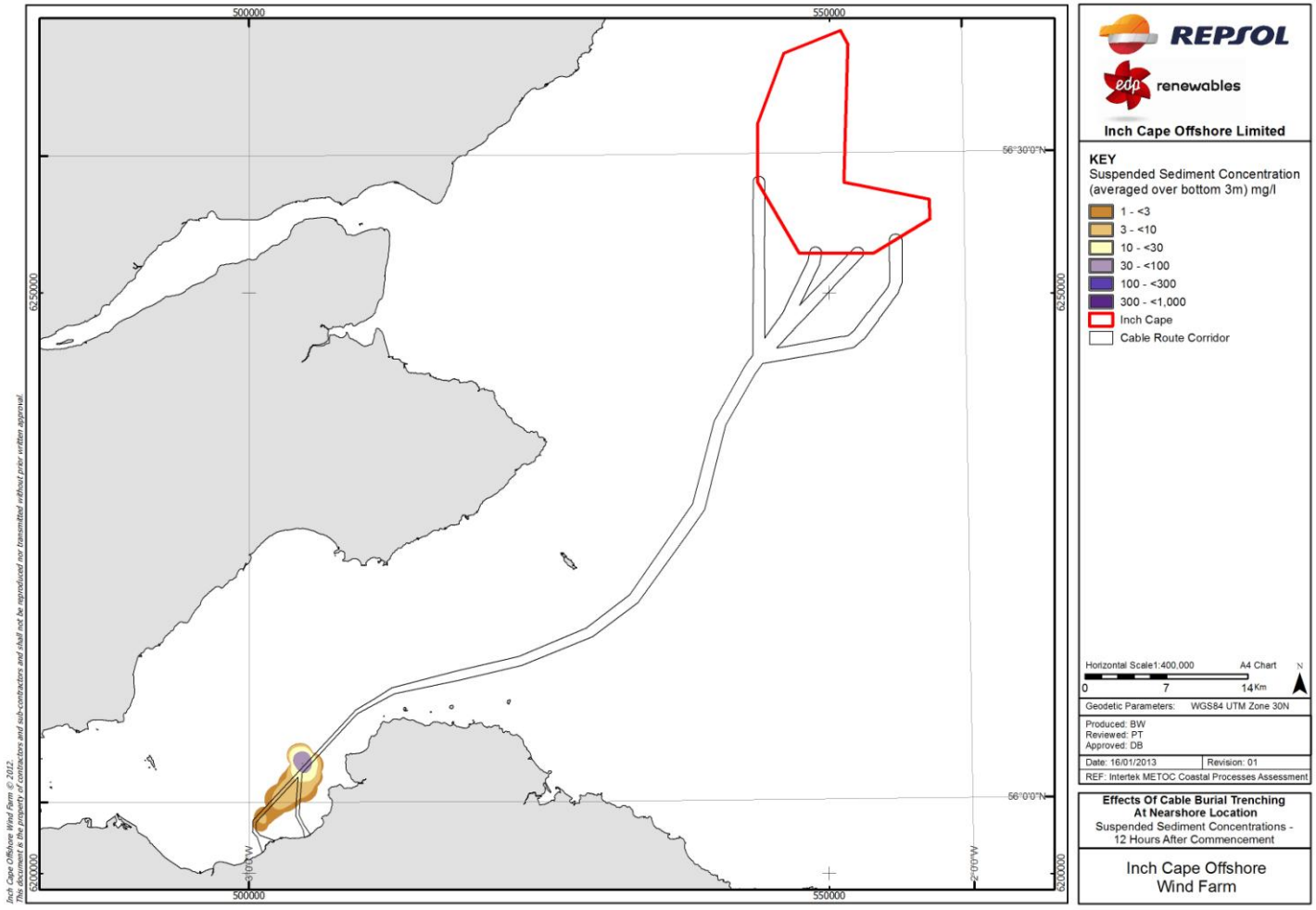
10A.7.77: Suspended sediment concentration due to cable trenching – nearshore area: 8 hours after commencement



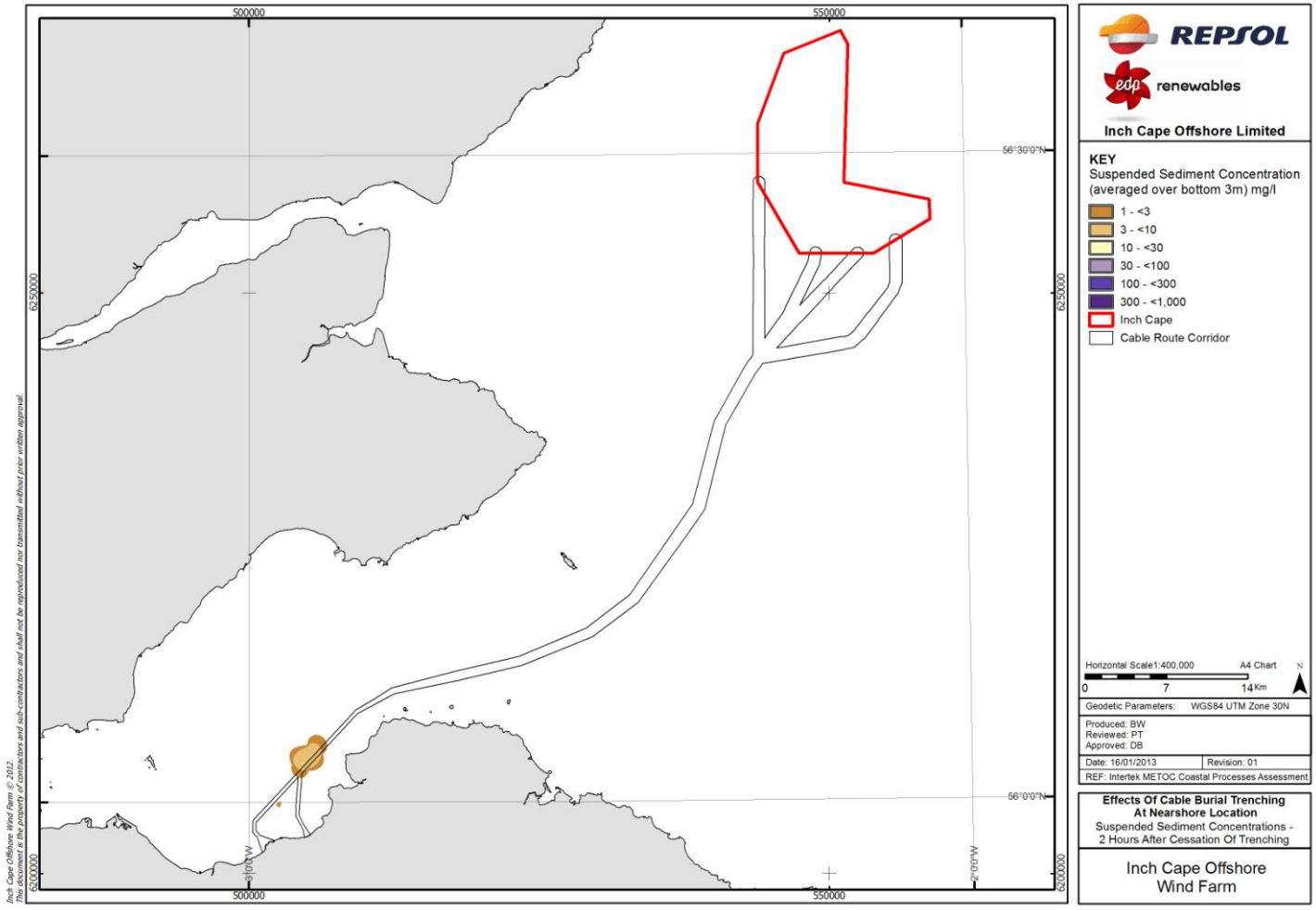
10A.7.78: Suspended sediment concentration due to cable trenching – nearshore area: 10 hours after commencement



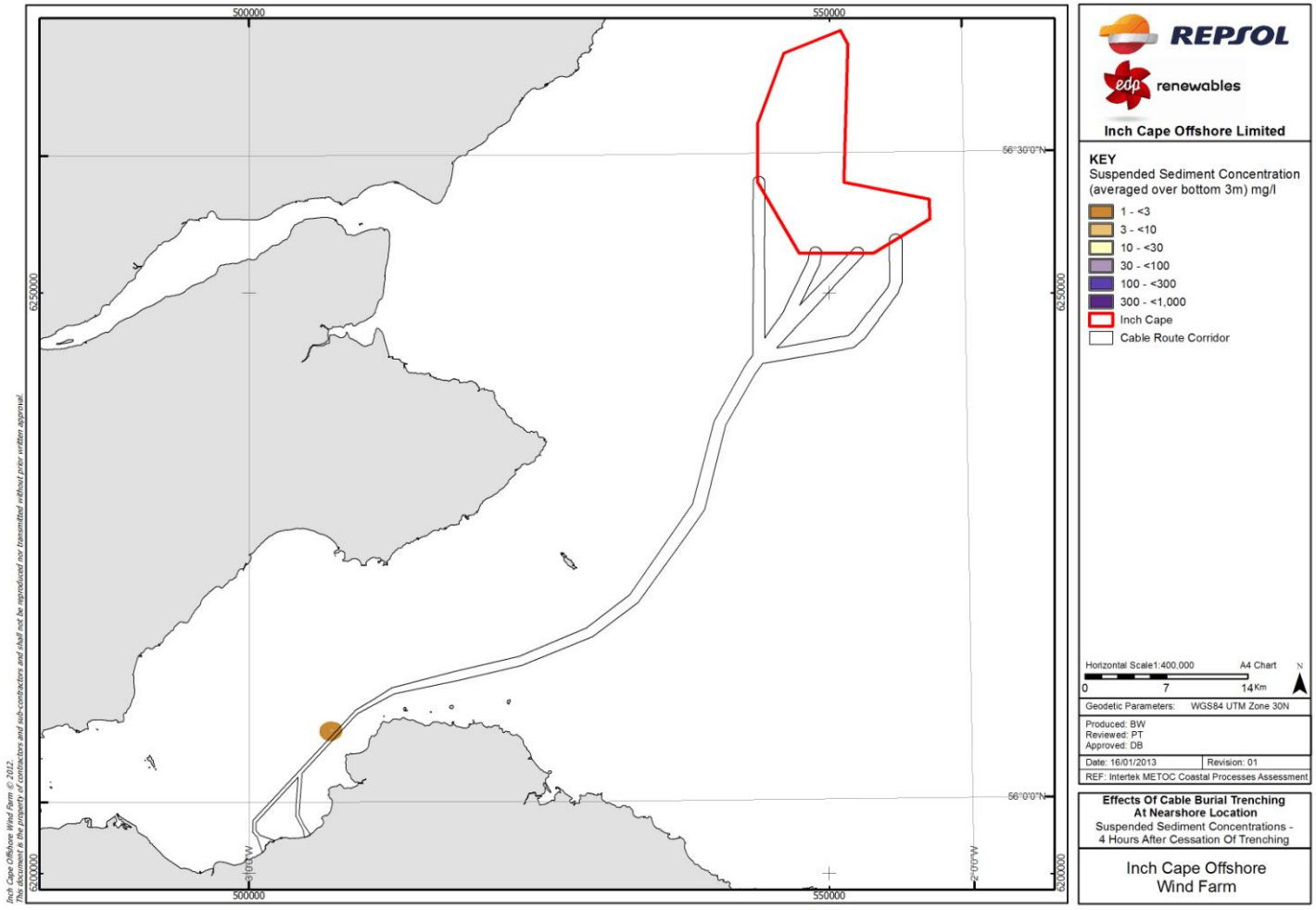
10A.7.79: Suspended sediment concentration due to cable trenching – nearshore area: 12 hours after commencement



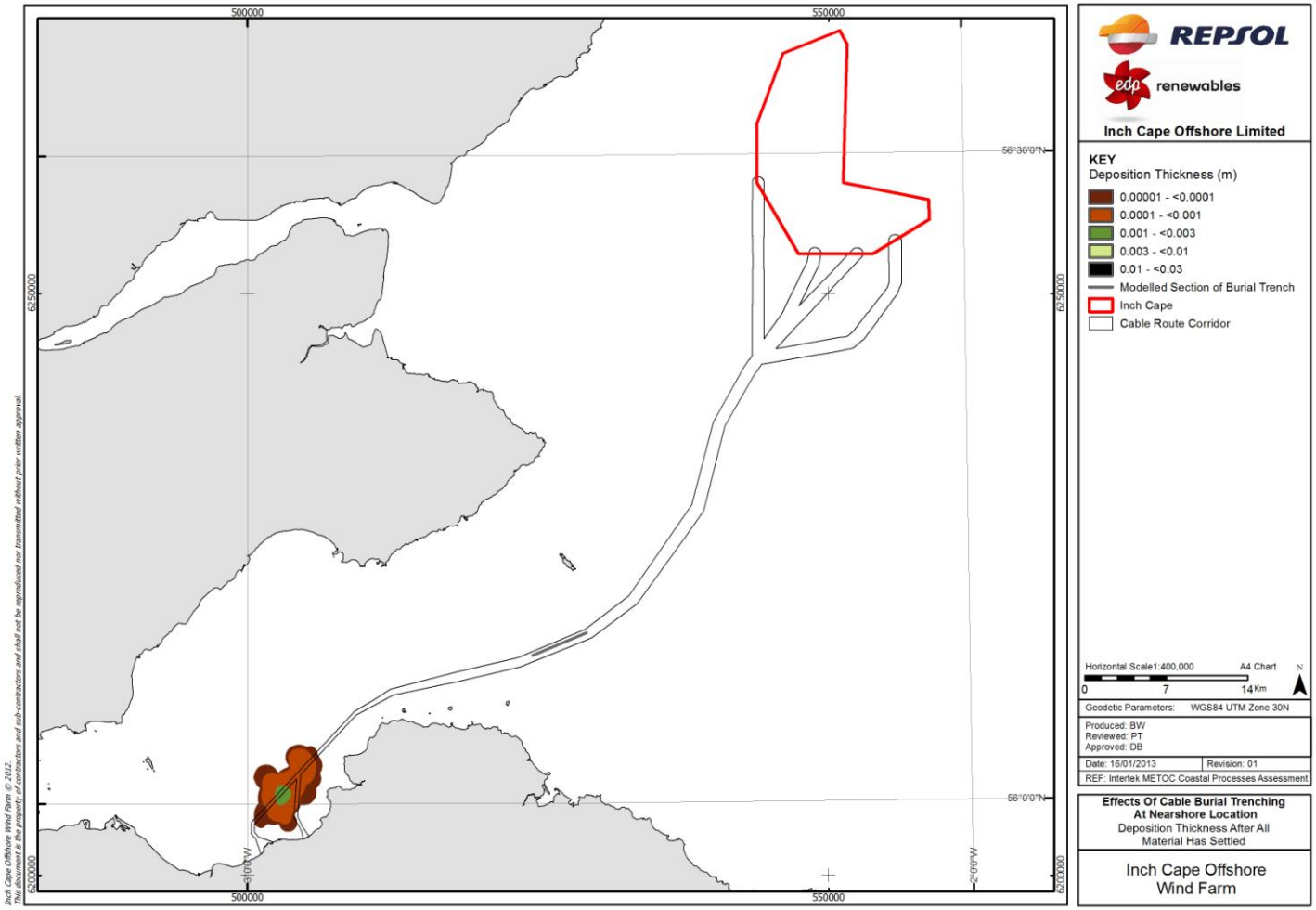
10A.7.80: Suspended sediment concentration due to cable trenching – nearshore area: 2 hours after cessation of trenching



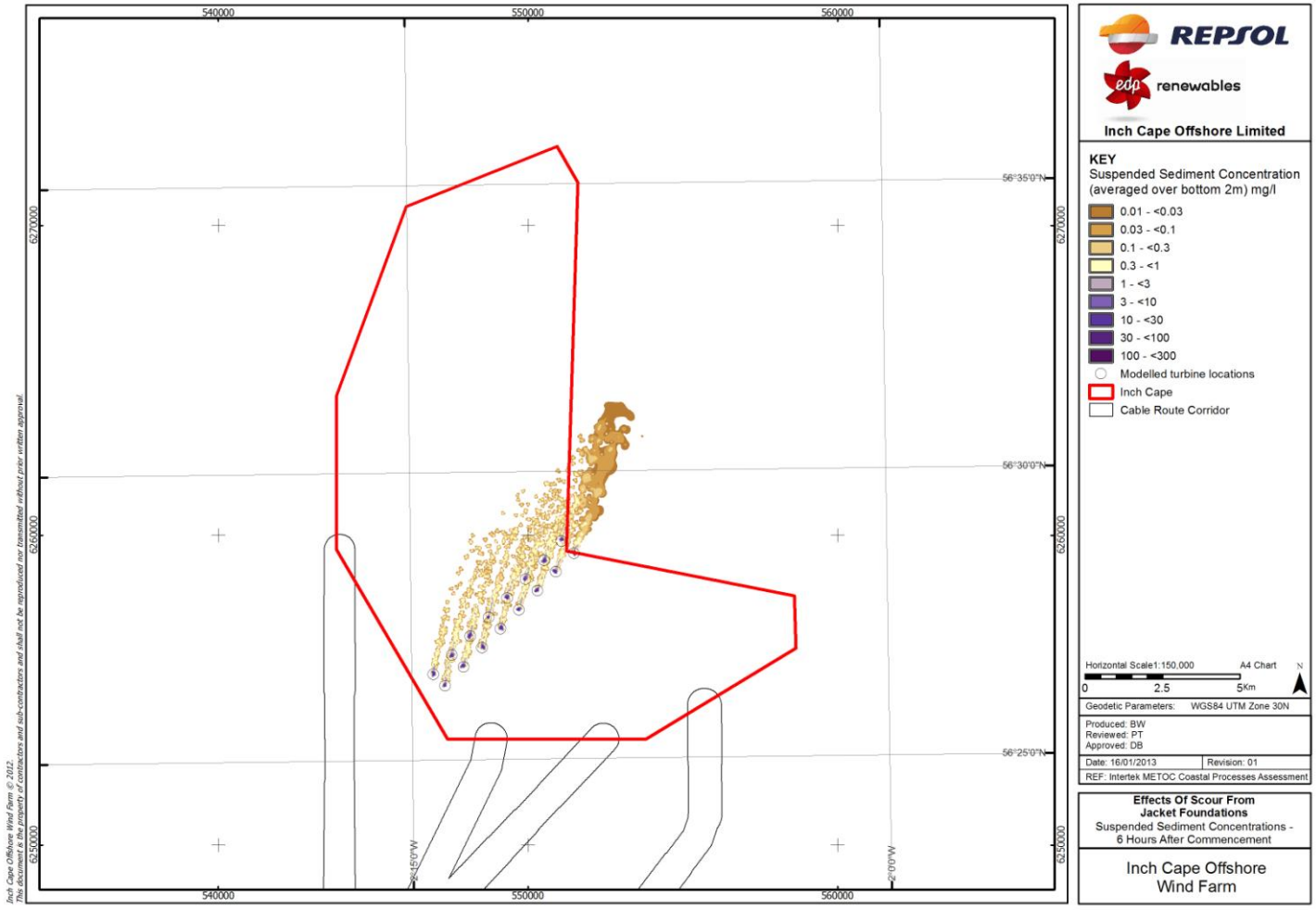
10A.7.81: Suspended sediment concentration due to cable trenching – nearshore area: 4 hours after cessation of trenching



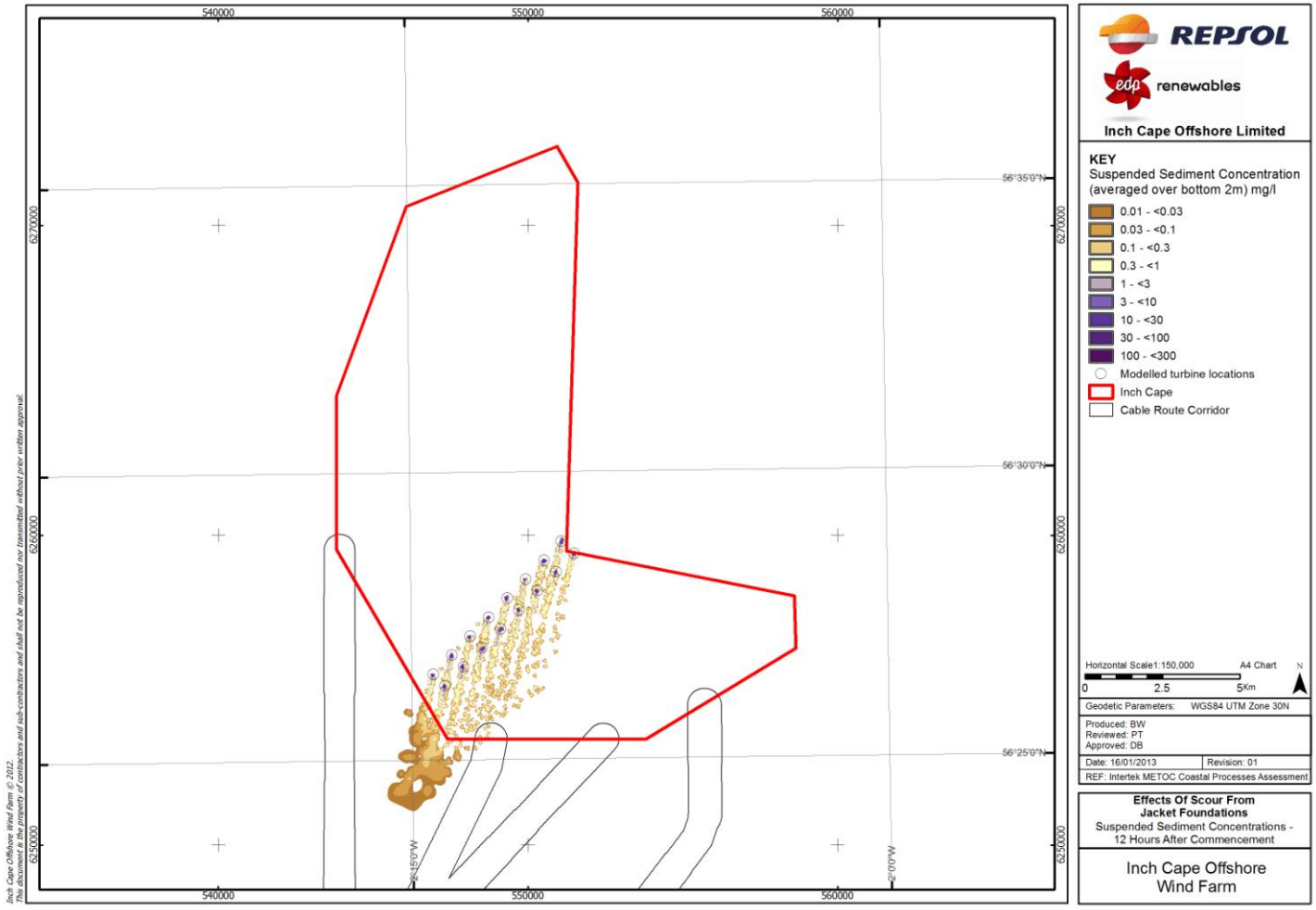
10A.7.82: Deposition thickness due to cable trenching – nearshore area: after all disturbed material has settled



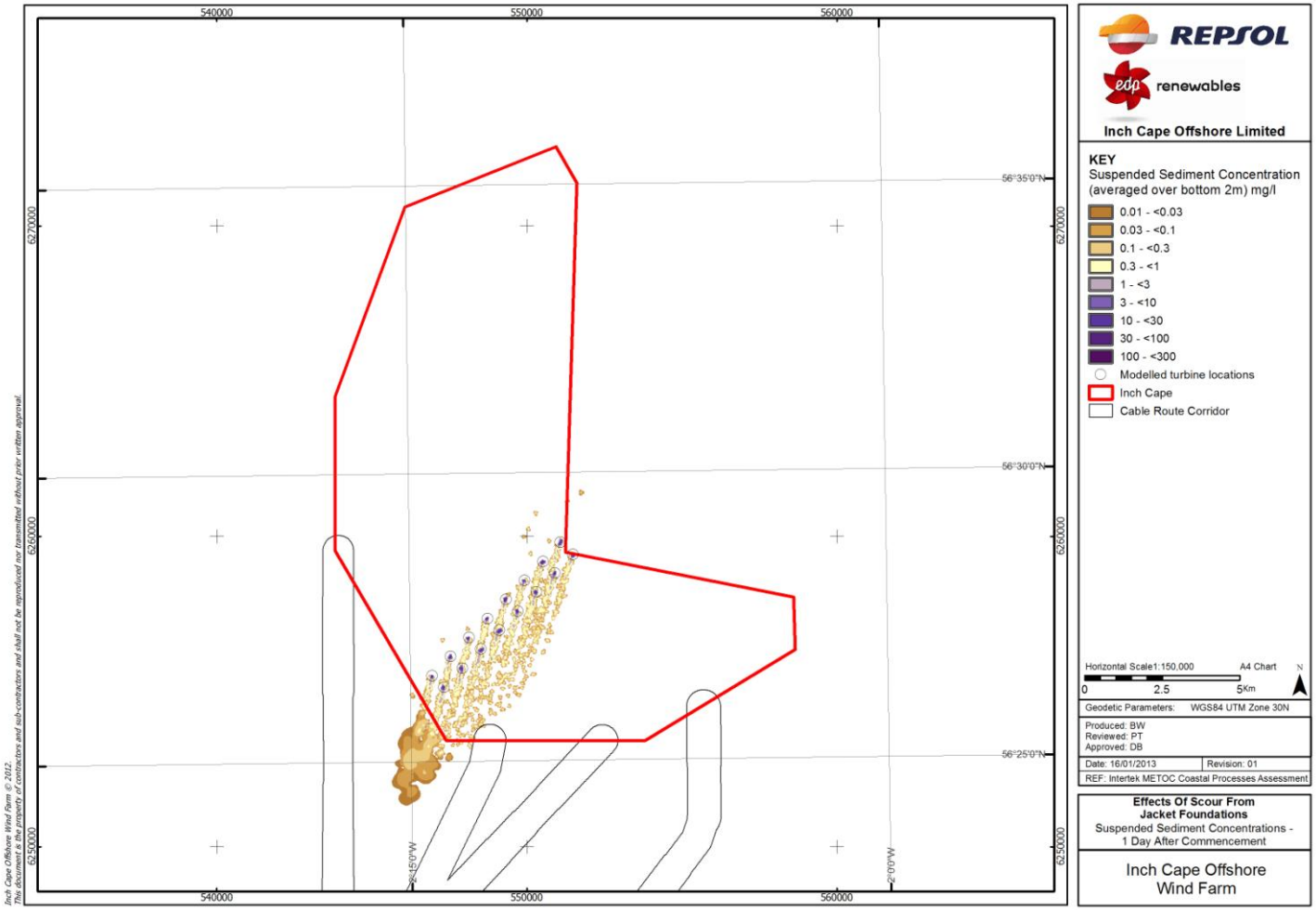
10A.7.83: Suspended sediment concentration due to scouring around turbine bases – 6 hours after 'commencement'



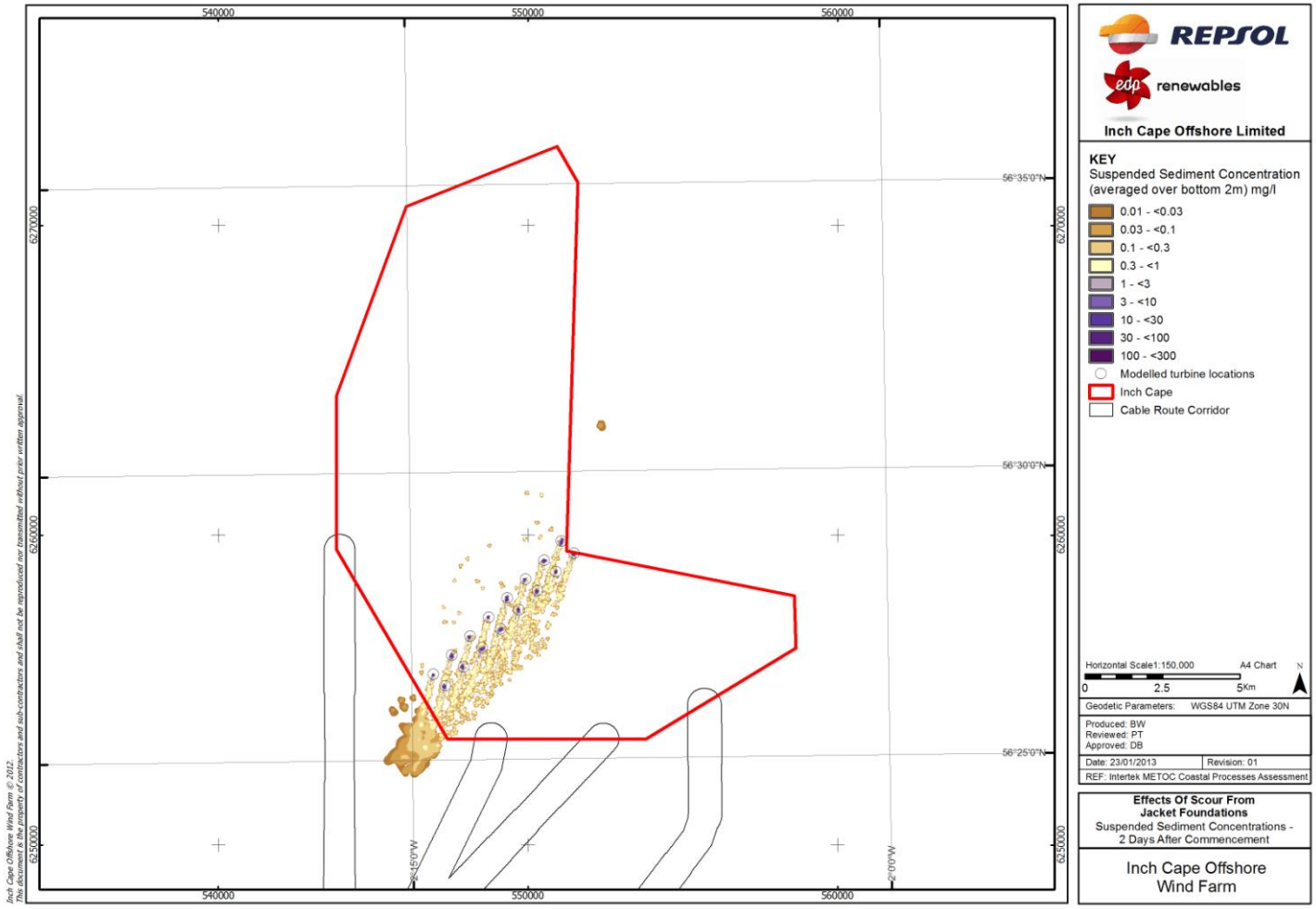
10A.7.84: Suspended sediment concentration due to scouring around turbine bases – 12 hours after 'commencement'



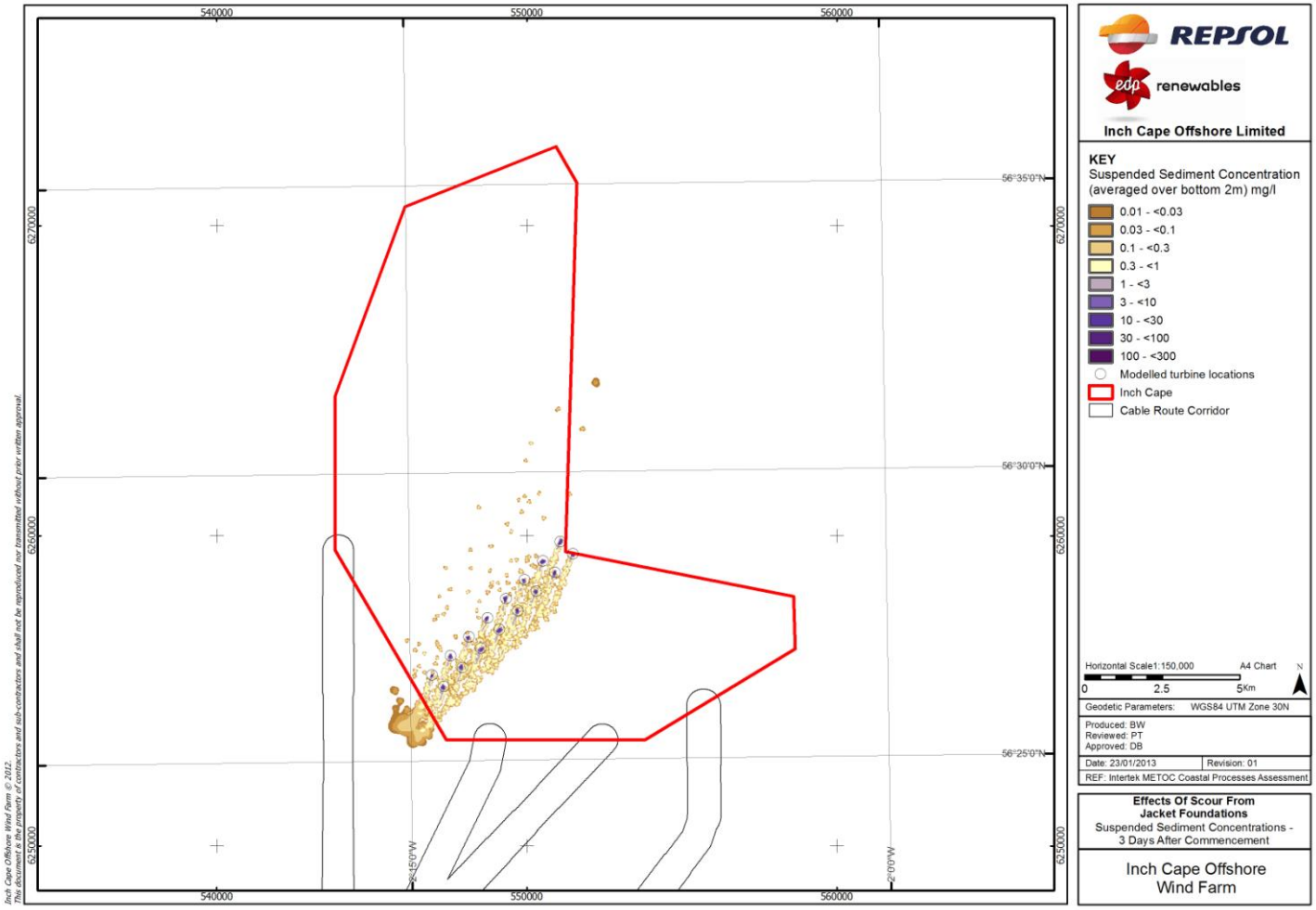
10A.7.85: Suspended sediment concentration due to scouring around turbine bases – 1 day after 'commencement'



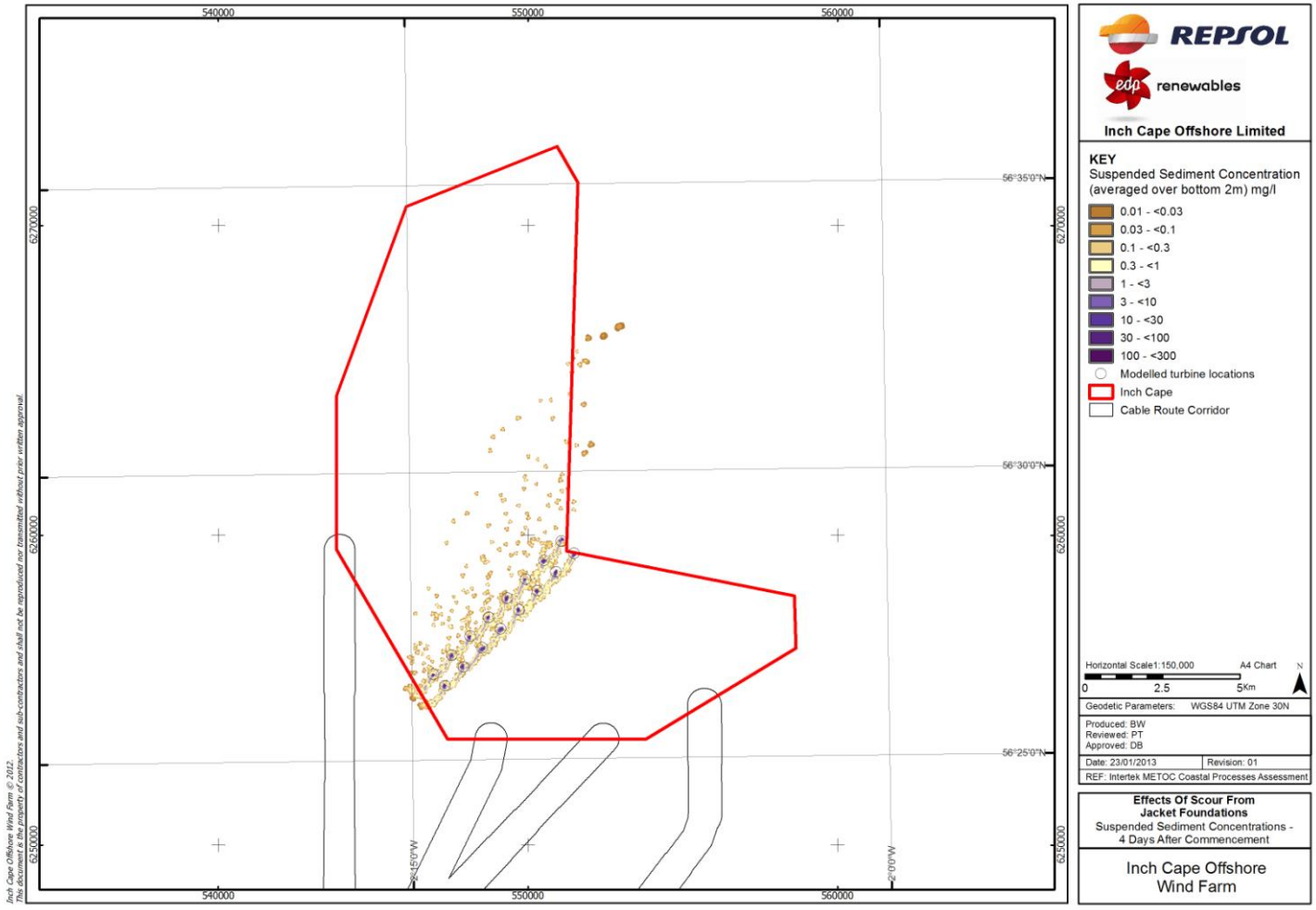
10A.7.86: Suspended sediment concentration due to scouring around turbine bases – 2 days after 'commencement'



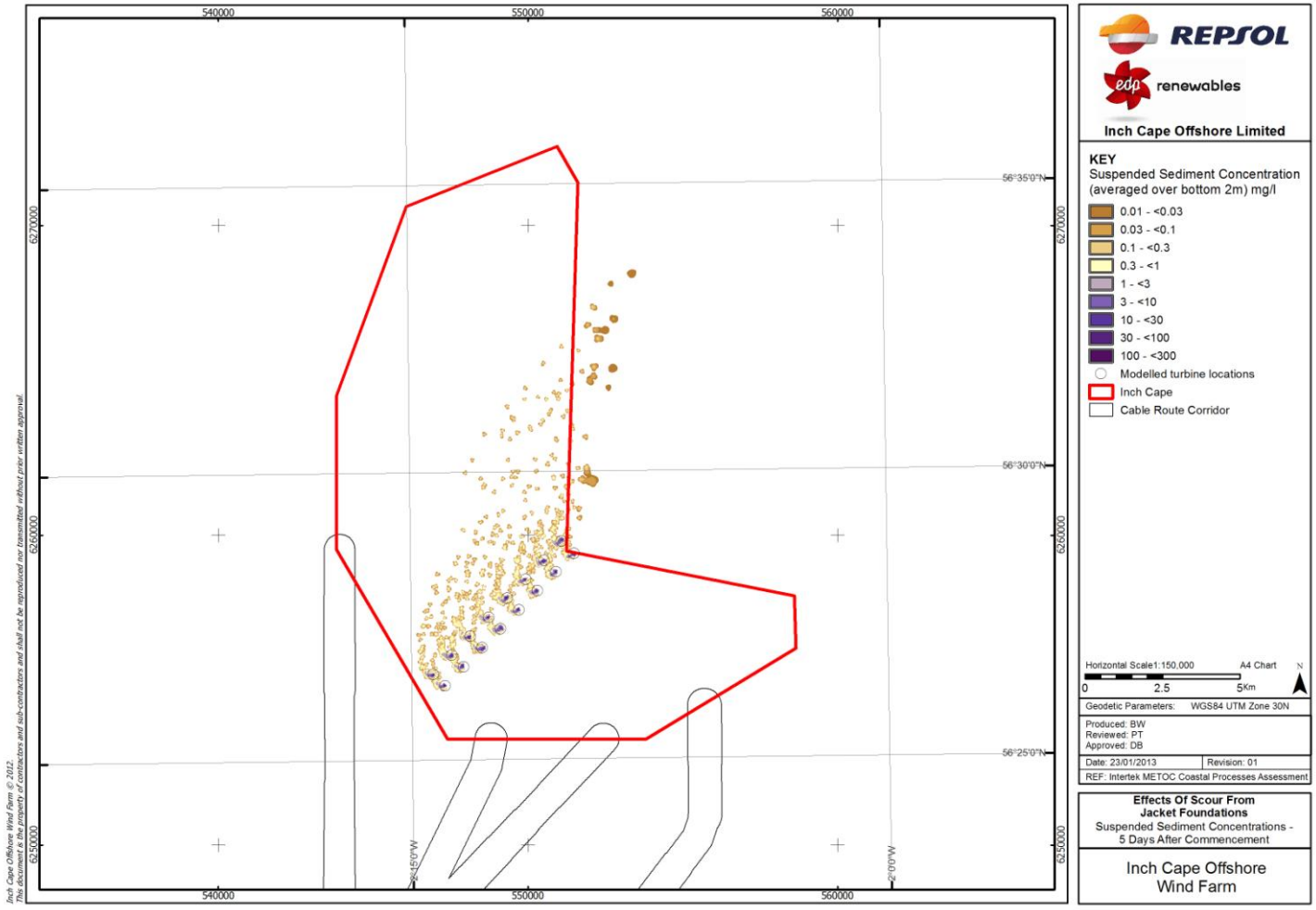
10A.7.87: Suspended sediment concentration due to scouring around turbine bases – 3 days after 'commencement'



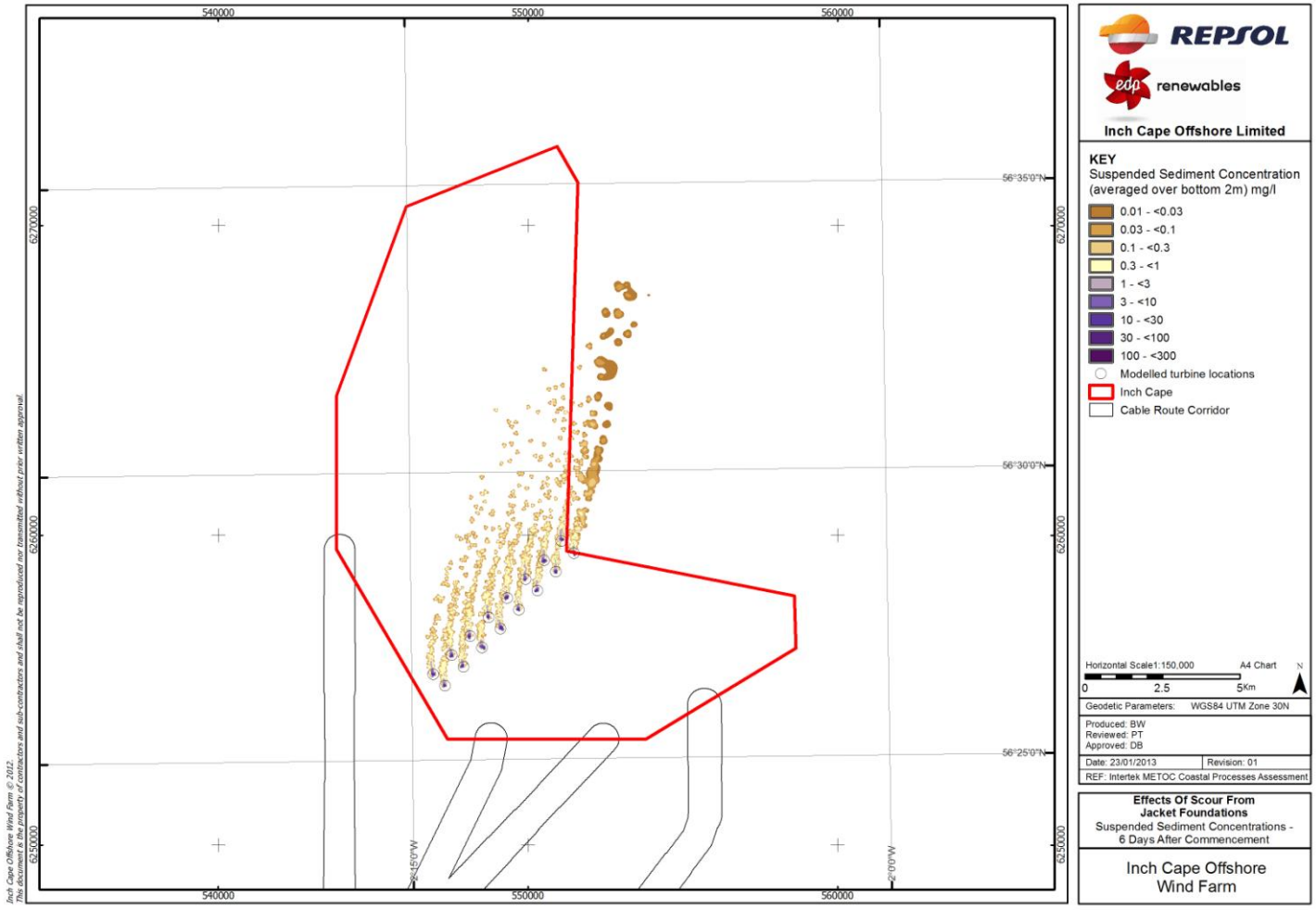
10A.7.88: Suspended sediment concentration due to scouring around turbine bases – 4 days after 'commencement'



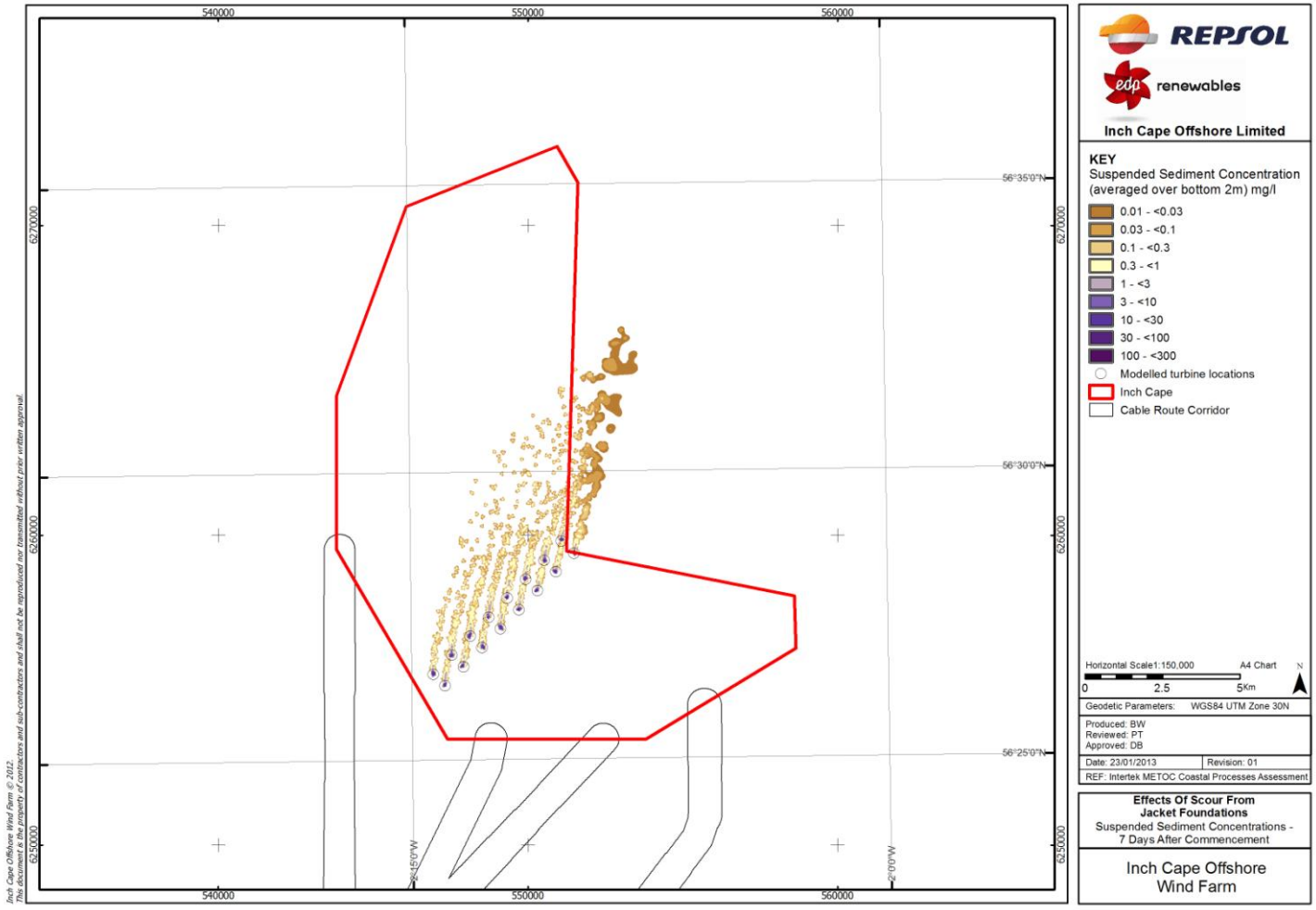
10A.7.89: Suspended sediment concentration due to scouring around turbine bases – 5 days after 'commencement'



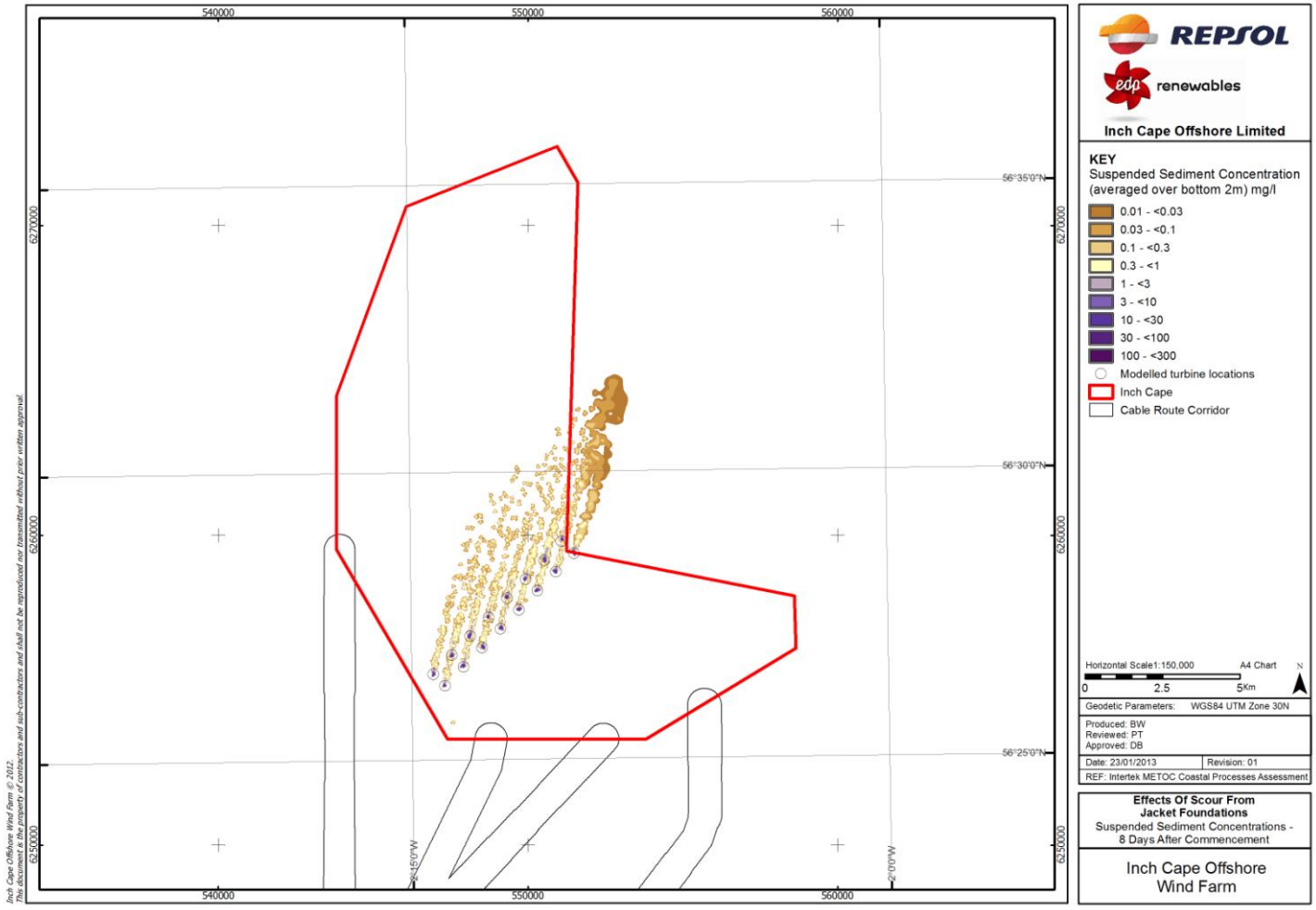
10A.7.90: Suspended sediment concentration due to scouring around turbine bases – 6 days after 'commencement'



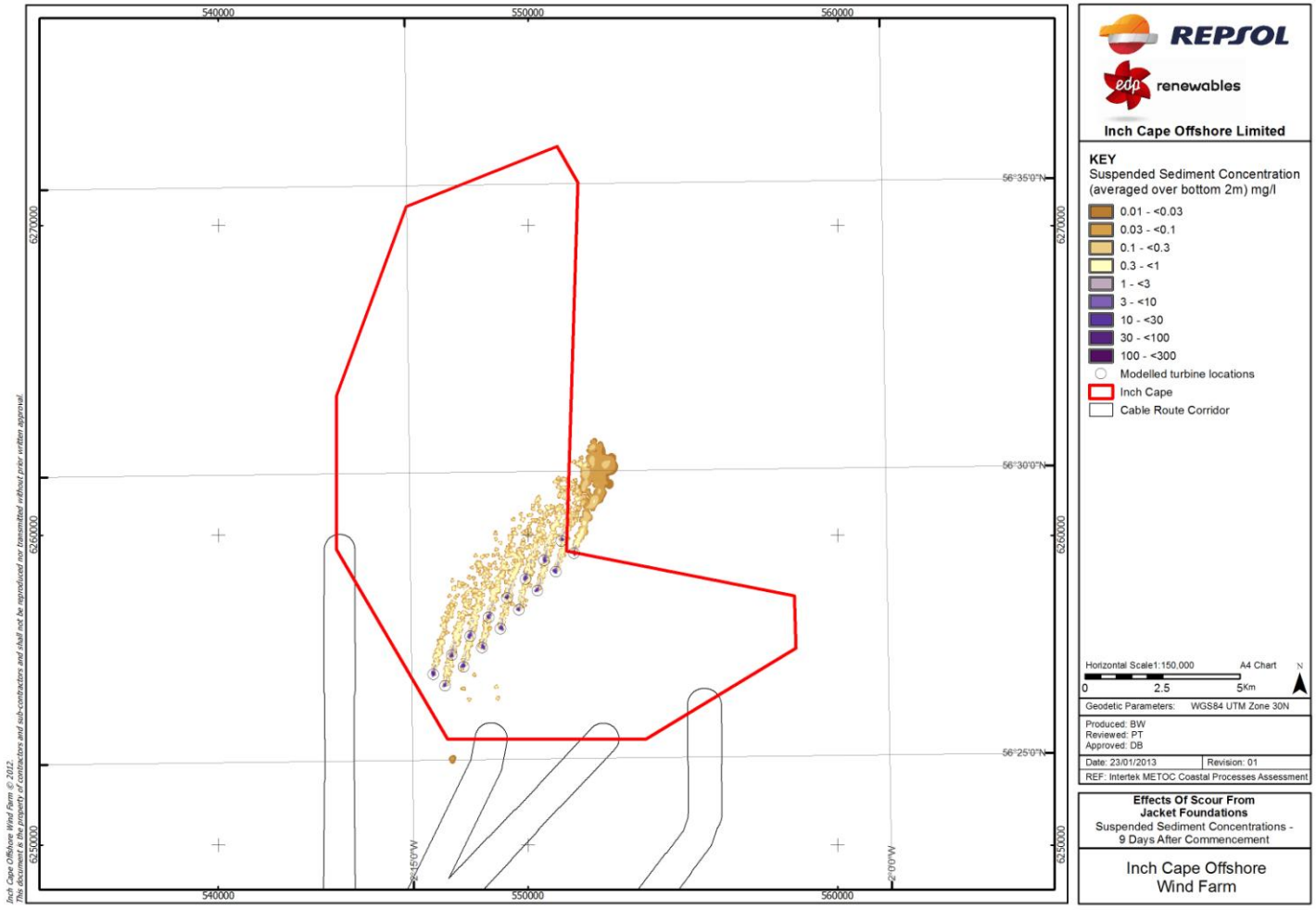
10A.7.91: Suspended sediment concentration due to scouring around turbine bases – 7 days after 'commencement'



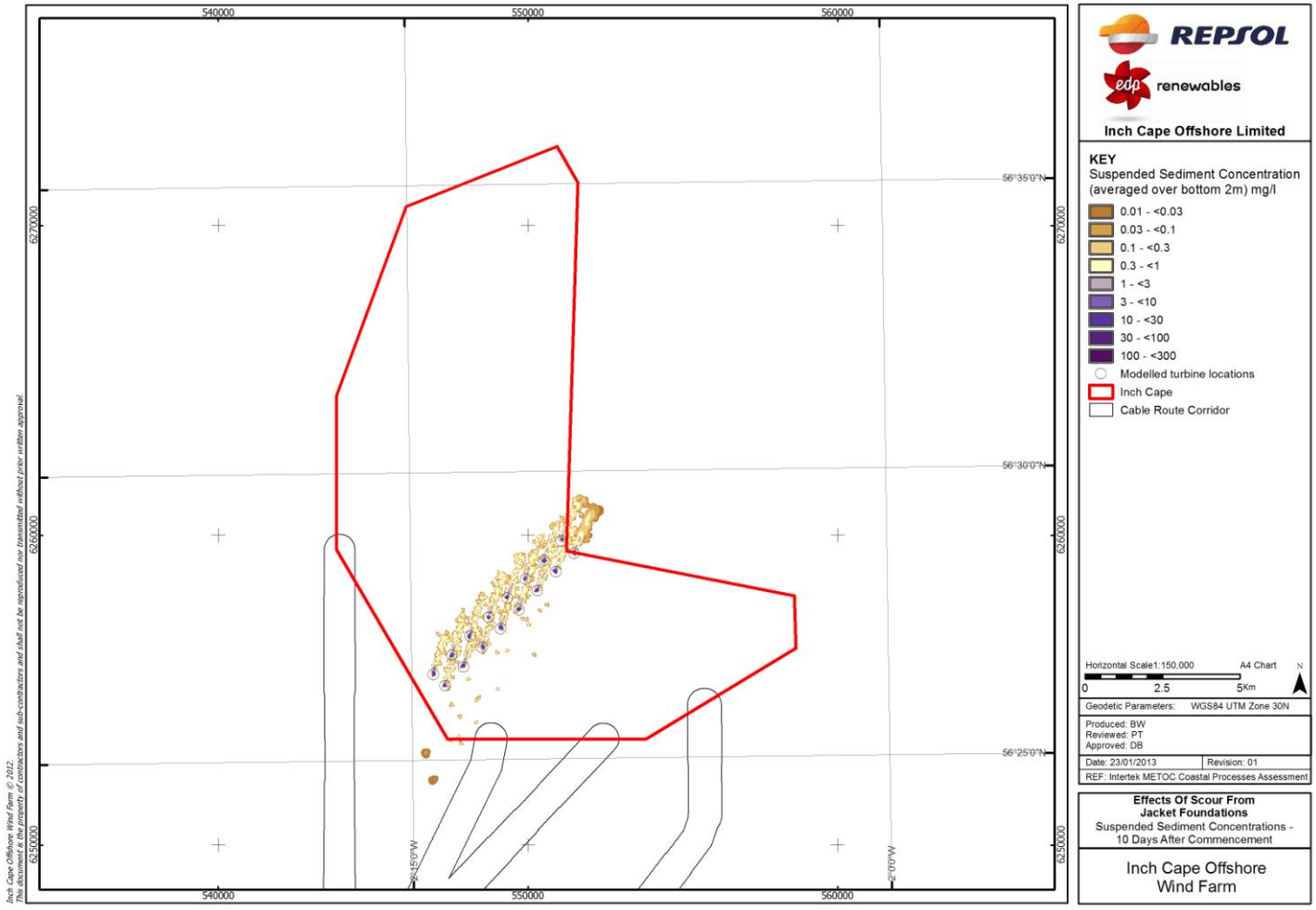
10A.7.92: Suspended sediment concentration due to scouring around turbine bases – 8 days after 'commencement'



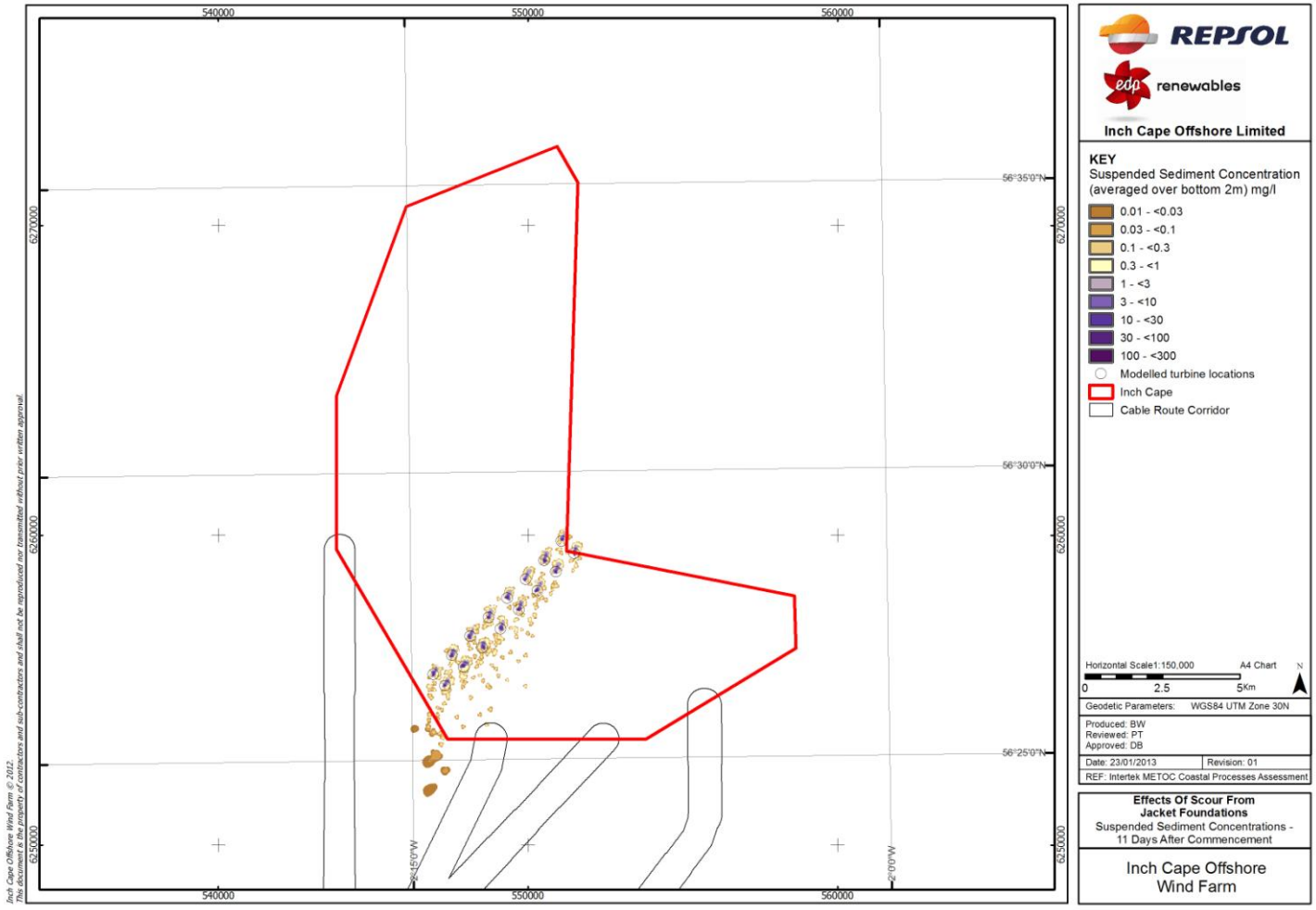
10A.7.93: Suspended sediment concentration due to scouring around turbine bases – 9 days after 'commencement'



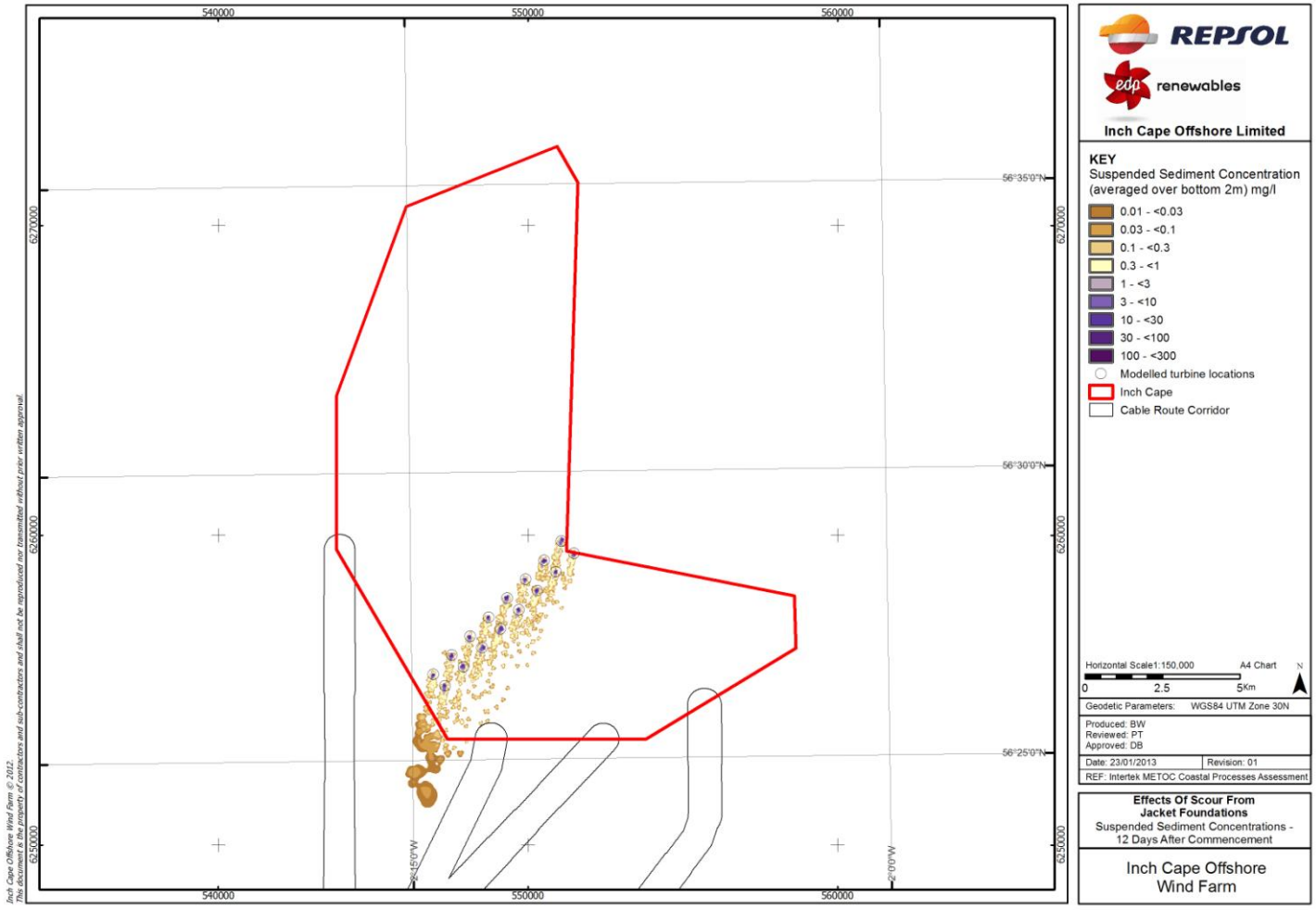
10A.7.94: Suspended sediment concentration due to scouring around turbine bases – 10 days after 'commencement'



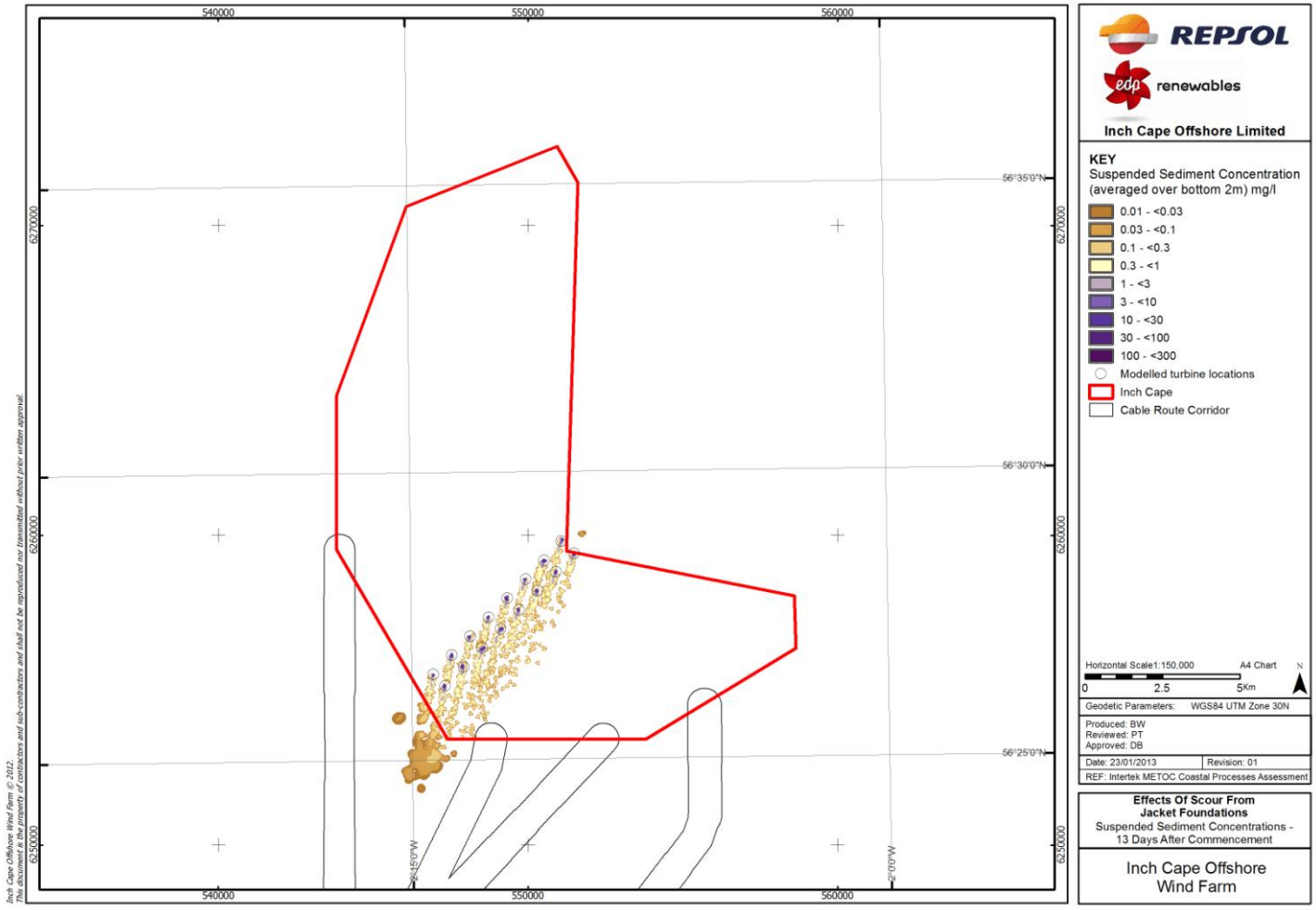
10A.7.95: Suspended sediment concentration due to scouring around turbine bases – 11 days after 'commencement'



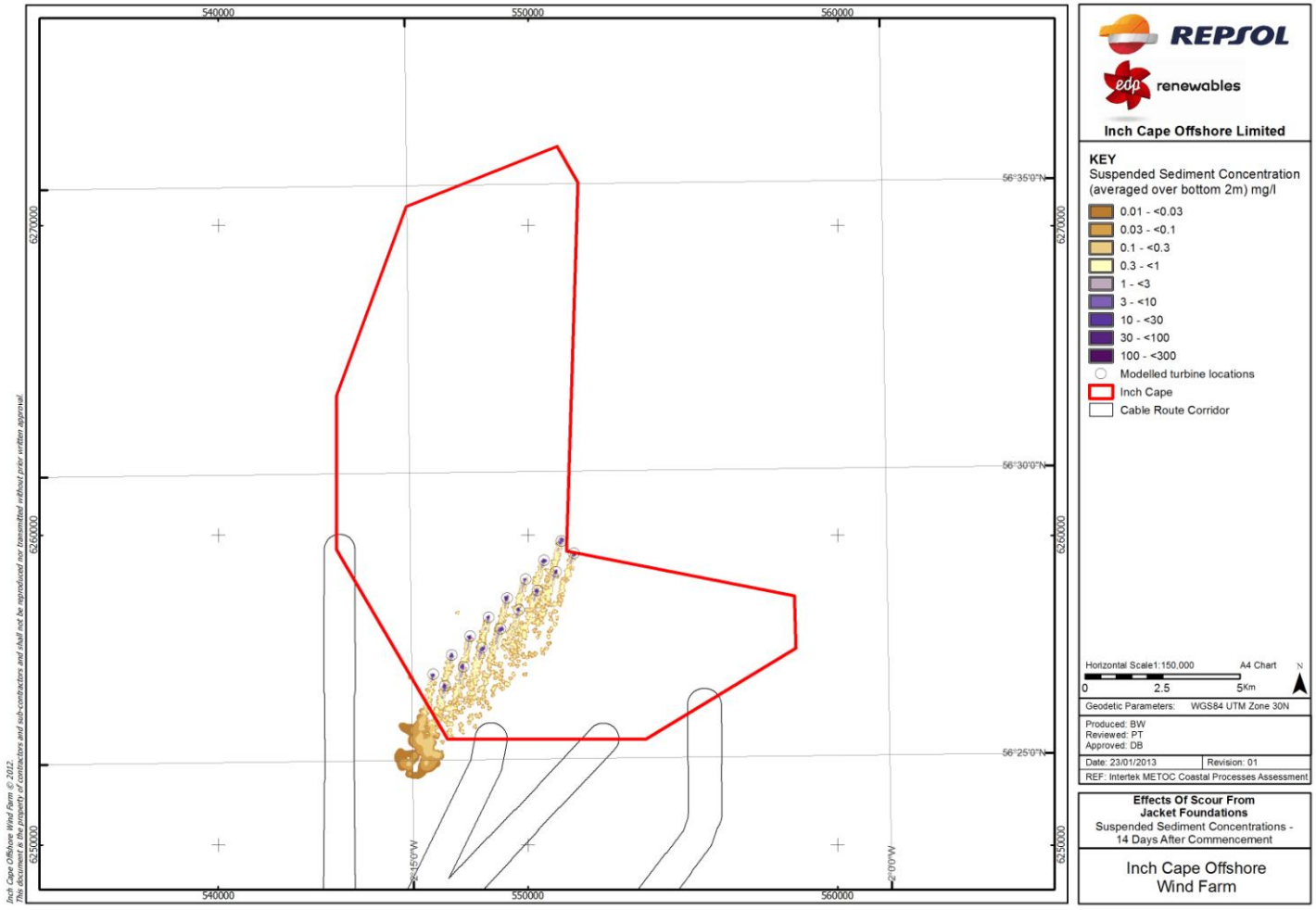
10A.7.96: Suspended sediment concentration due to scouring around turbine bases – 12 days after 'commencement'



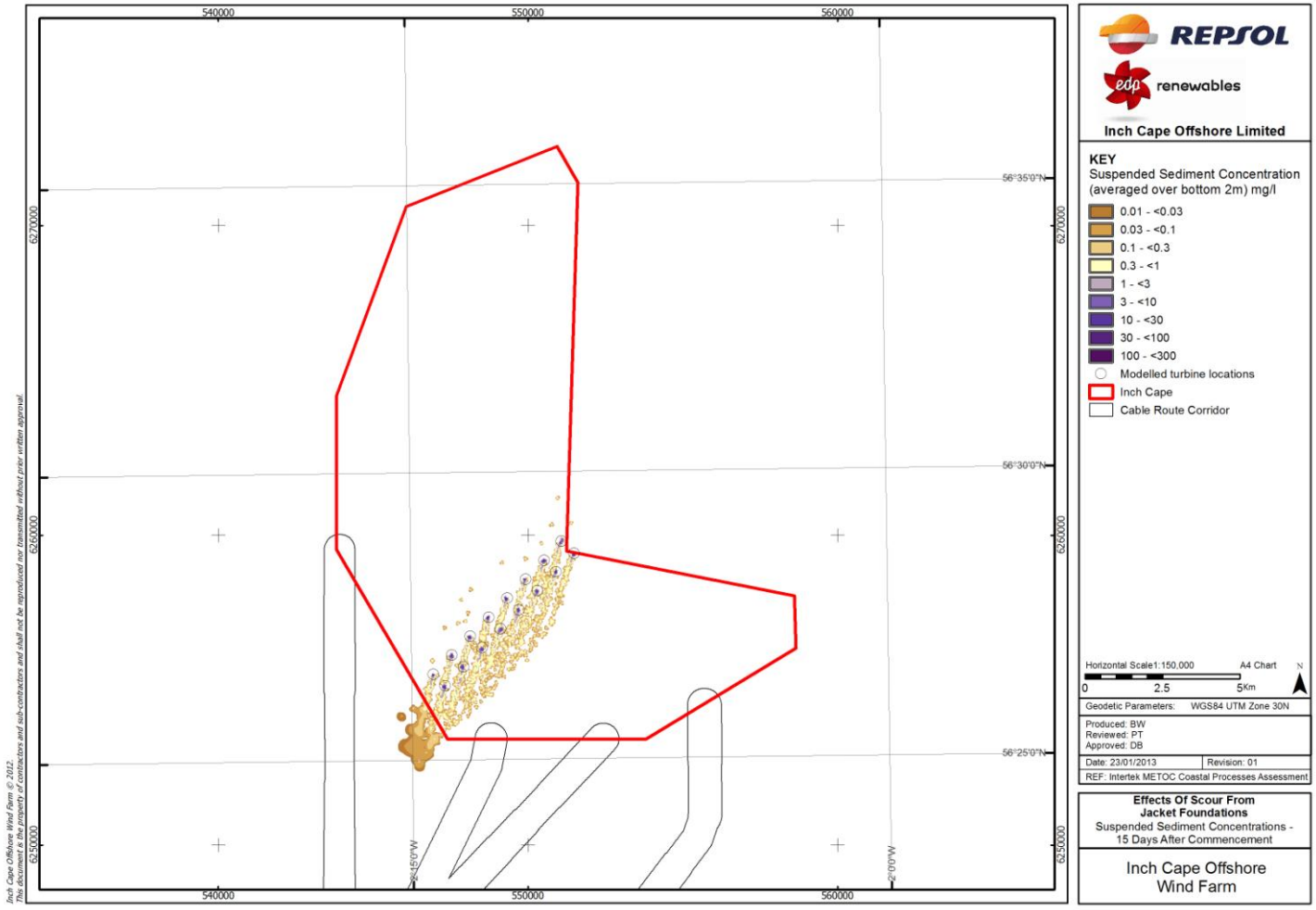
10A.7.97: Suspended sediment concentration due to scouring around turbine bases – 13 days after 'commencement'



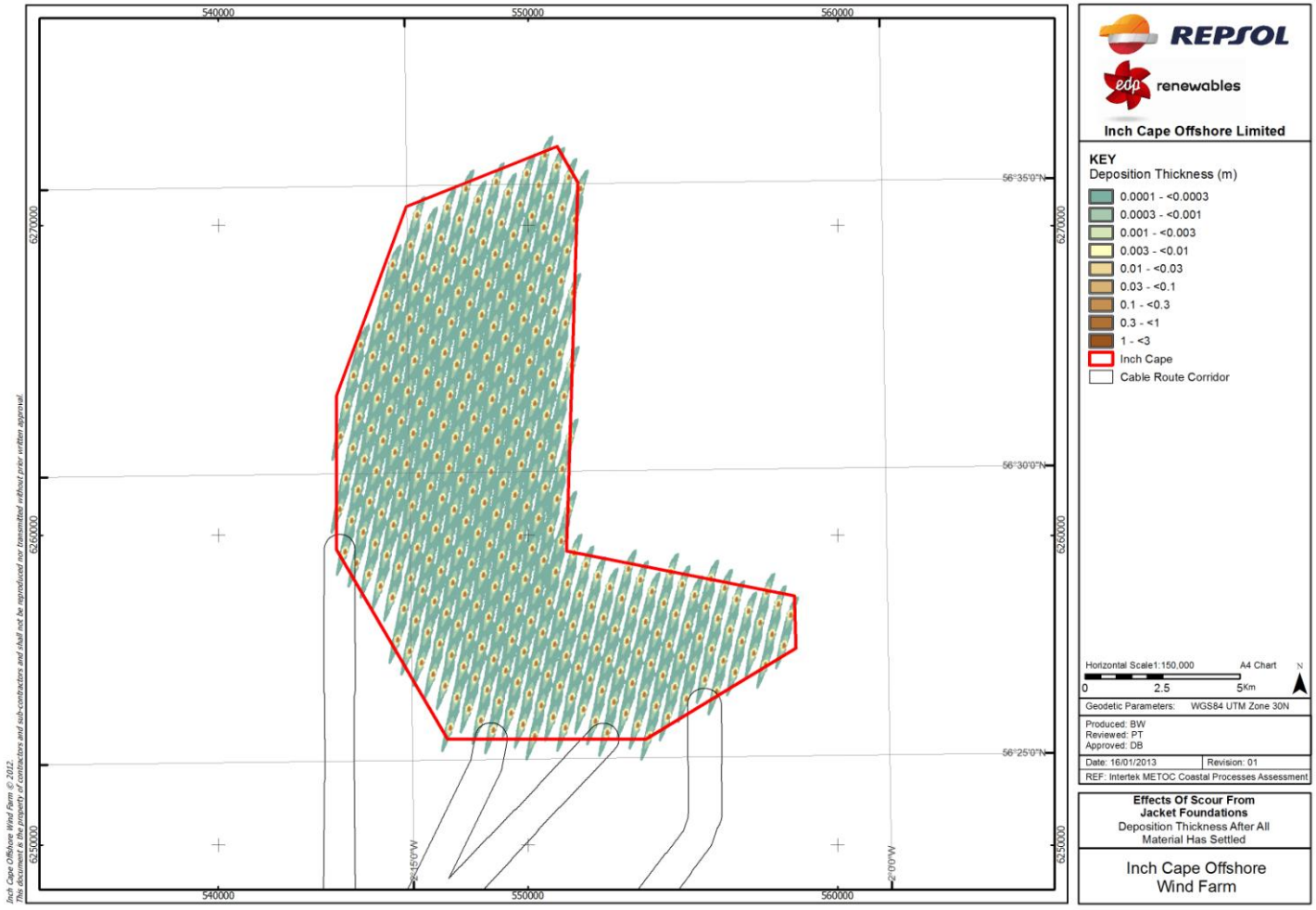
10A.7.98: Suspended sediment concentration due to scouring around turbine bases – 14 days after 'commencement'



10A.7.99: Suspended sediment concentration due to scouring around turbine bases – 15 days after 'commencement'

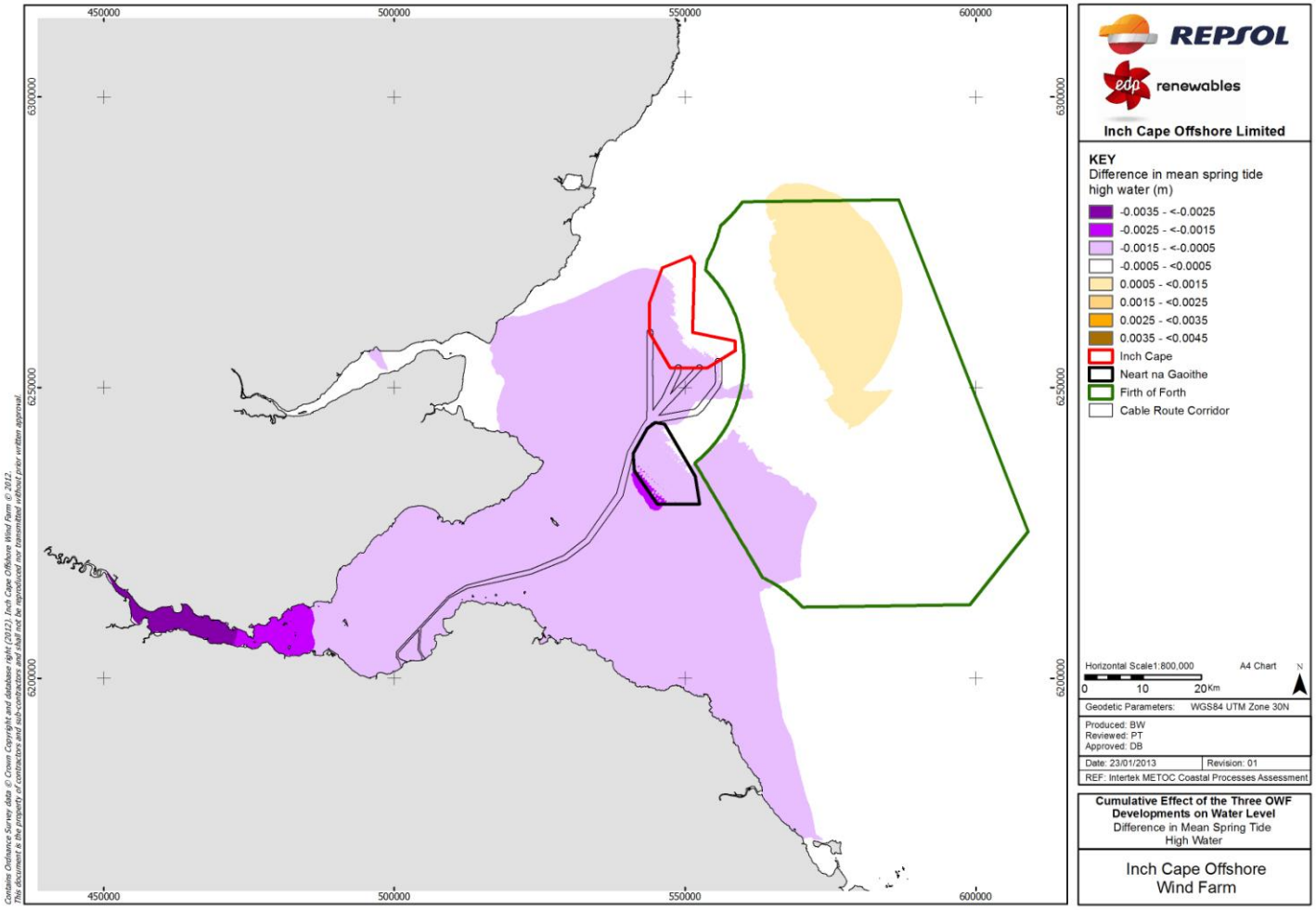


10A.7.100: Deposition thickness due to scouring around turbine bases – after all scoured material has settled

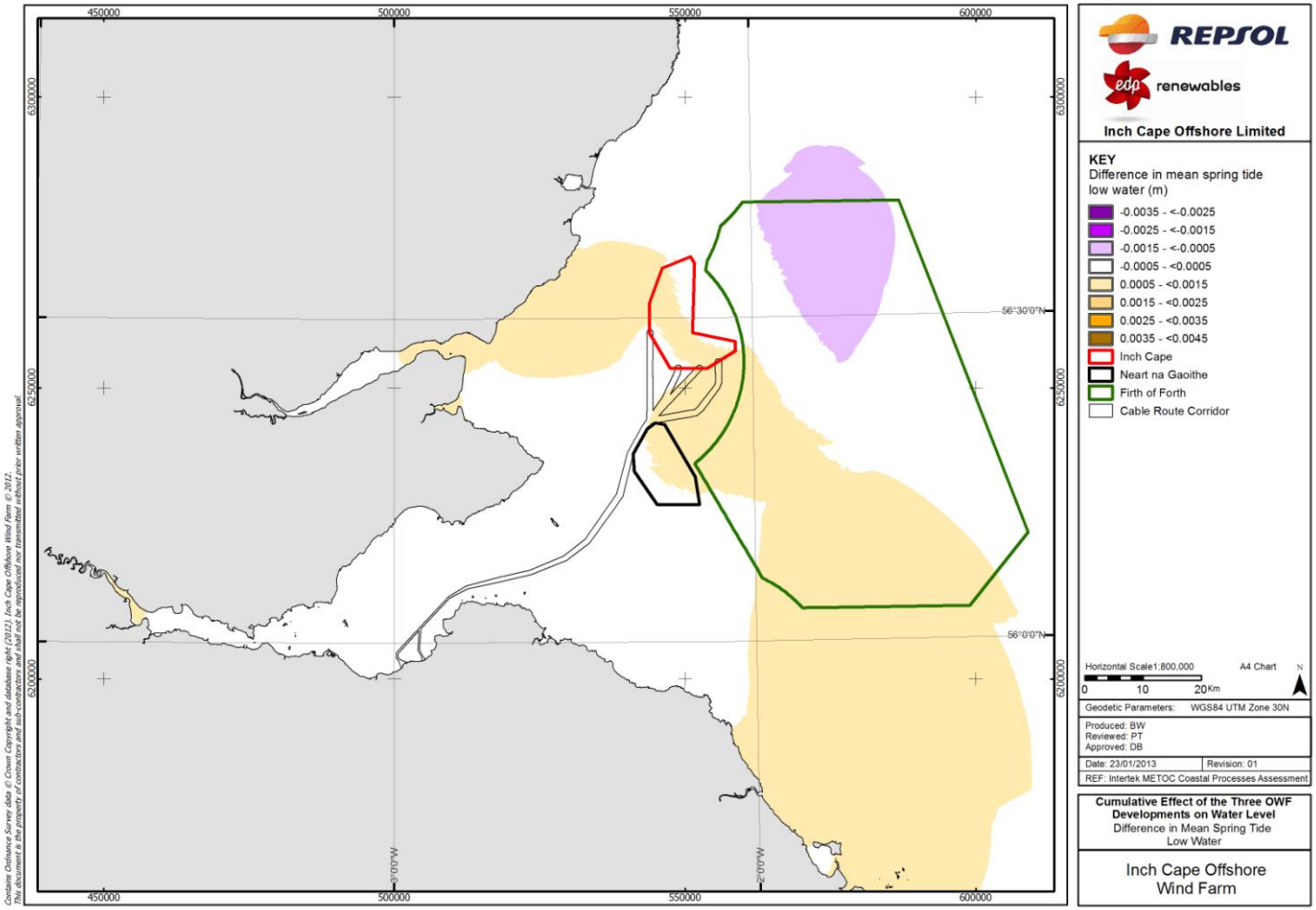


Cumulative effects from Inch Cape, Neart na Gaoithe, and Firth of Forth OWF Developments

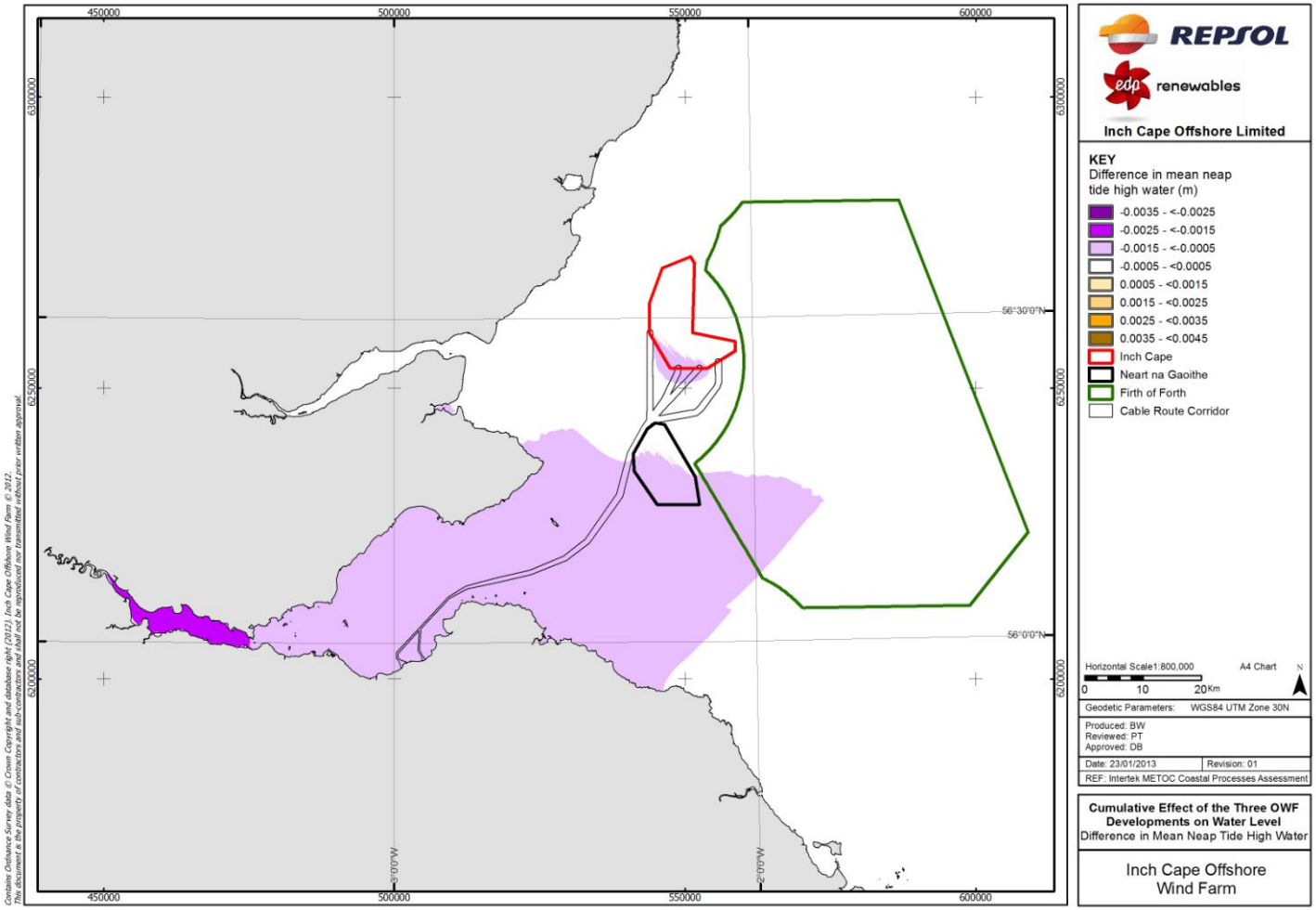
10A.7.101: Cumulative difference to mean spring tide high water level (m)



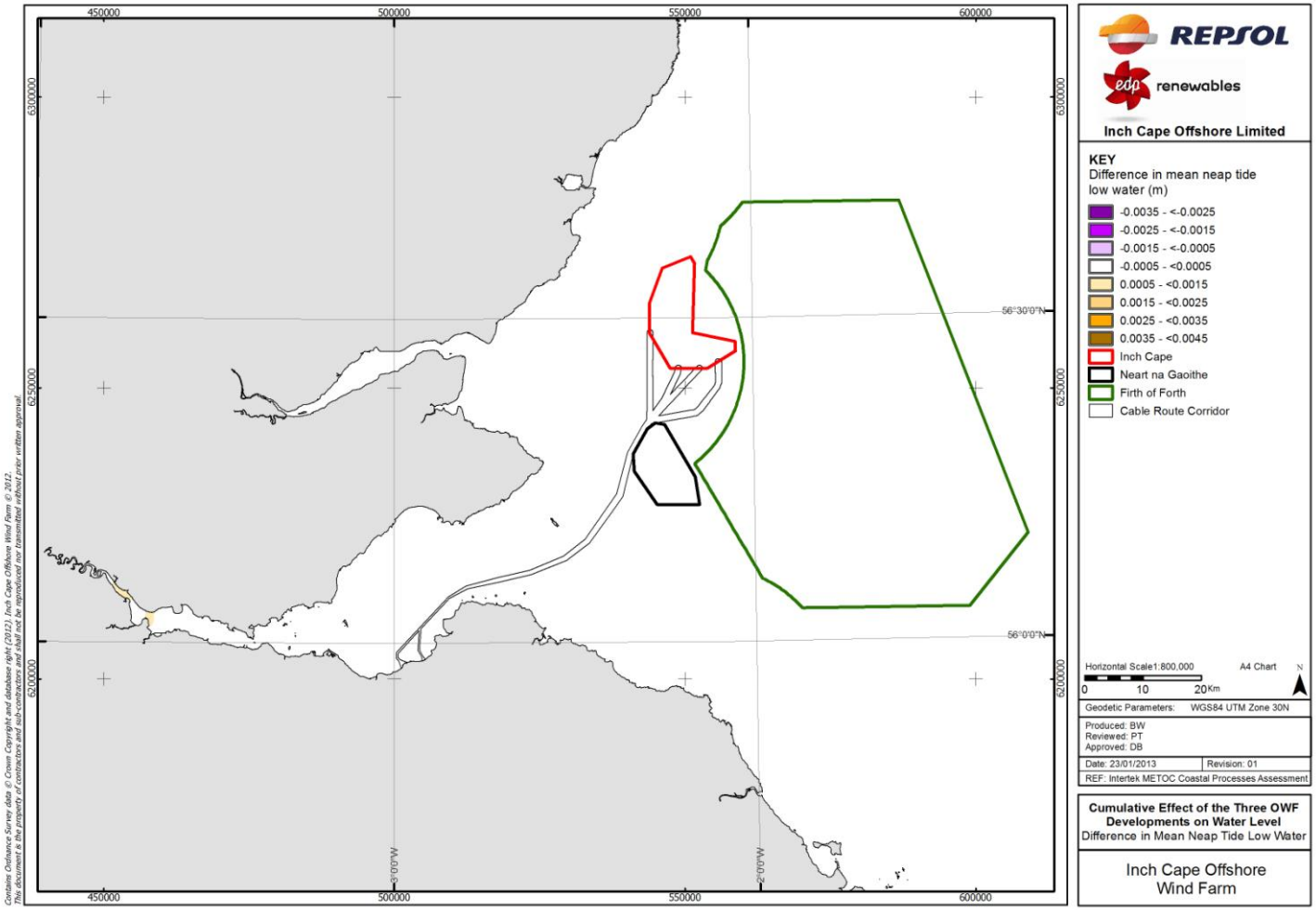
10A.7.102: Cumulative difference to mean spring tide low water level (m)



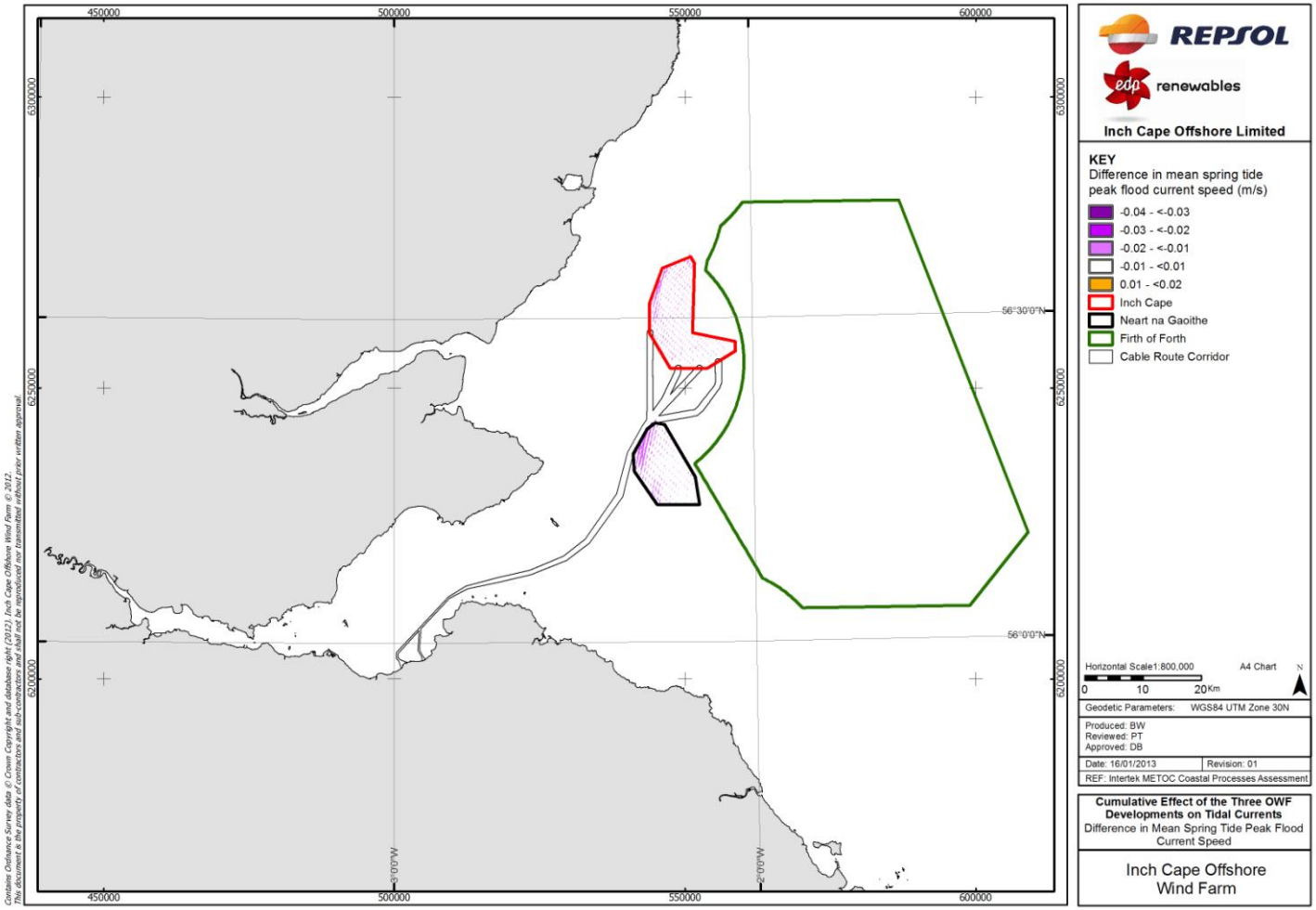
10A.7.103: Cumulative difference to mean neap tide high water level (m)



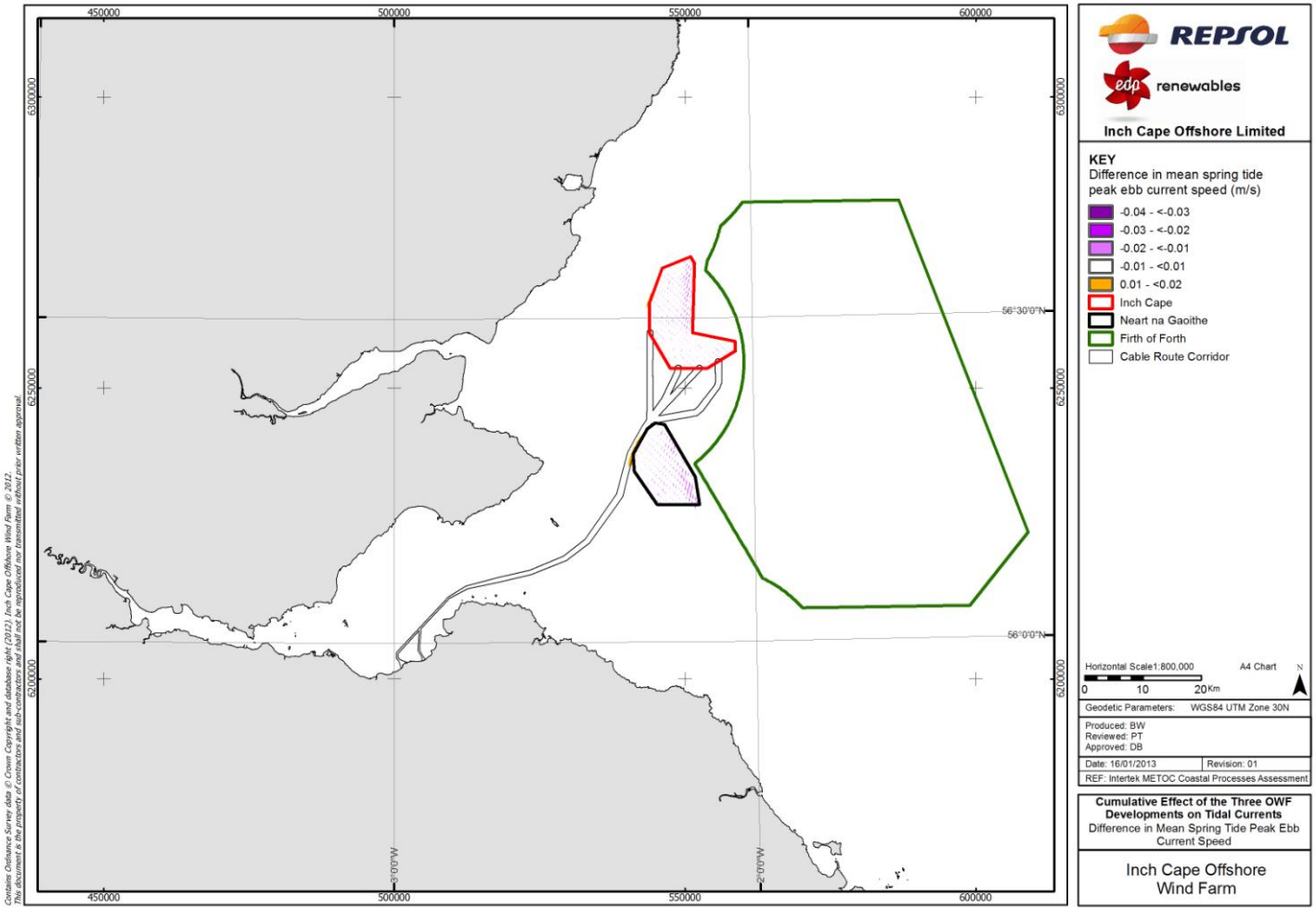
10A.7.104: Cumulative difference to mean neap tide low water level (m)



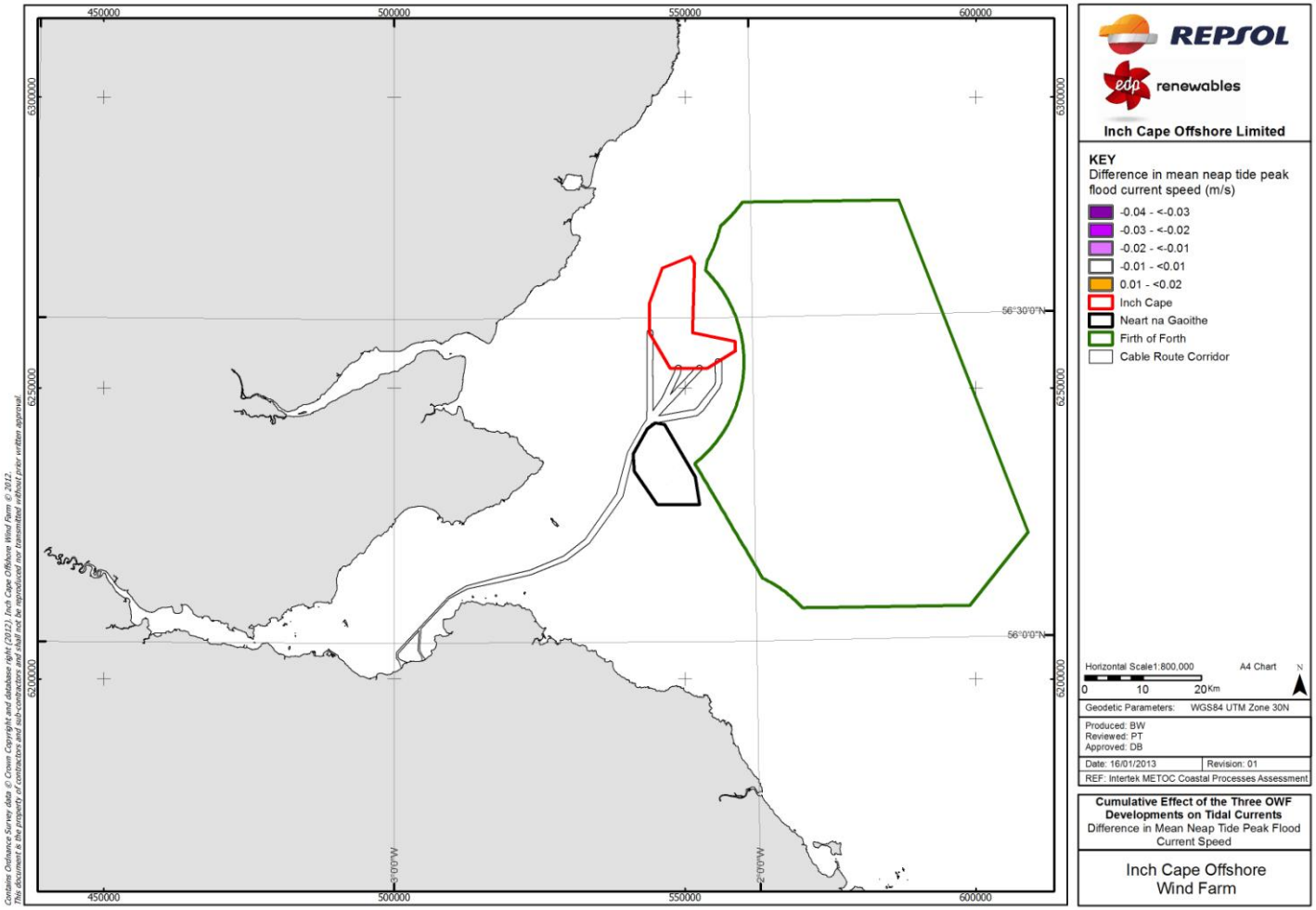
10A.7.105: Cumulative difference to mean spring tide peak flood current speed (m/s)



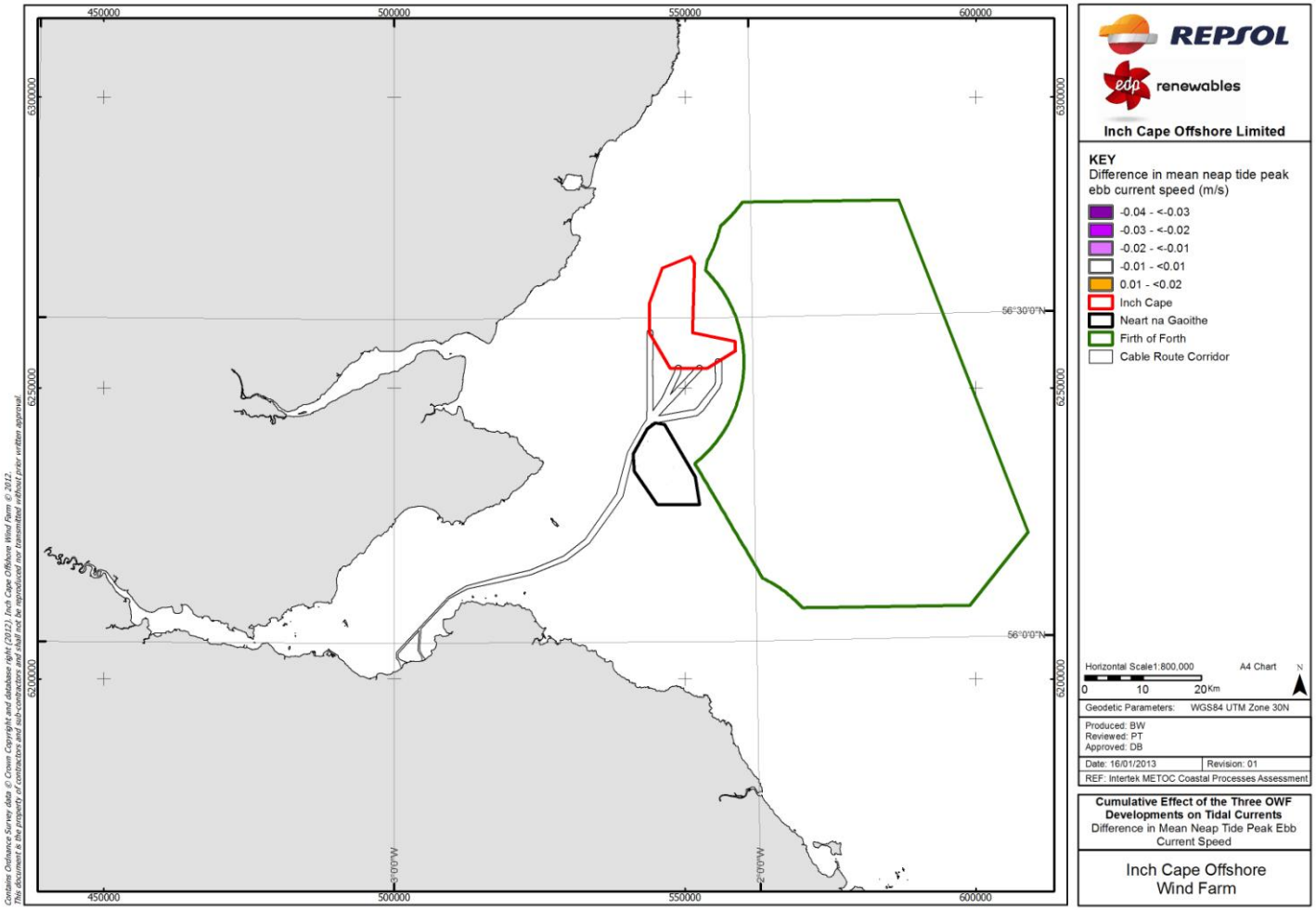
10A.7.106: Cumulative difference to mean spring tide peak ebb current speed (m/s)



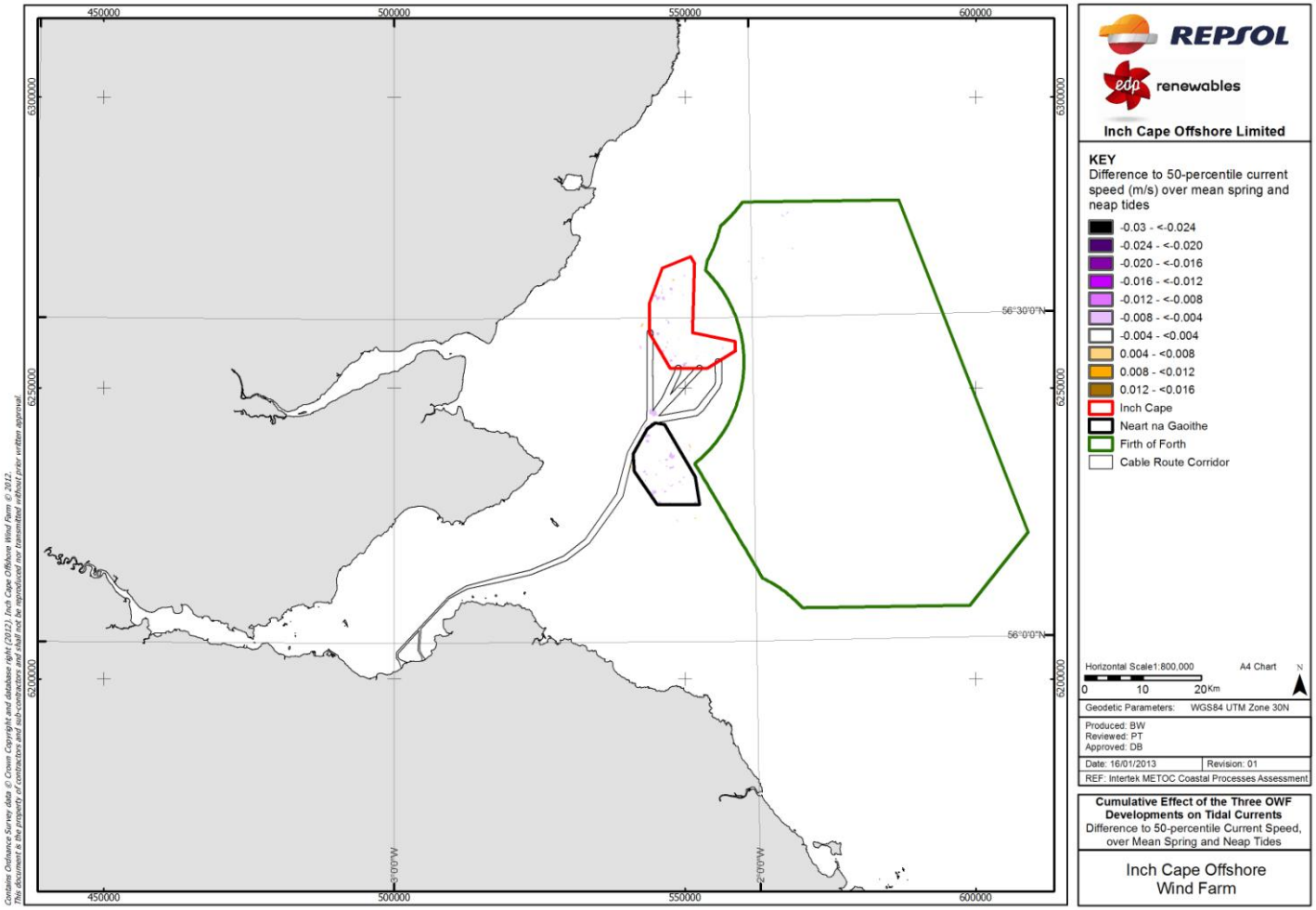
10A.7.107: Cumulative difference to mean neap tide peak flood current speed (m/s)



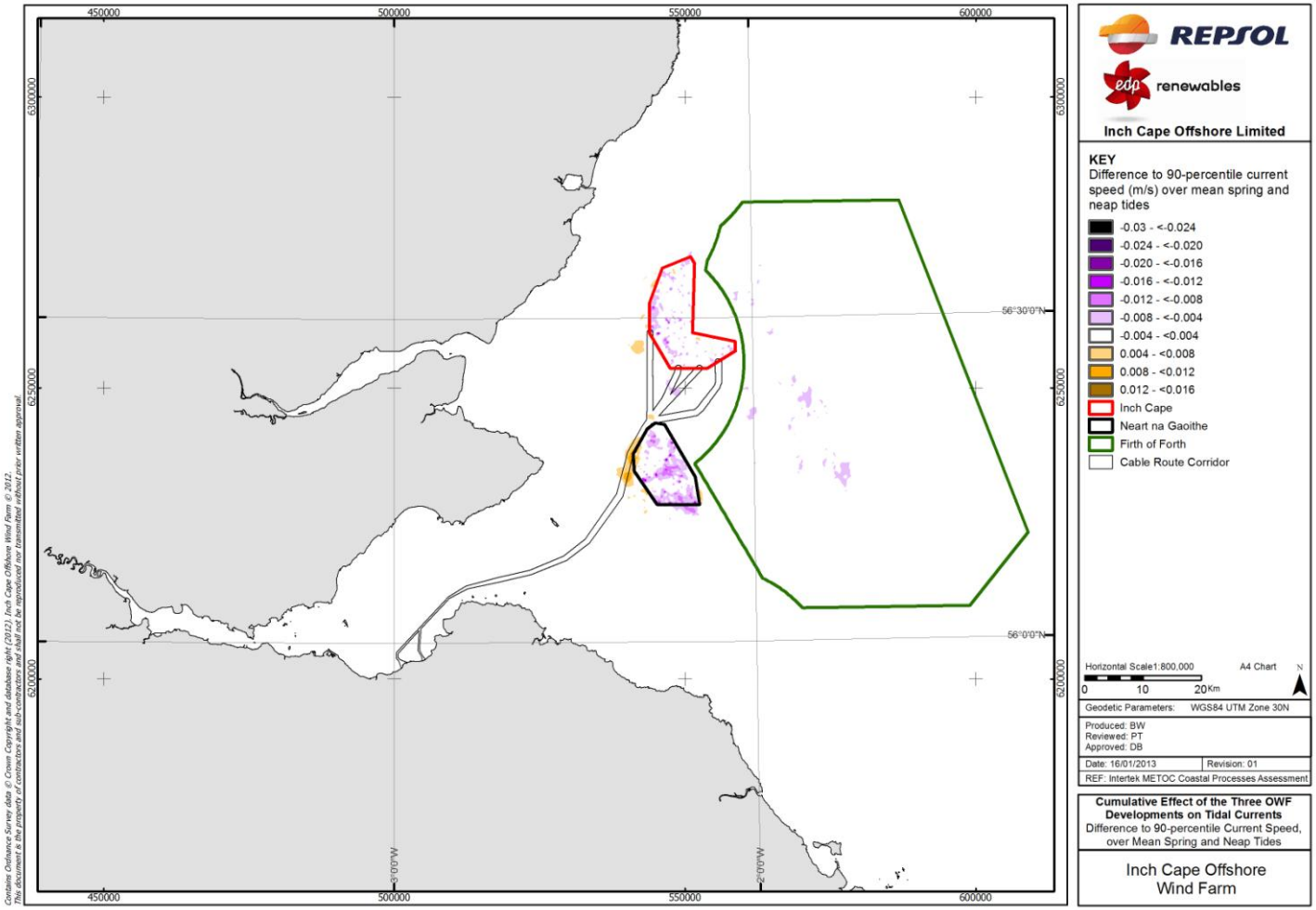
10A.7.108: Cumulative difference to mean neap tide peak ebb current speed (m/s)



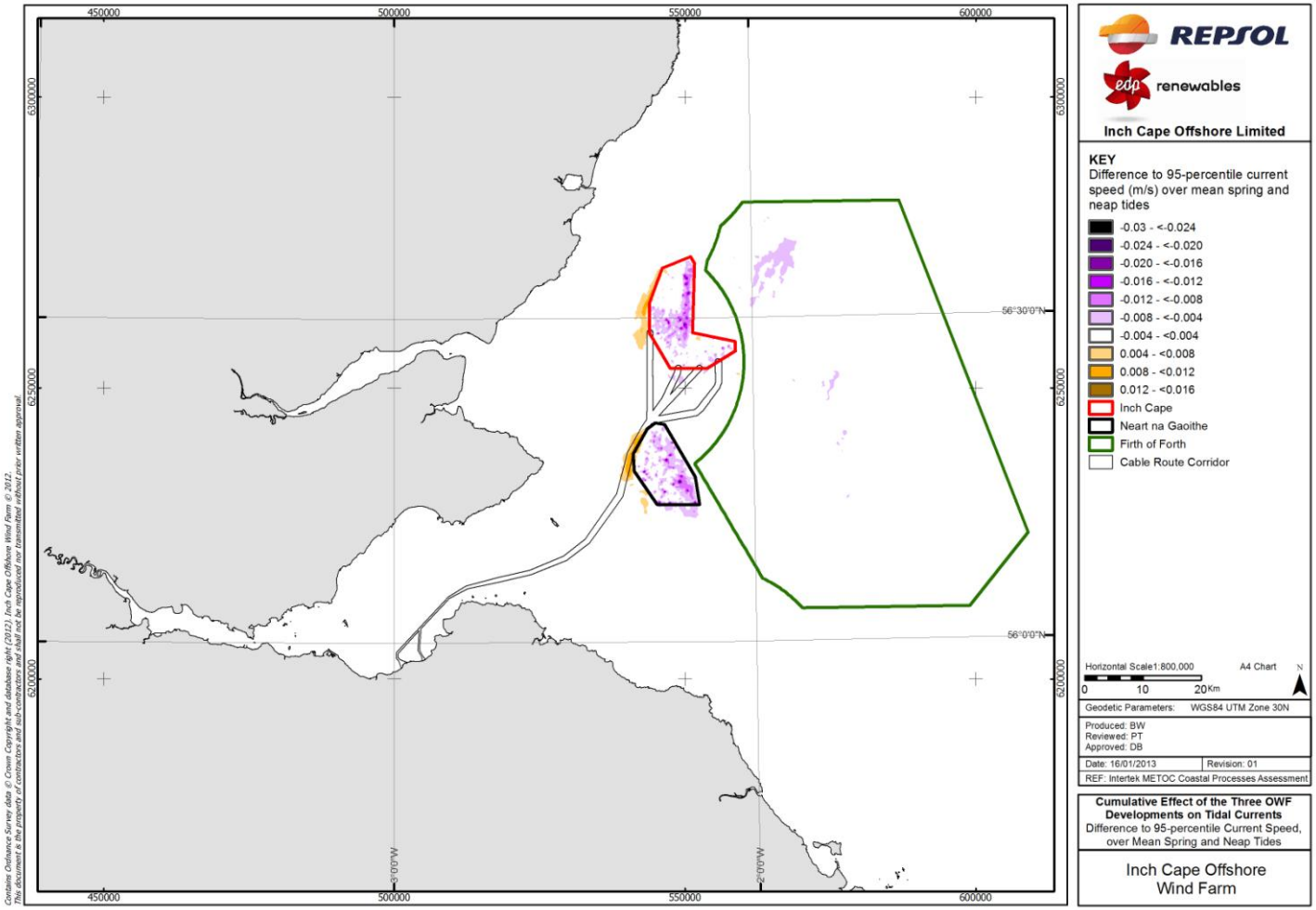
10A.7.109: Cumulative difference to 50-percentile current speed (m/s)



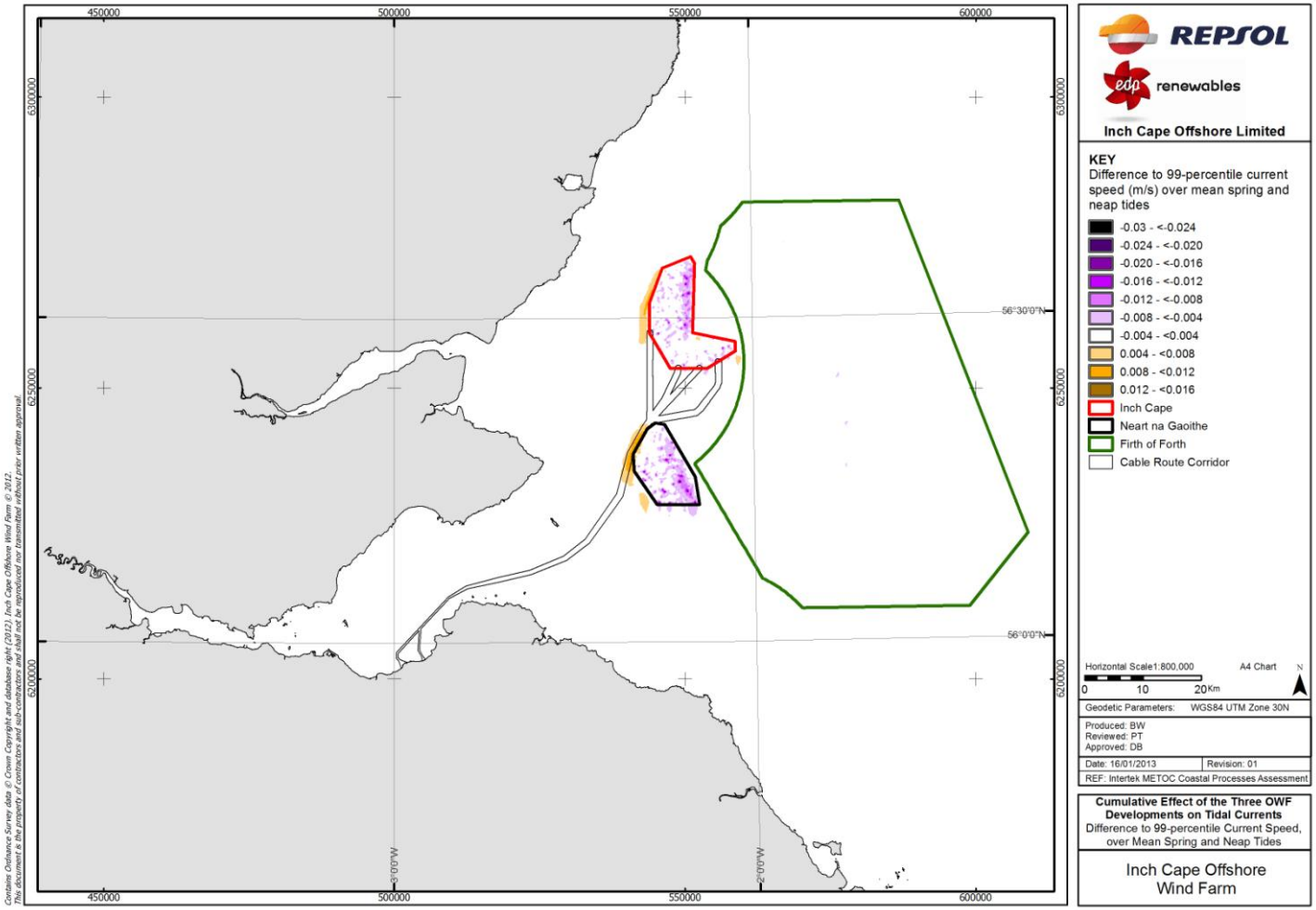
10A.7.110: Cumulative difference to 90-percentile current speed (m/s)



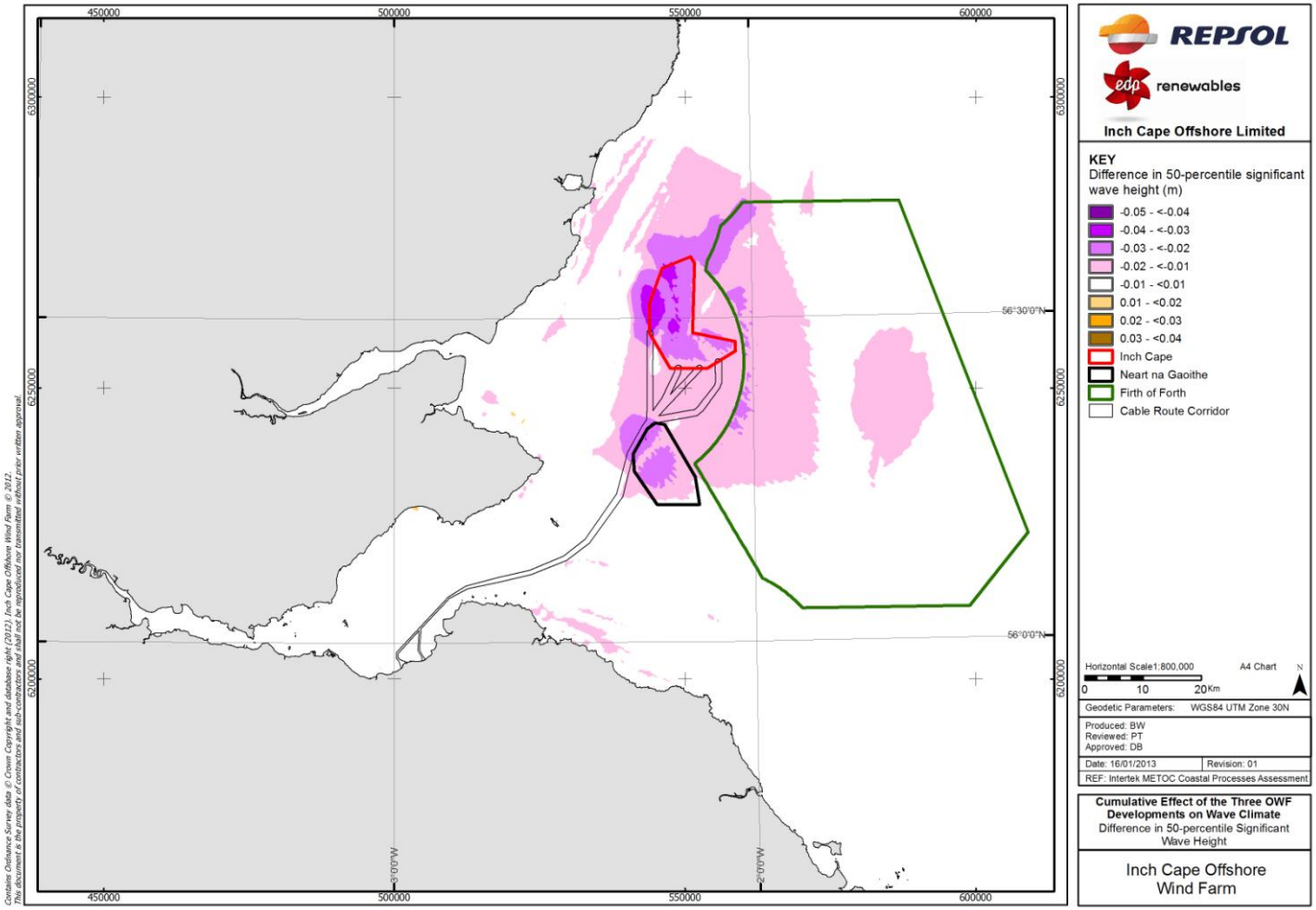
10A.7.111: Cumulative difference to 95-percentile current speed (m/s)



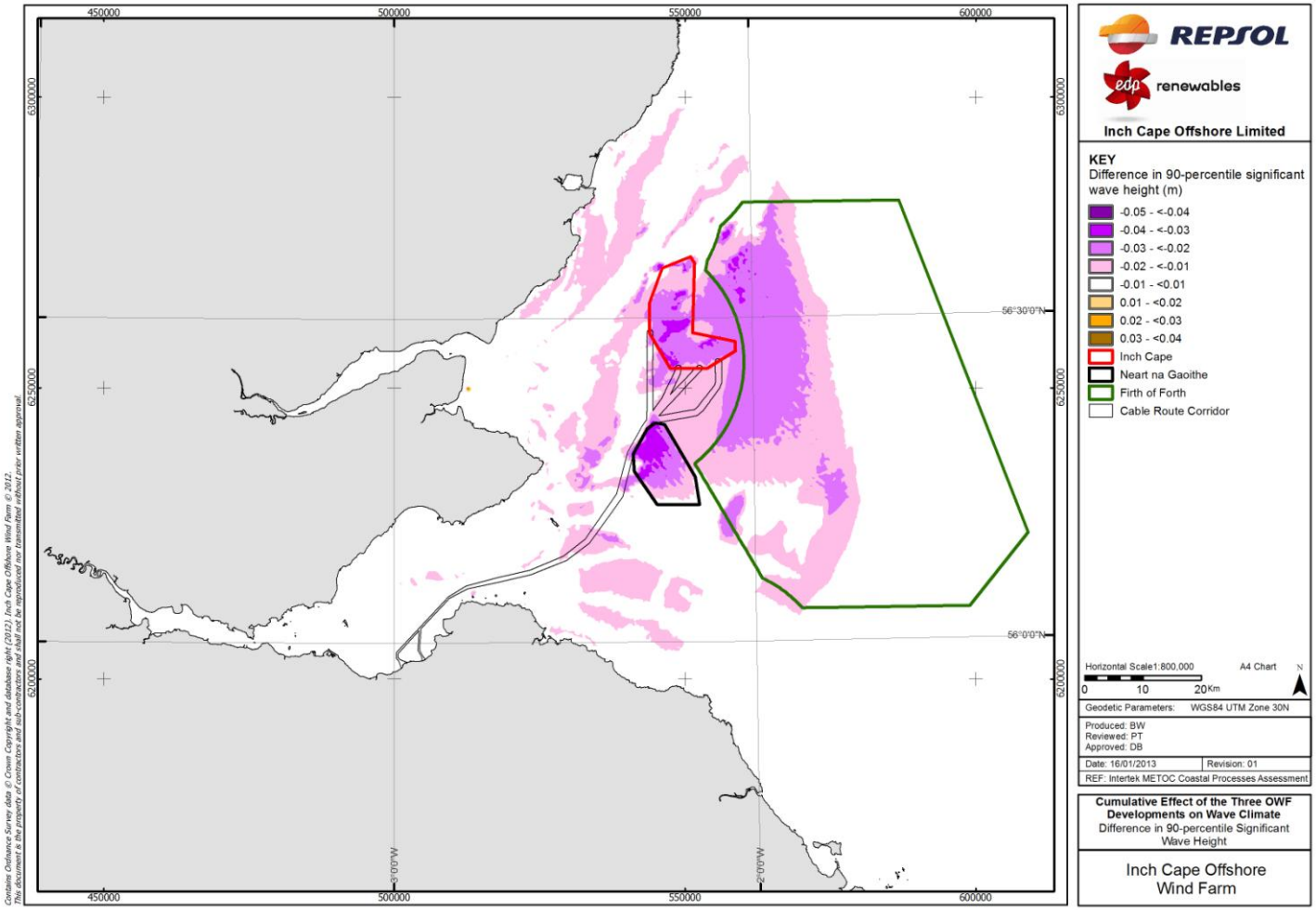
10A.7.112: Cumulative difference to 99-percentile current speed (m/s)



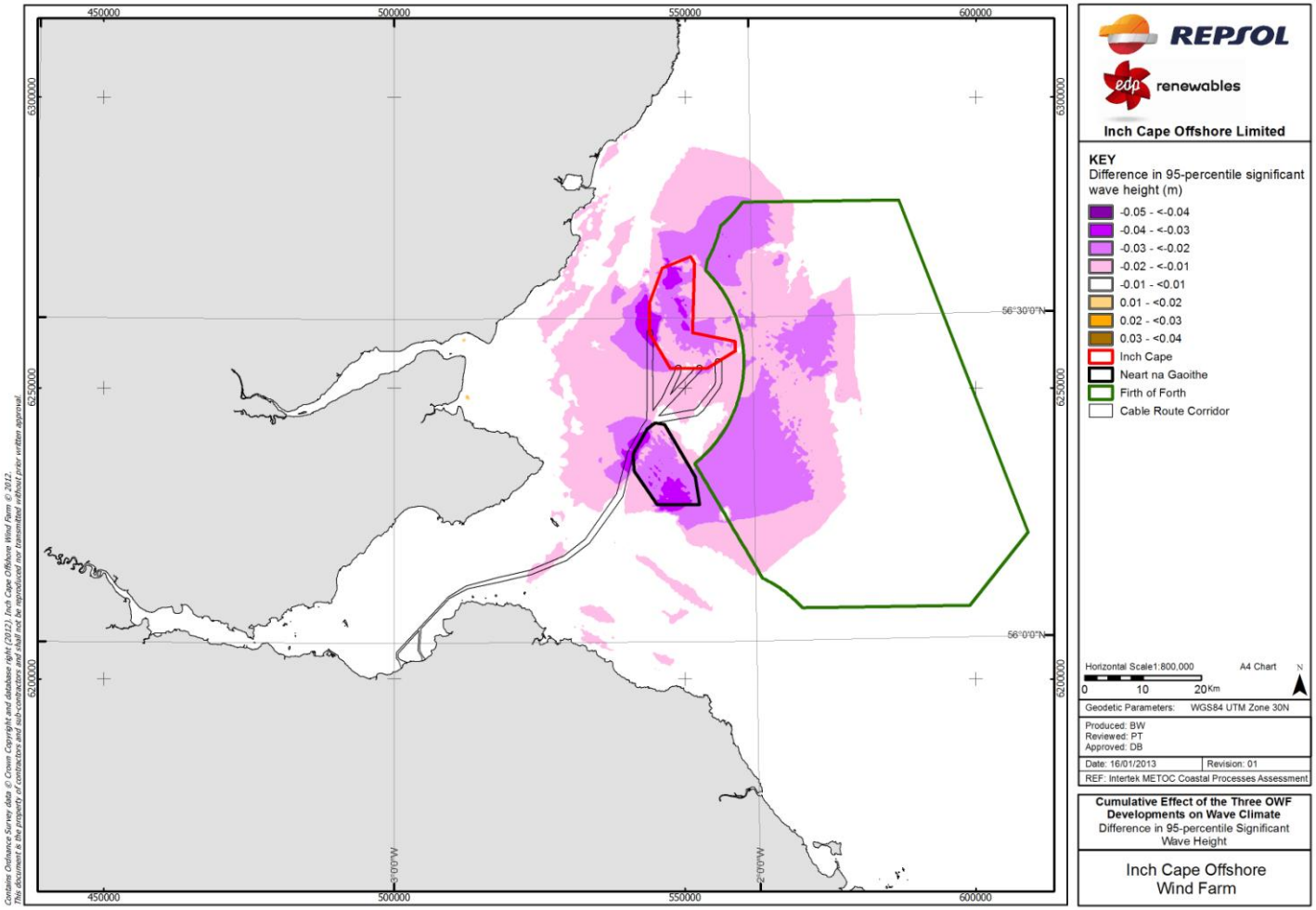
10A.7.113: Cumulative difference to 50-percentile significant wave height (m)



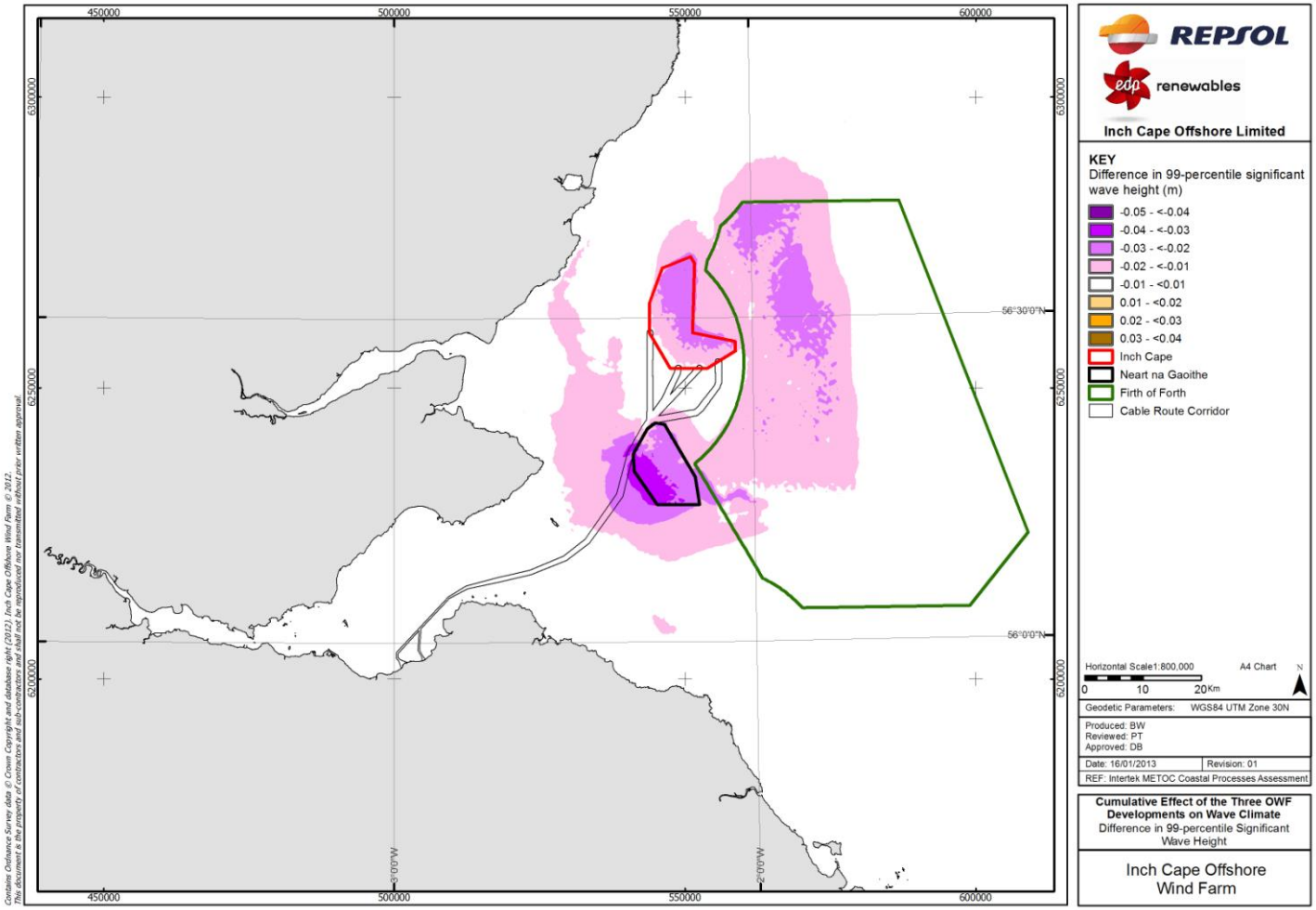
10A.7.114: Cumulative difference to 90-percentile significant wave height (m)



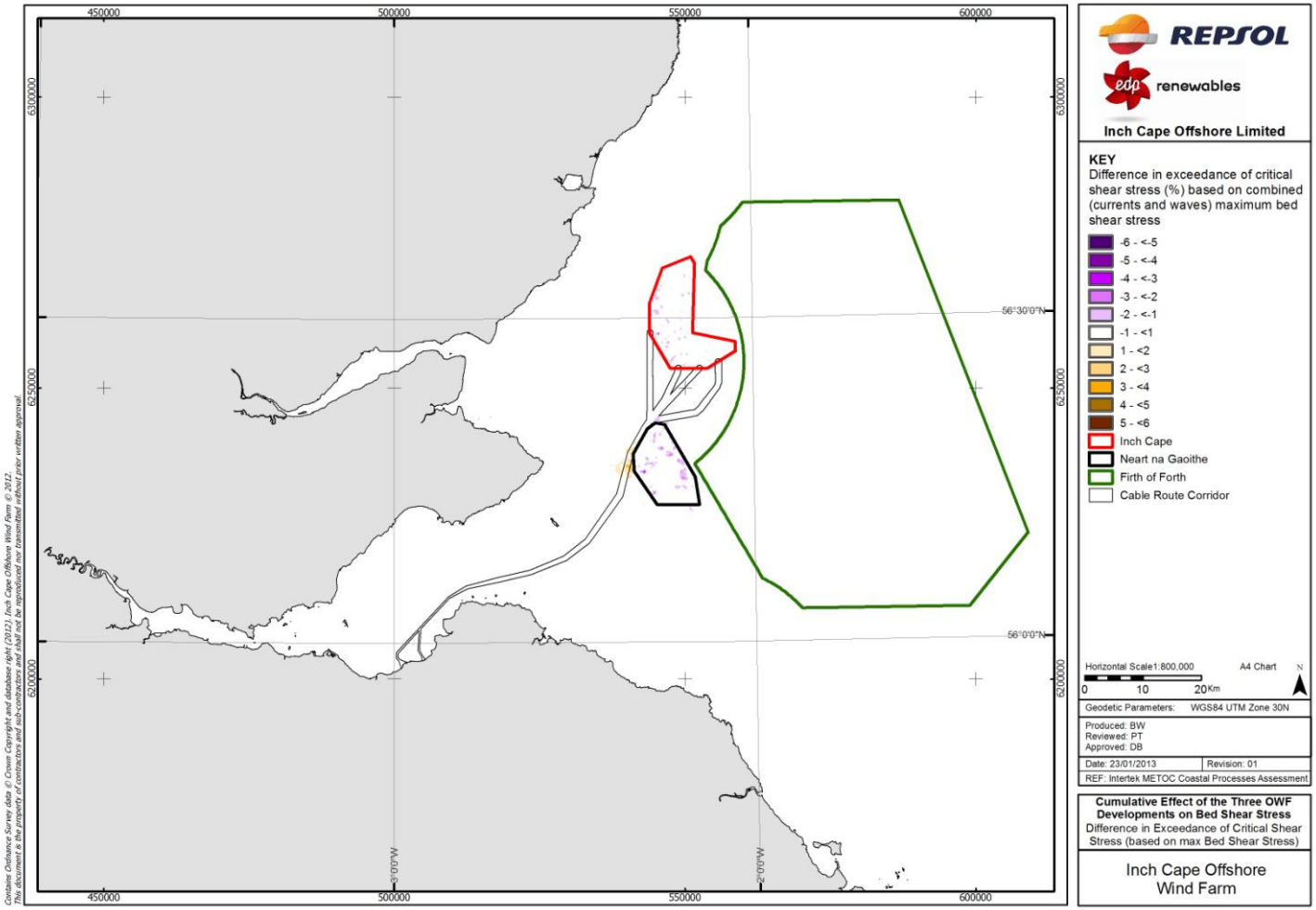
10A.7.115: Cumulative difference to 95-percentile significant wave height (m)



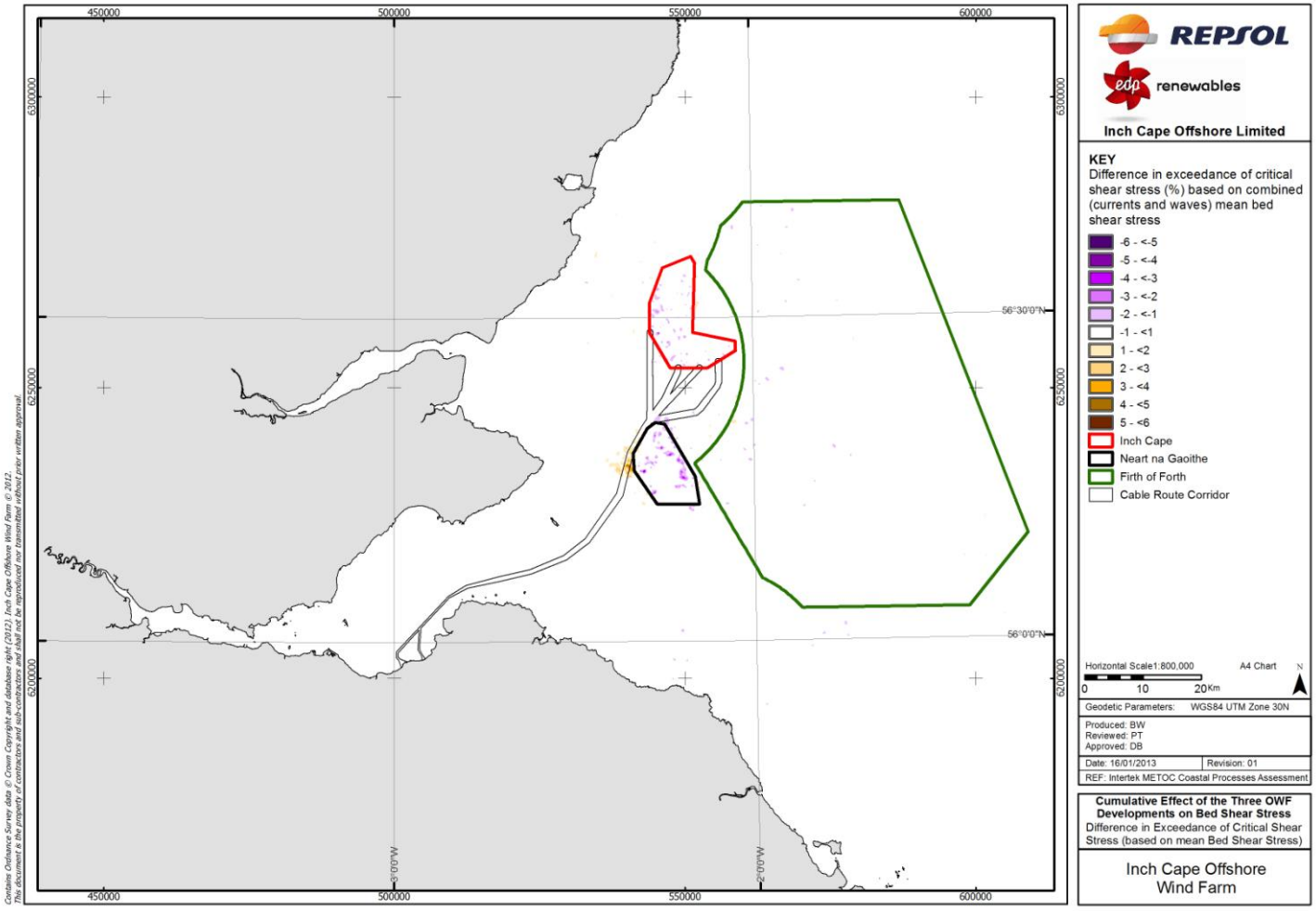
10A.7.116: Cumulative difference to 99-percentile significant wave height (m)



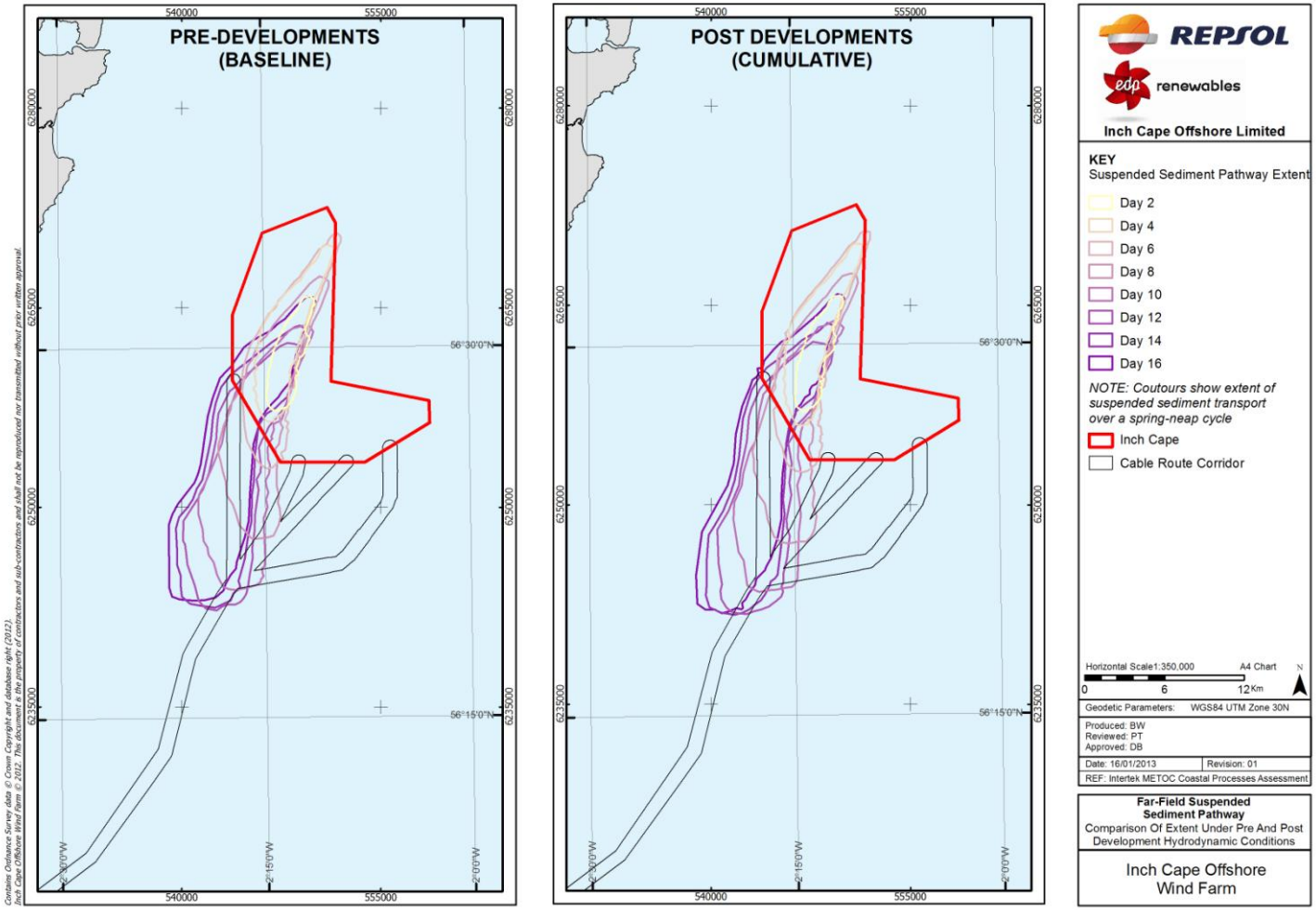
10A.7.117: Cumulative difference to exceedance of critical shear stress – based on combined (currents plus waves) maximum bed shear stress



10A.7.118: Cumulative difference to exceedance of critical shear stress – based on combined (currents plus waves) mean bed shear stress

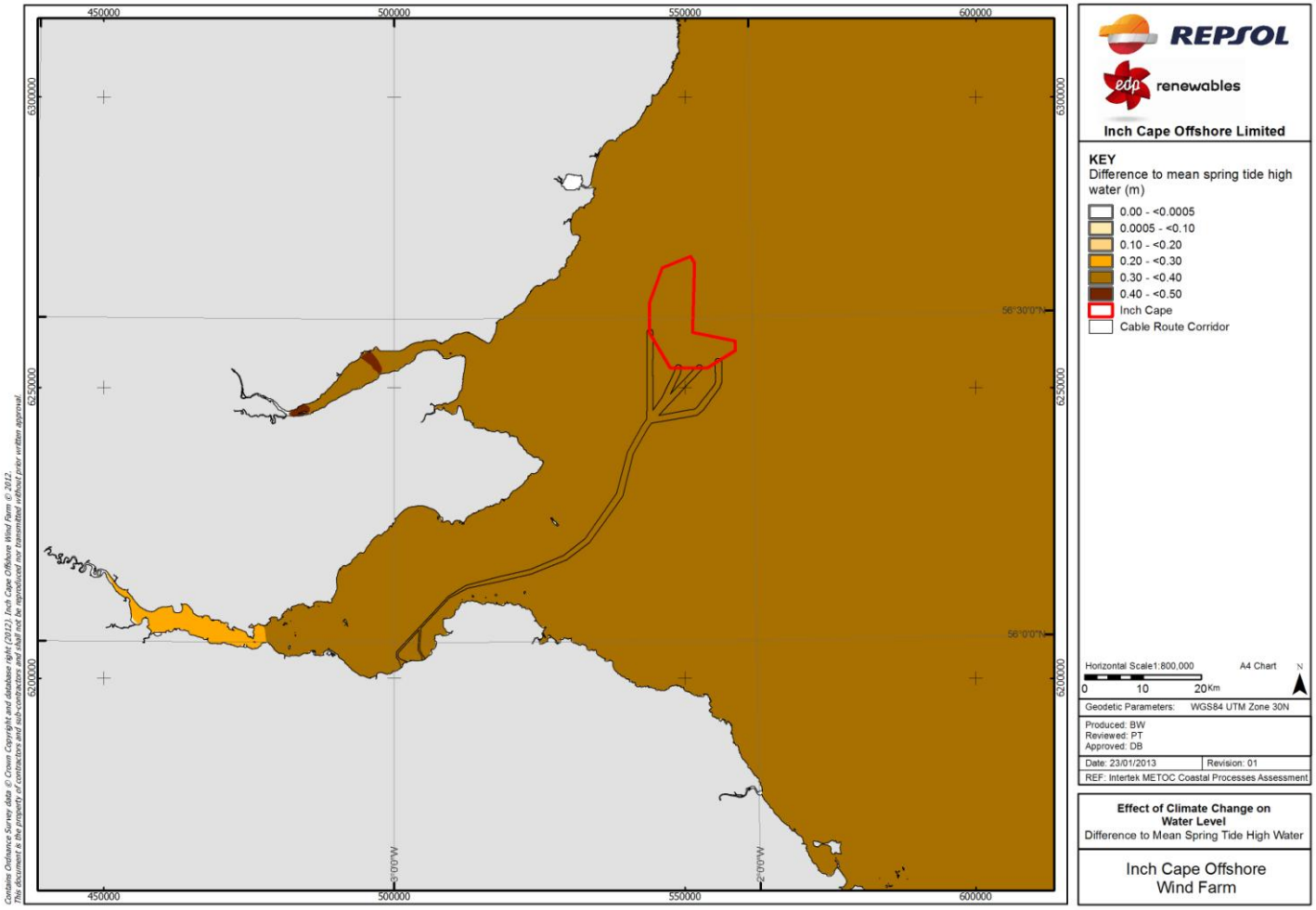


10A.7.119: Far-field suspended sediment transport pathways – pre and post developments

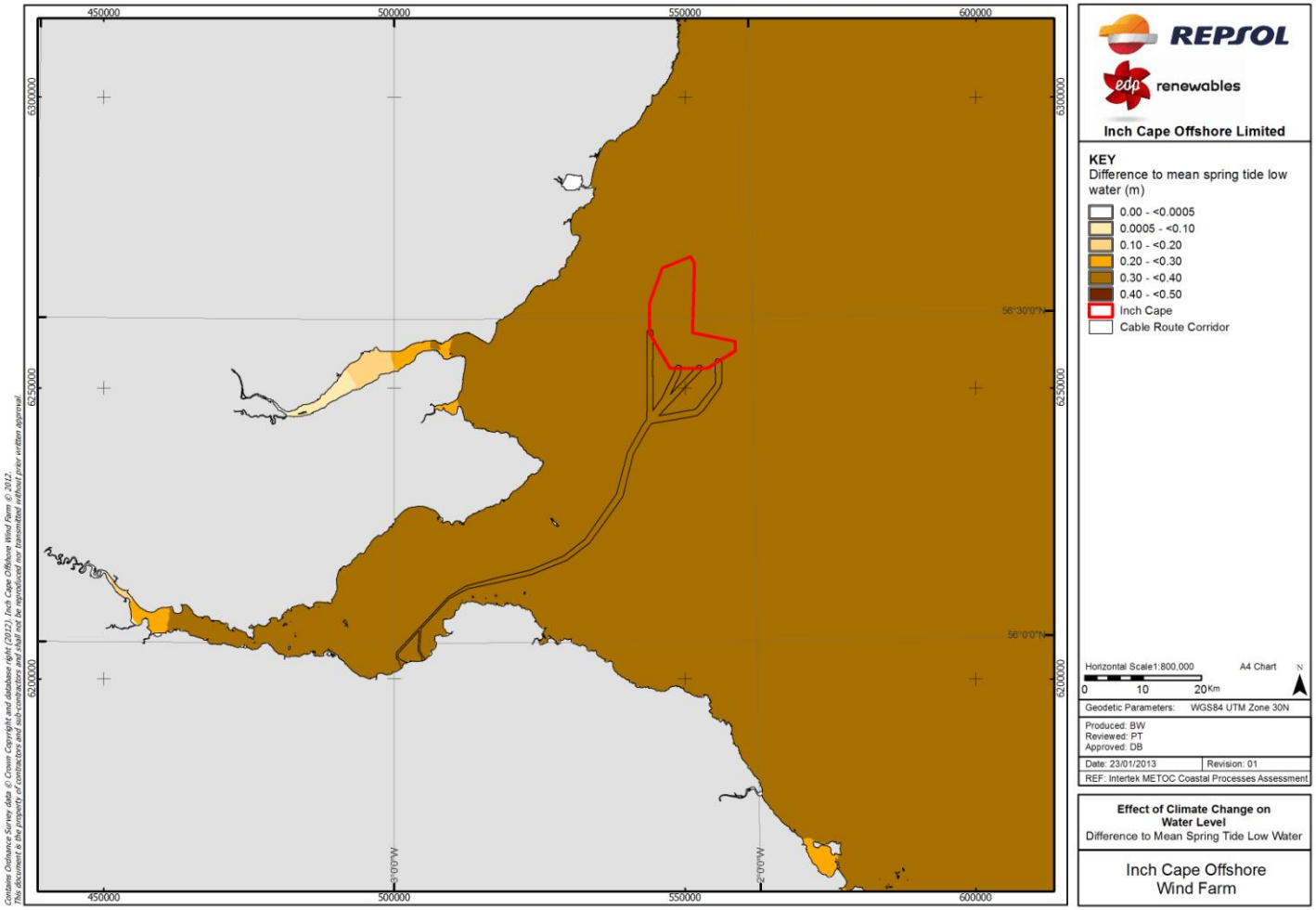


Effects due to potential climate change

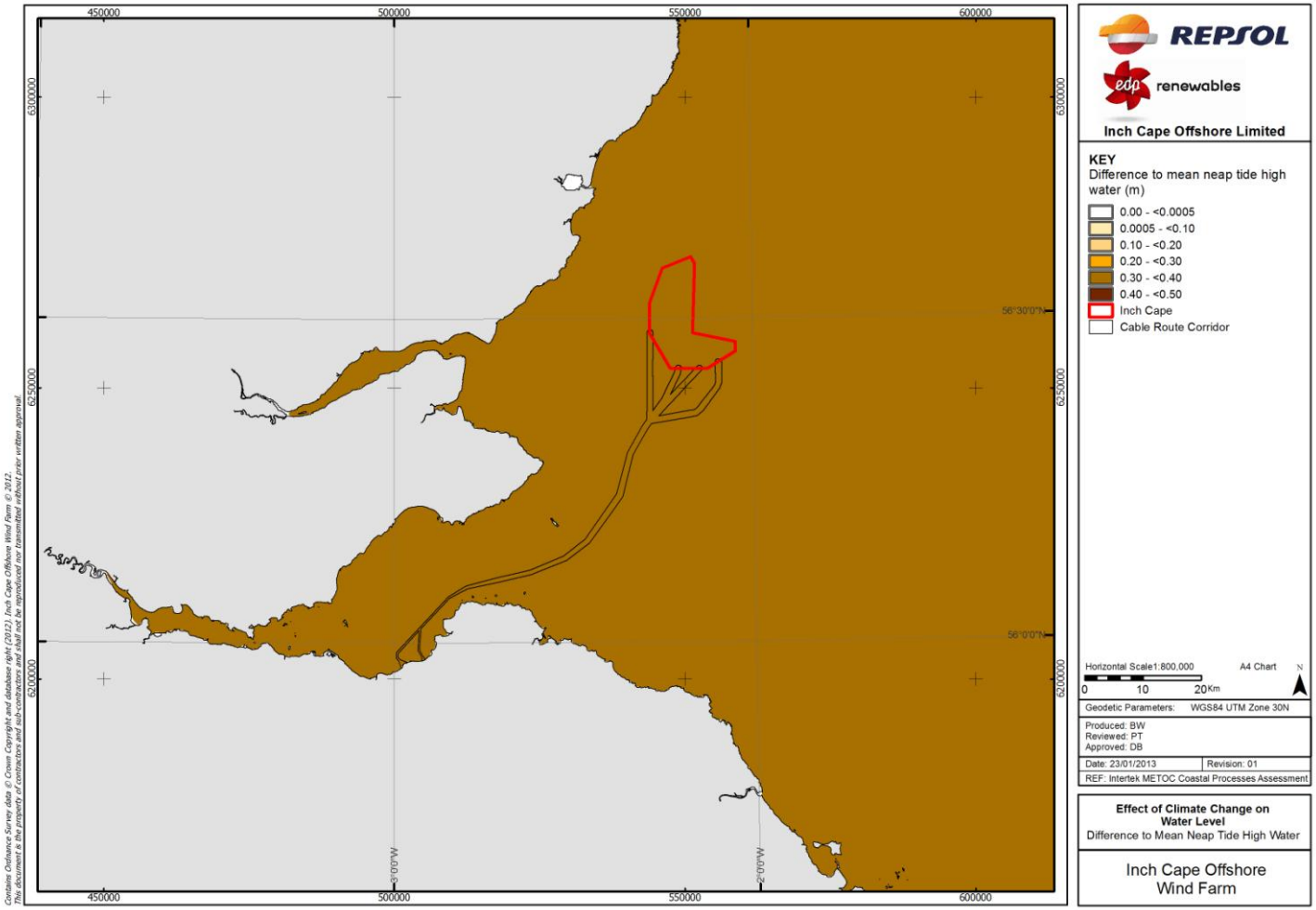
10A.7.120: Difference due to potential climate change to mean spring tide high water level (m) – far-field



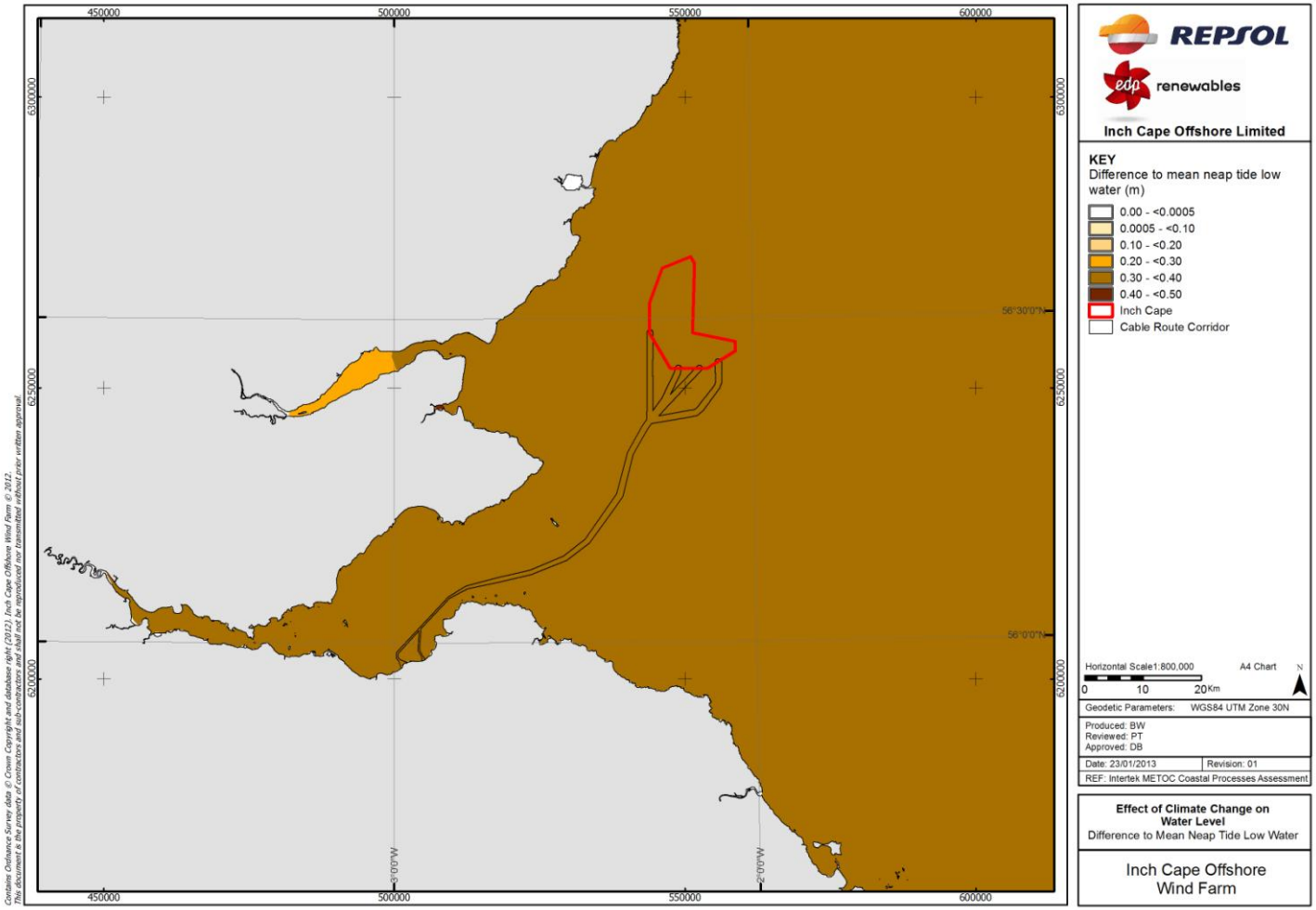
10A.7.121: Difference due to potential climate change to mean spring tide low water level (m) – far-field



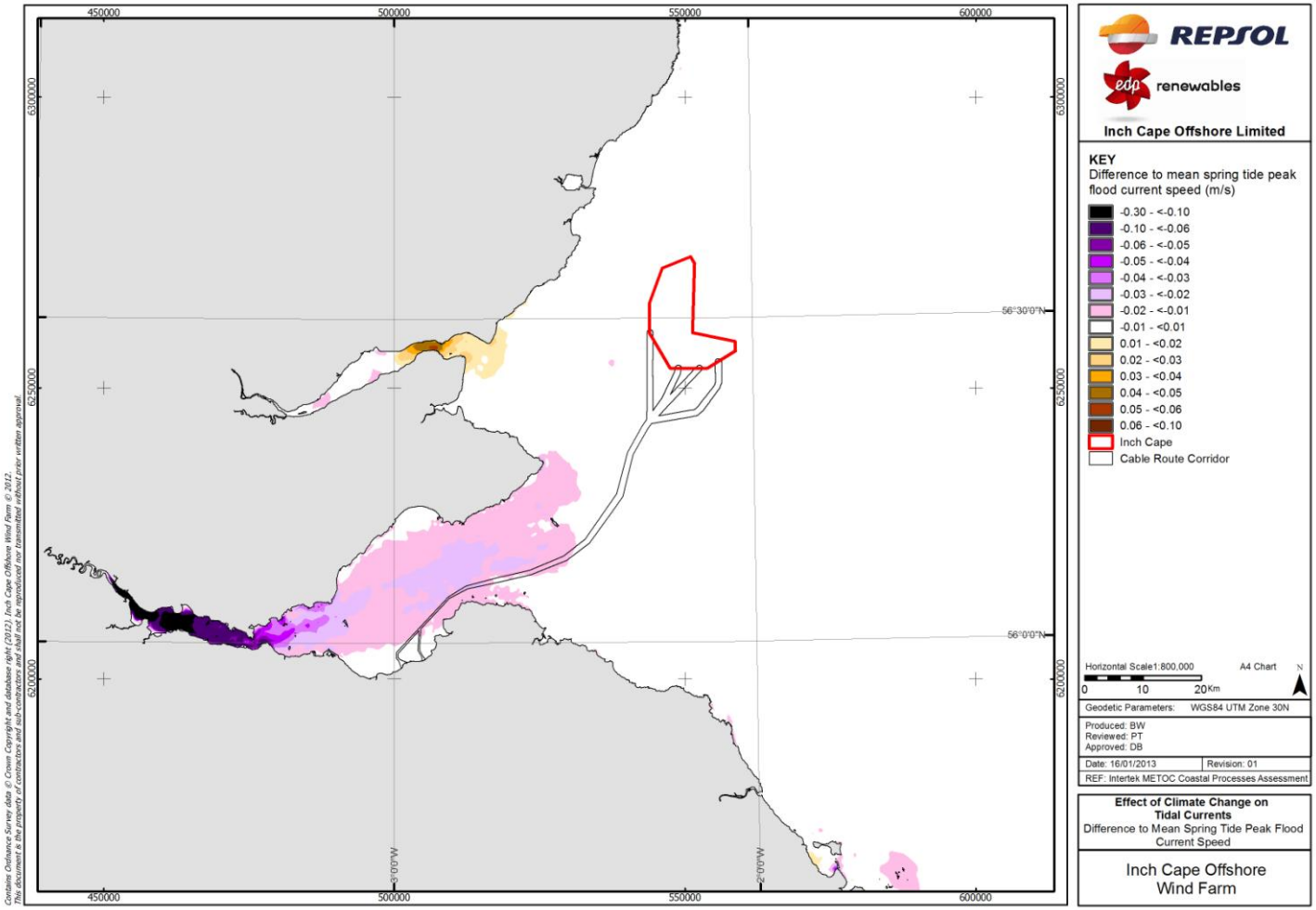
10A.7.122: Difference due to potential climate change to mean neap tide high water level (m) – far-field



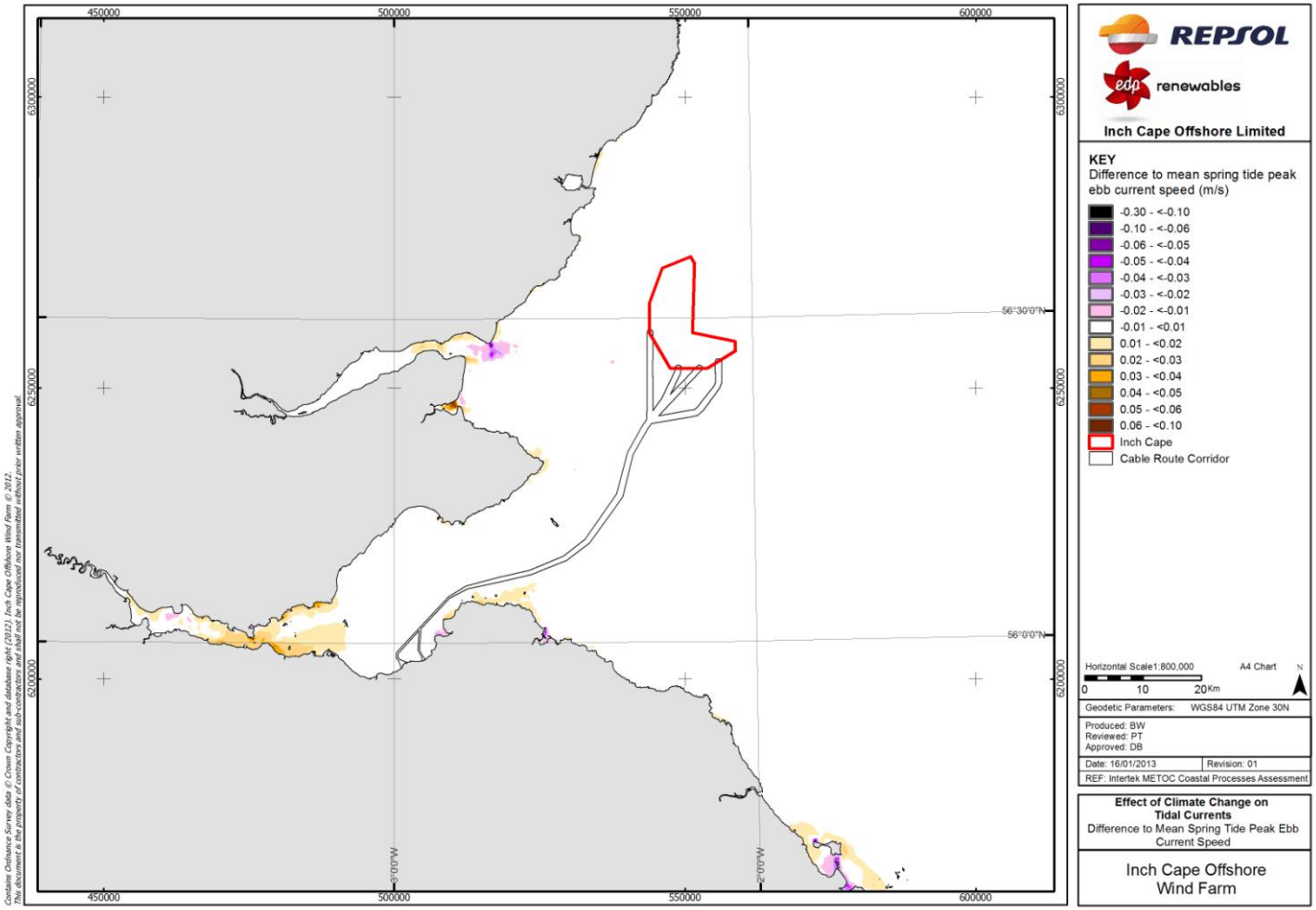
10A.7.123: Difference due to potential climate change to mean neap tide low water level (m) – far-field



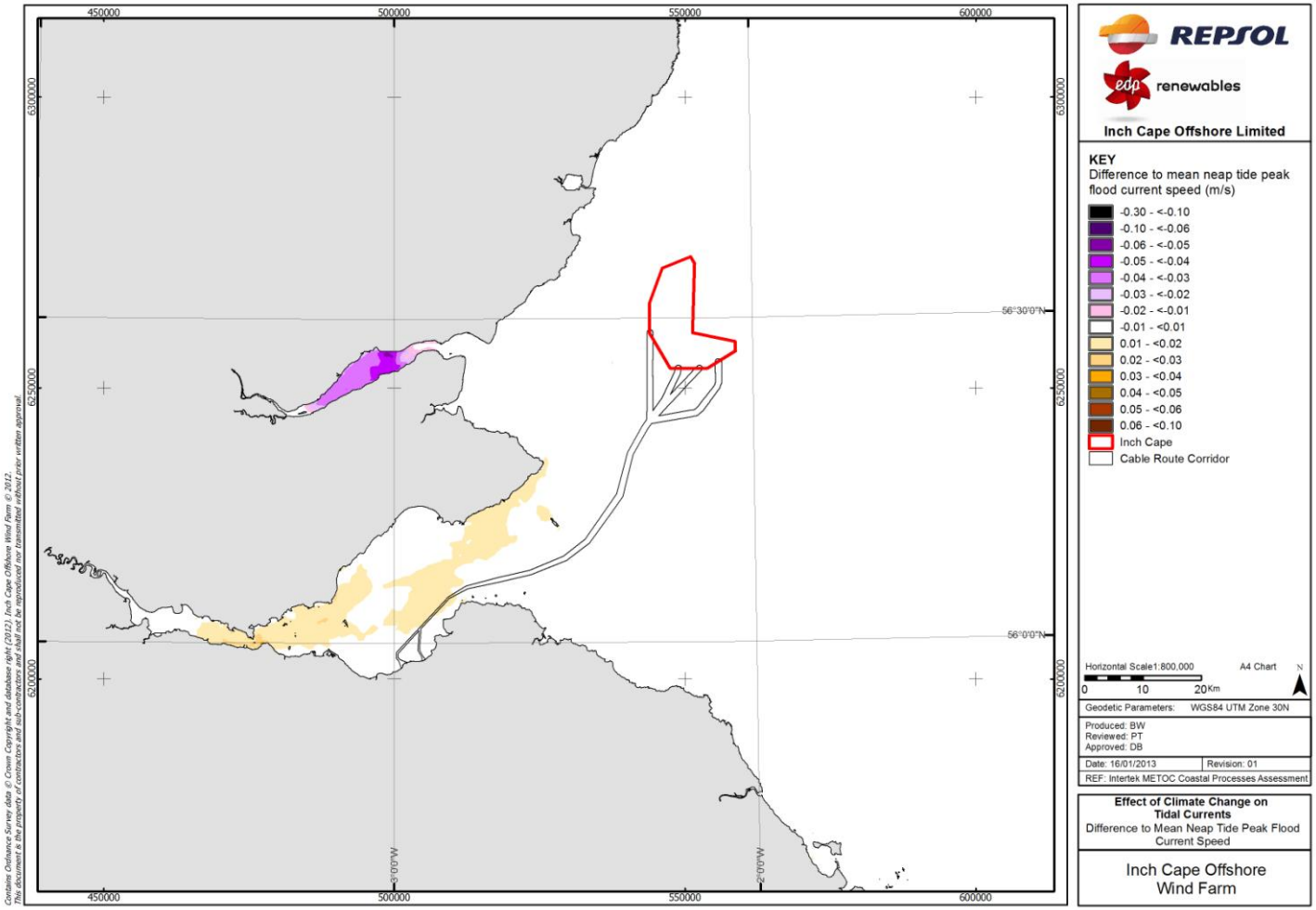
10A.7.124: Difference due to potential climate change to mean spring tide peak flood current speed (m/s) – far-field



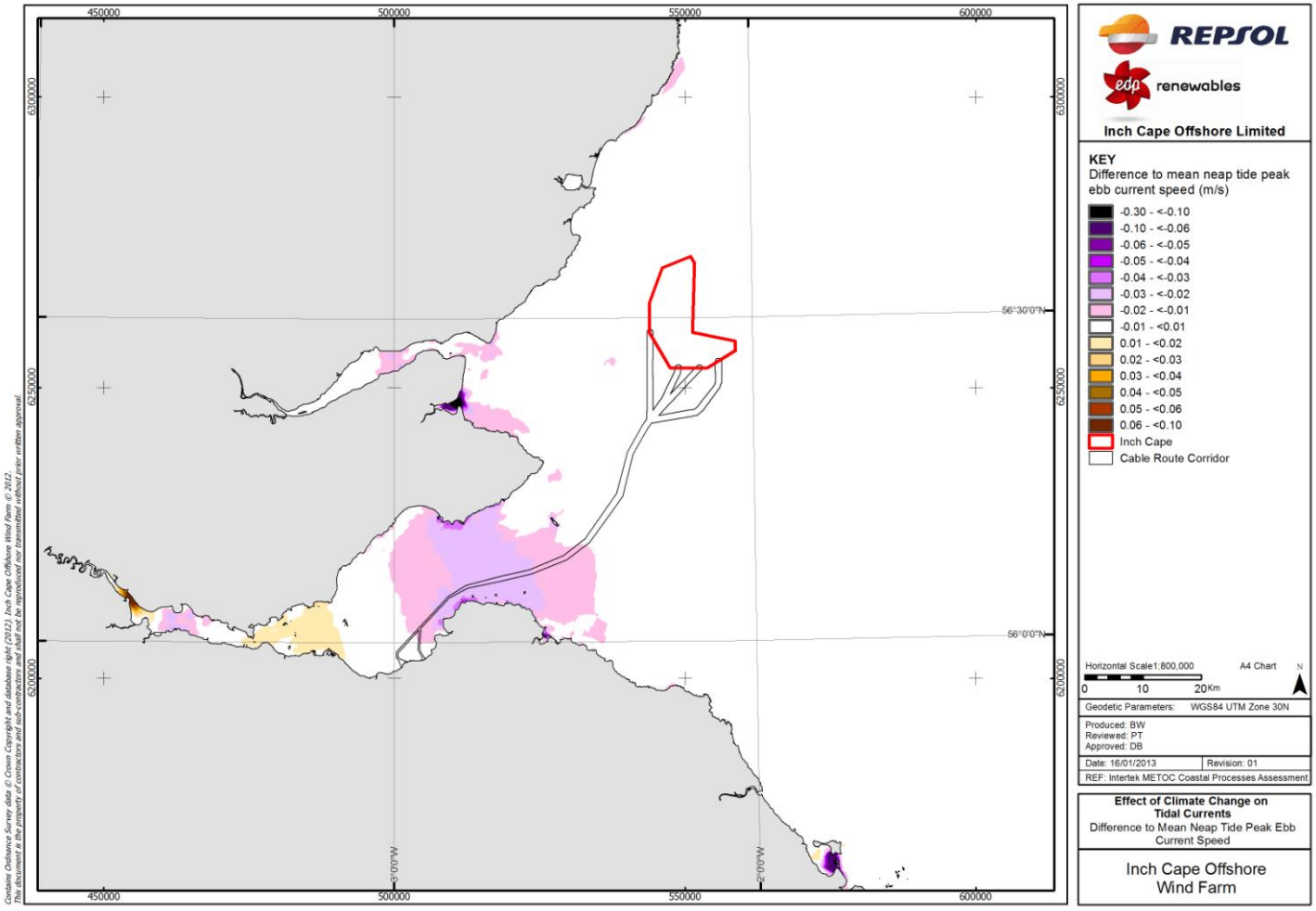
10A.7.125: Difference due to potential climate change to mean spring tide peak ebb current speed (m/s) – far-field



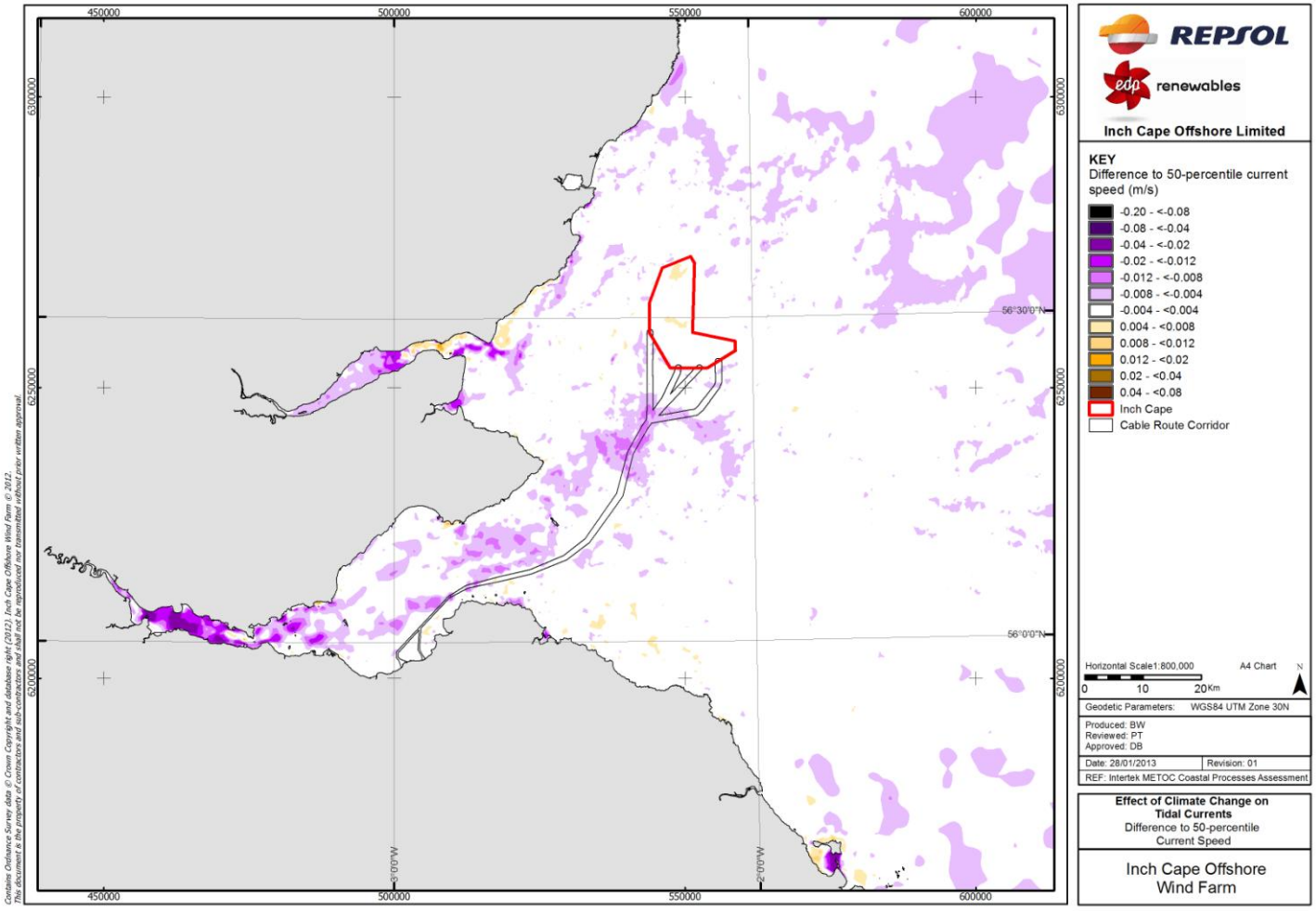
10A.7.126: Difference due to potential climate change to mean neap tide peak flood current speed (m/s) – far-field



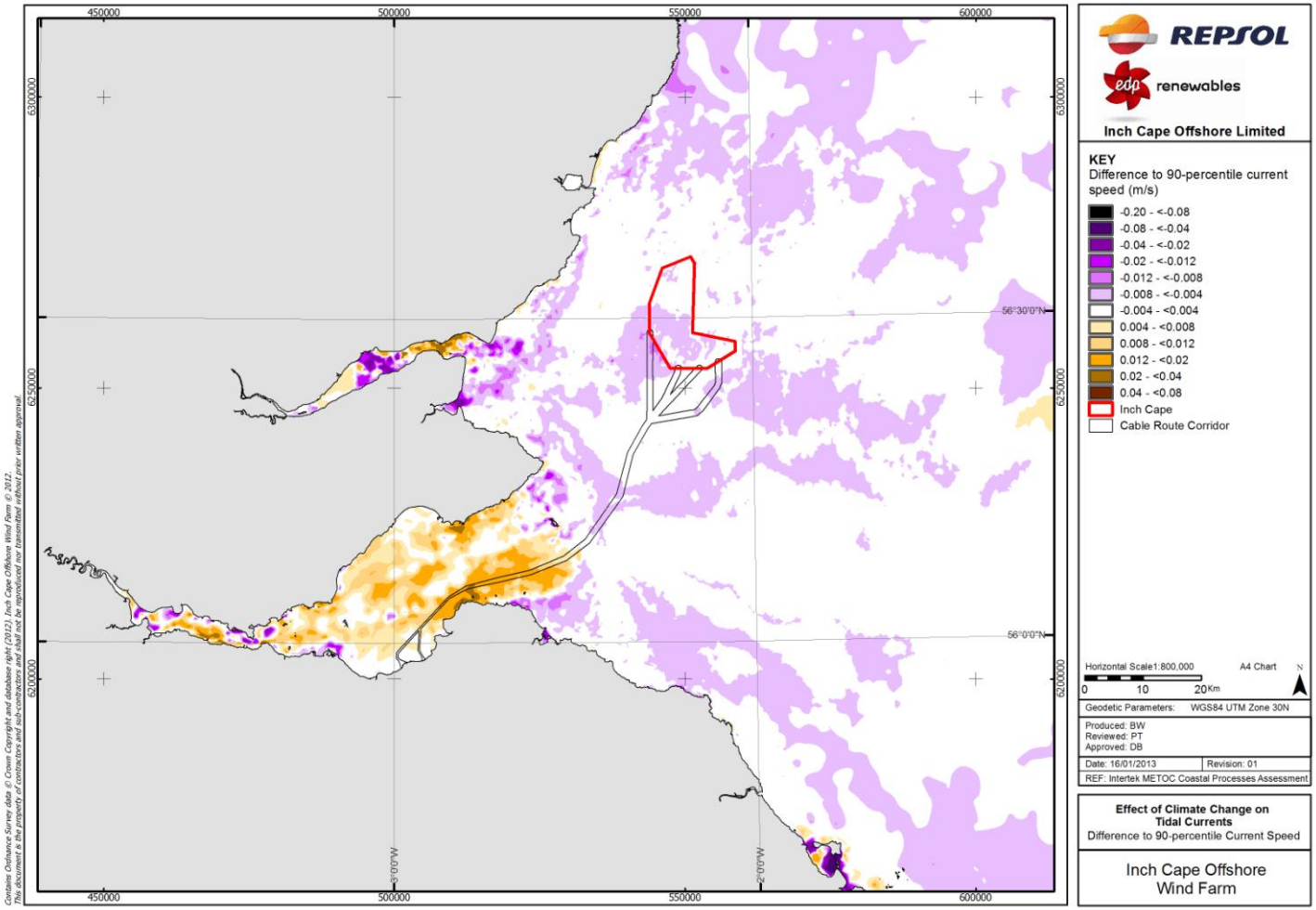
10A.7.127: Difference due to potential climate change to mean neap tide peak ebb current speed (m/s) – far-field



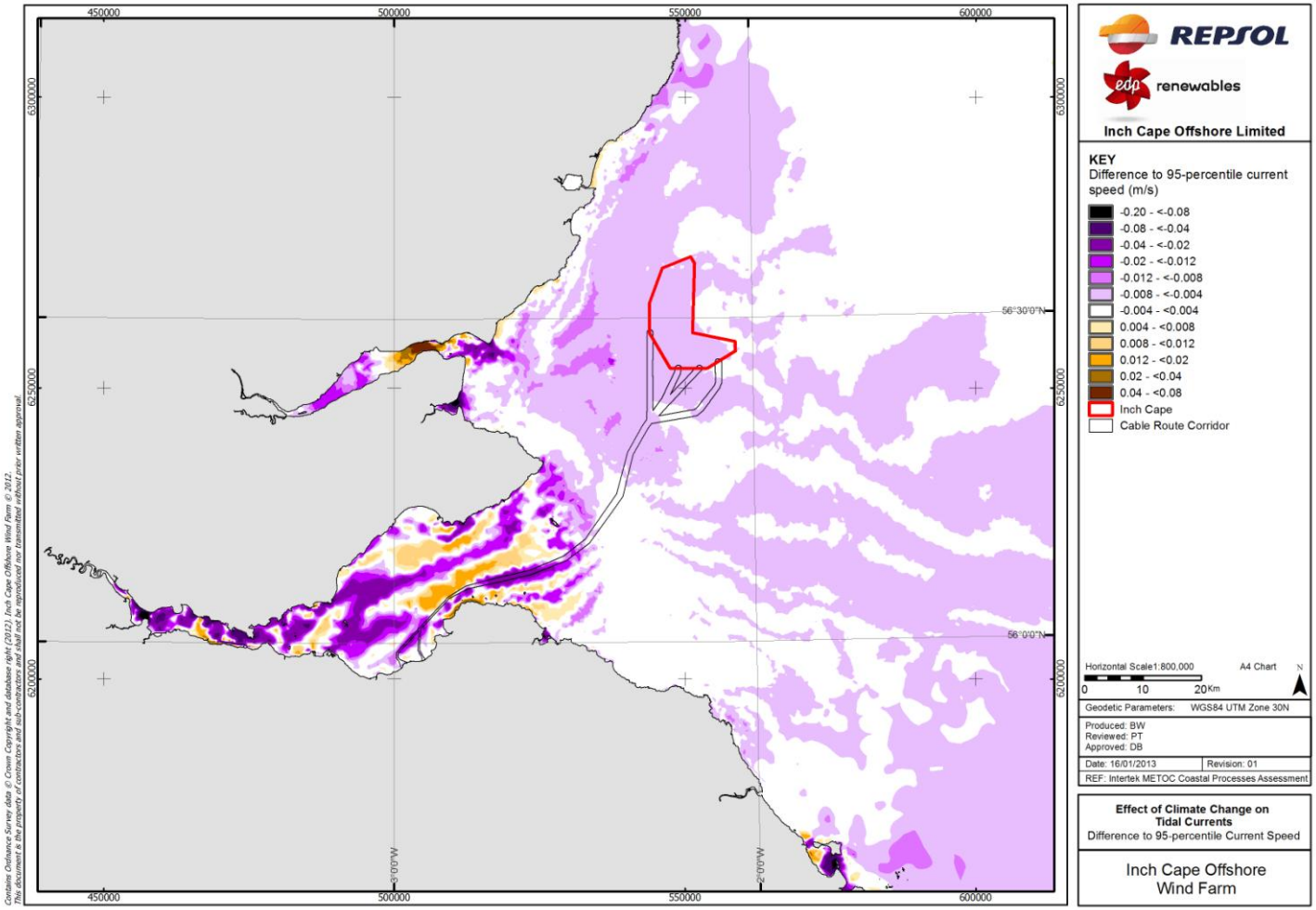
10A.7.128: Difference due to potential climate change to 50-percentile current speed (m/s) – far-field



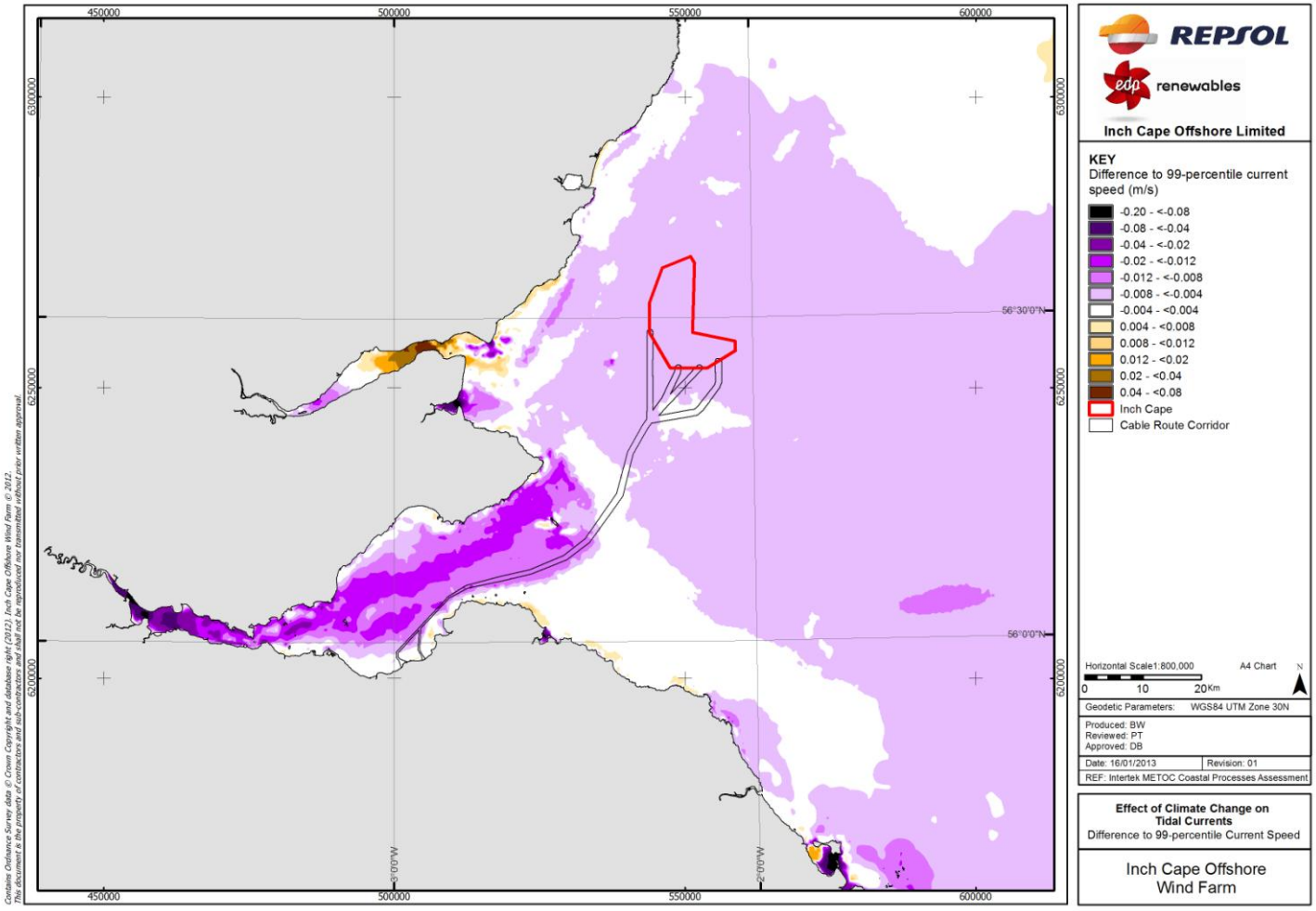
10A.7.129: Difference due to potential climate change to 90-percentile current speed (m/s) – far-field



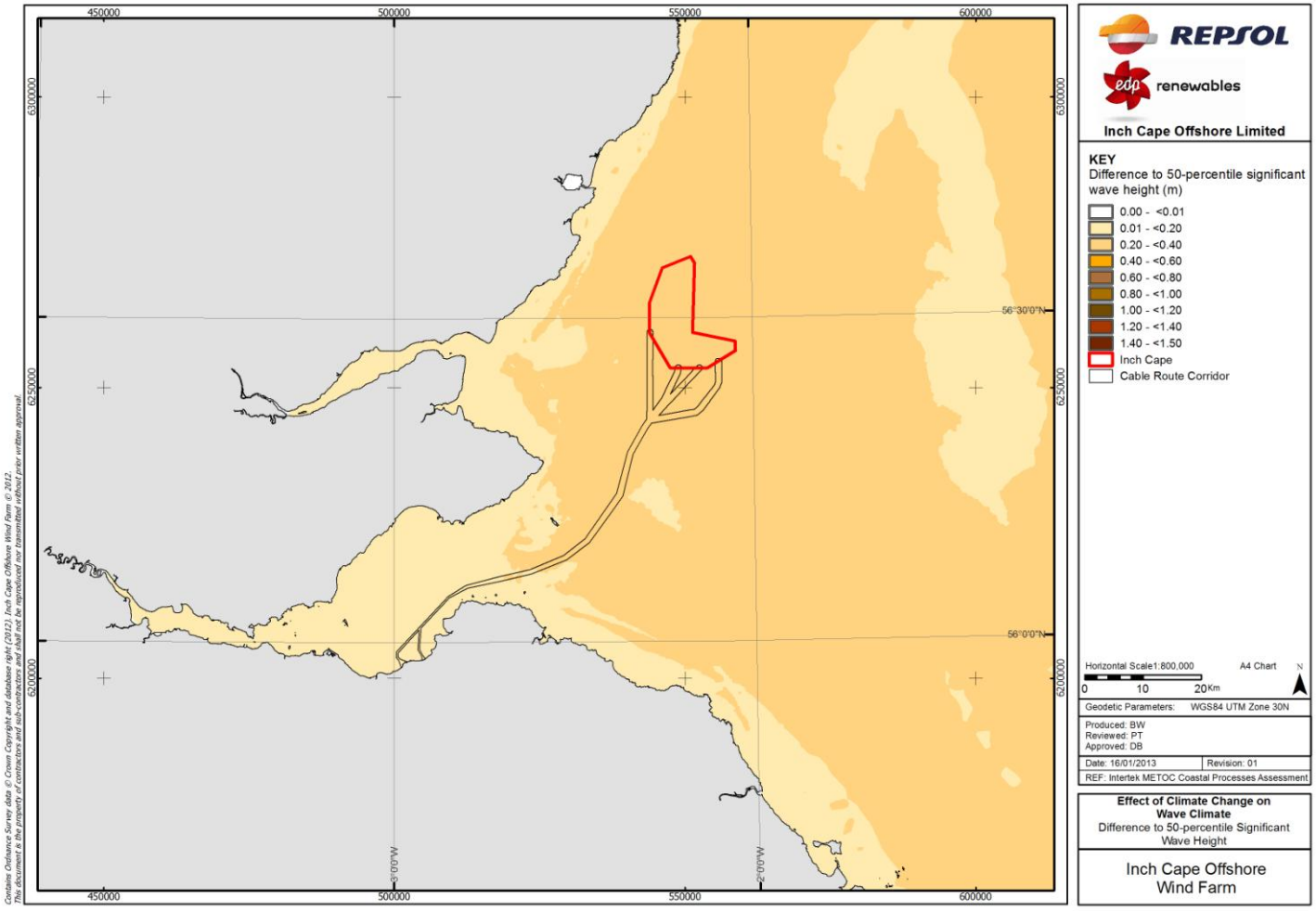
10A.7.130: Difference due to potential climate change to 95-percentile current speed (m/s) – far-field



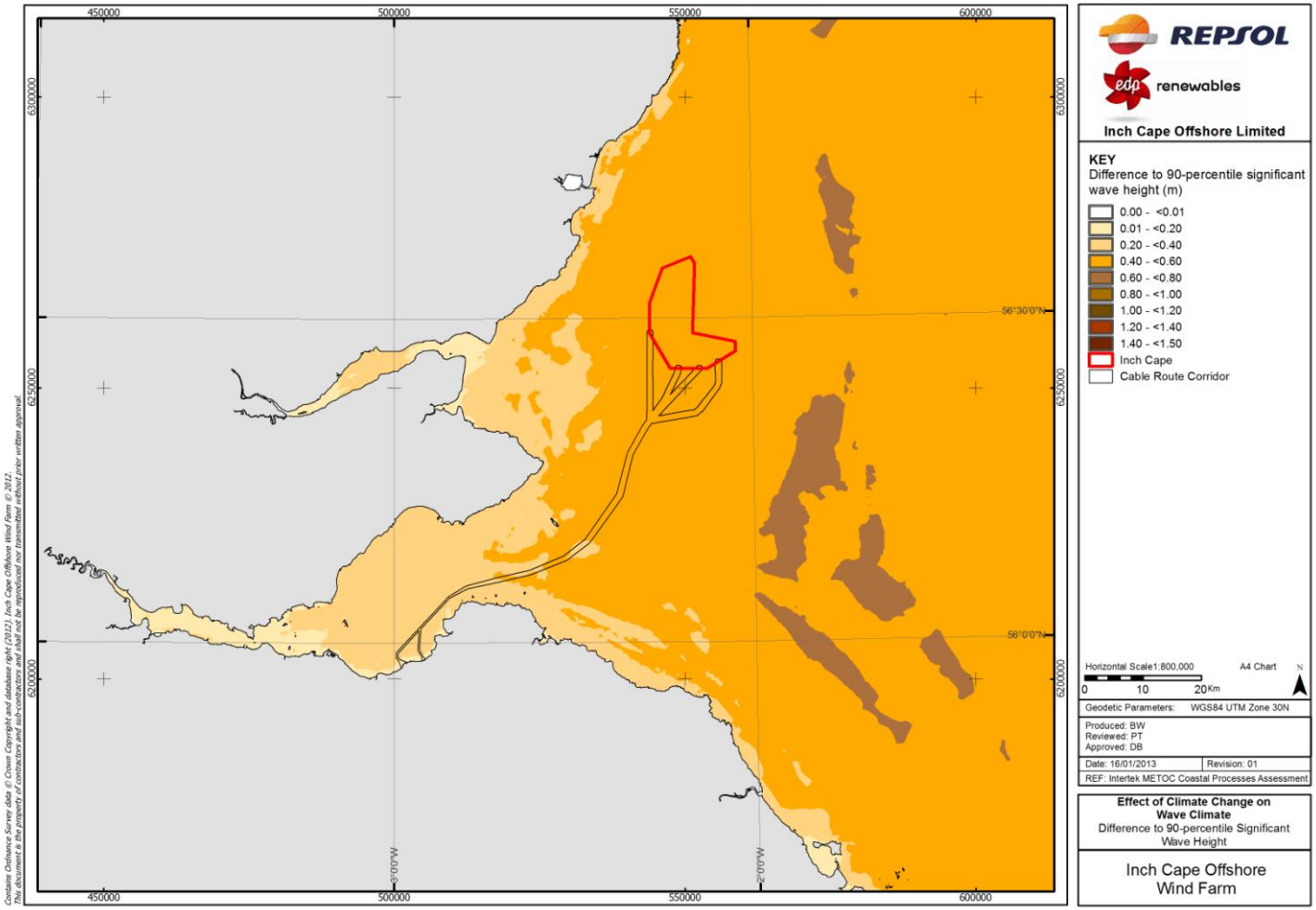
10A.7.131: Difference due to potential climate change to 99-percentile current speed (m/s) – far-field



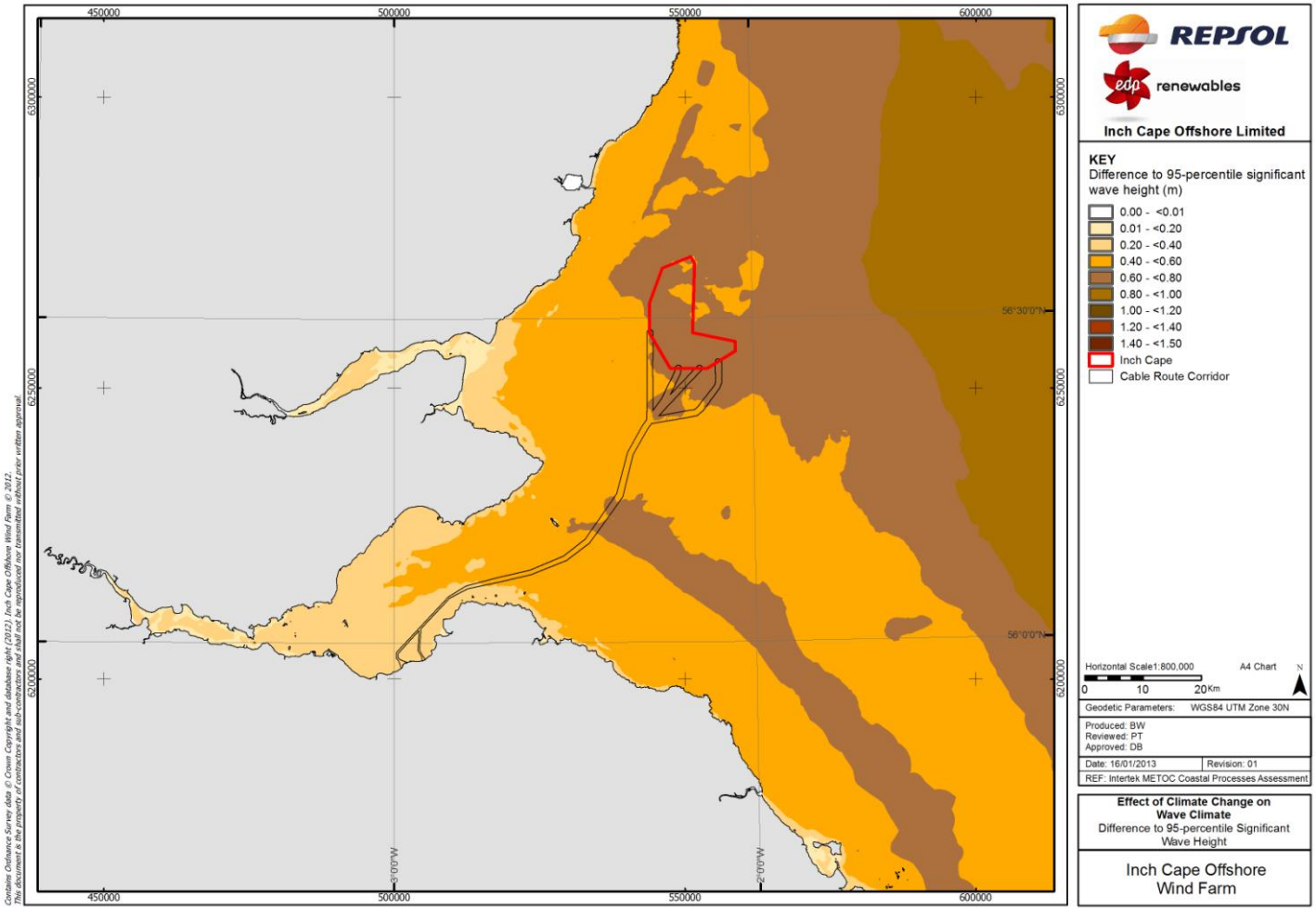
10A.7.132: Difference due to potential climate change to 50-percentile significant wave height (m) – far-field



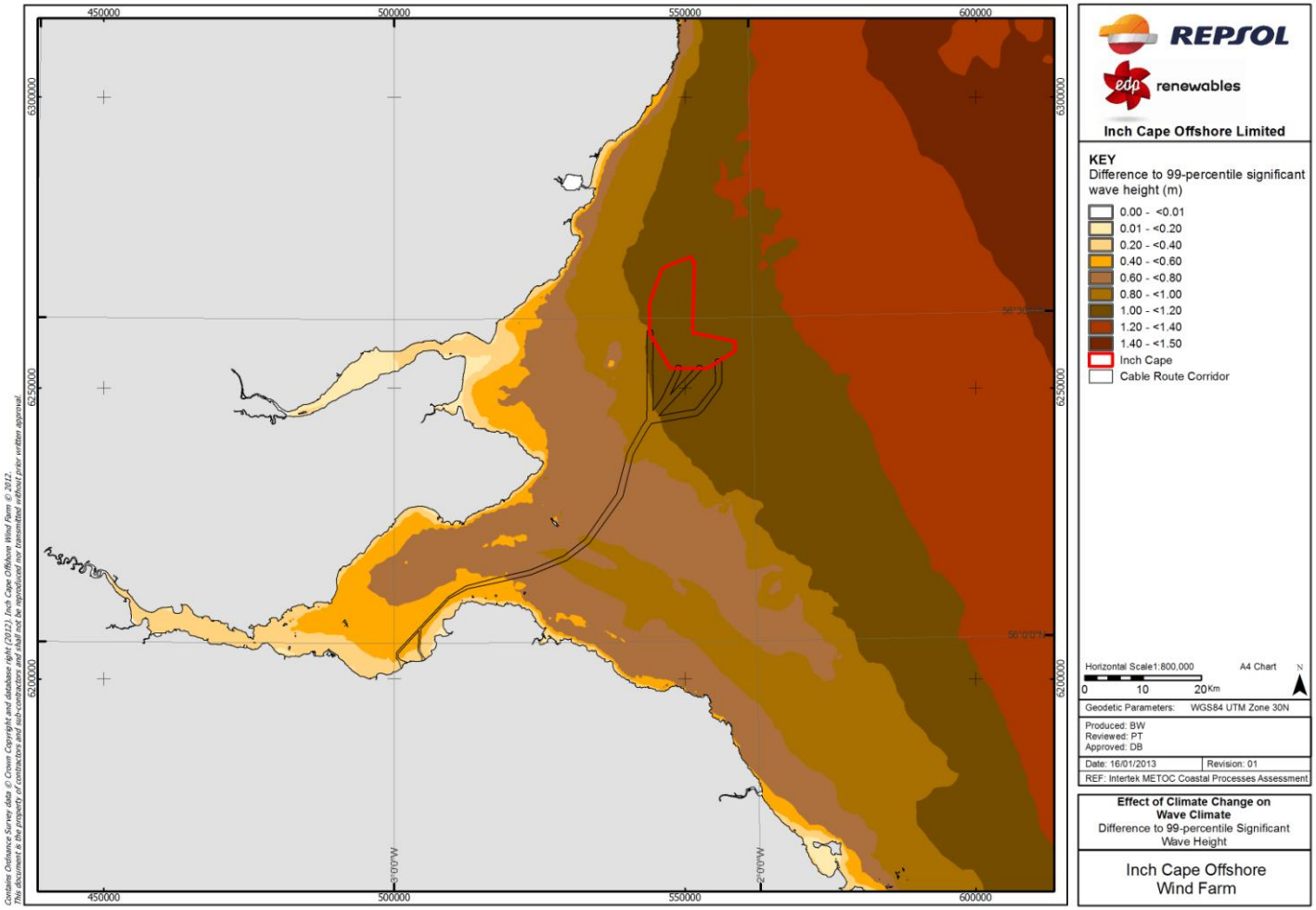
10A.7.133: Difference due to potential climate change to 90-percentile significant wave height (m) – far-field



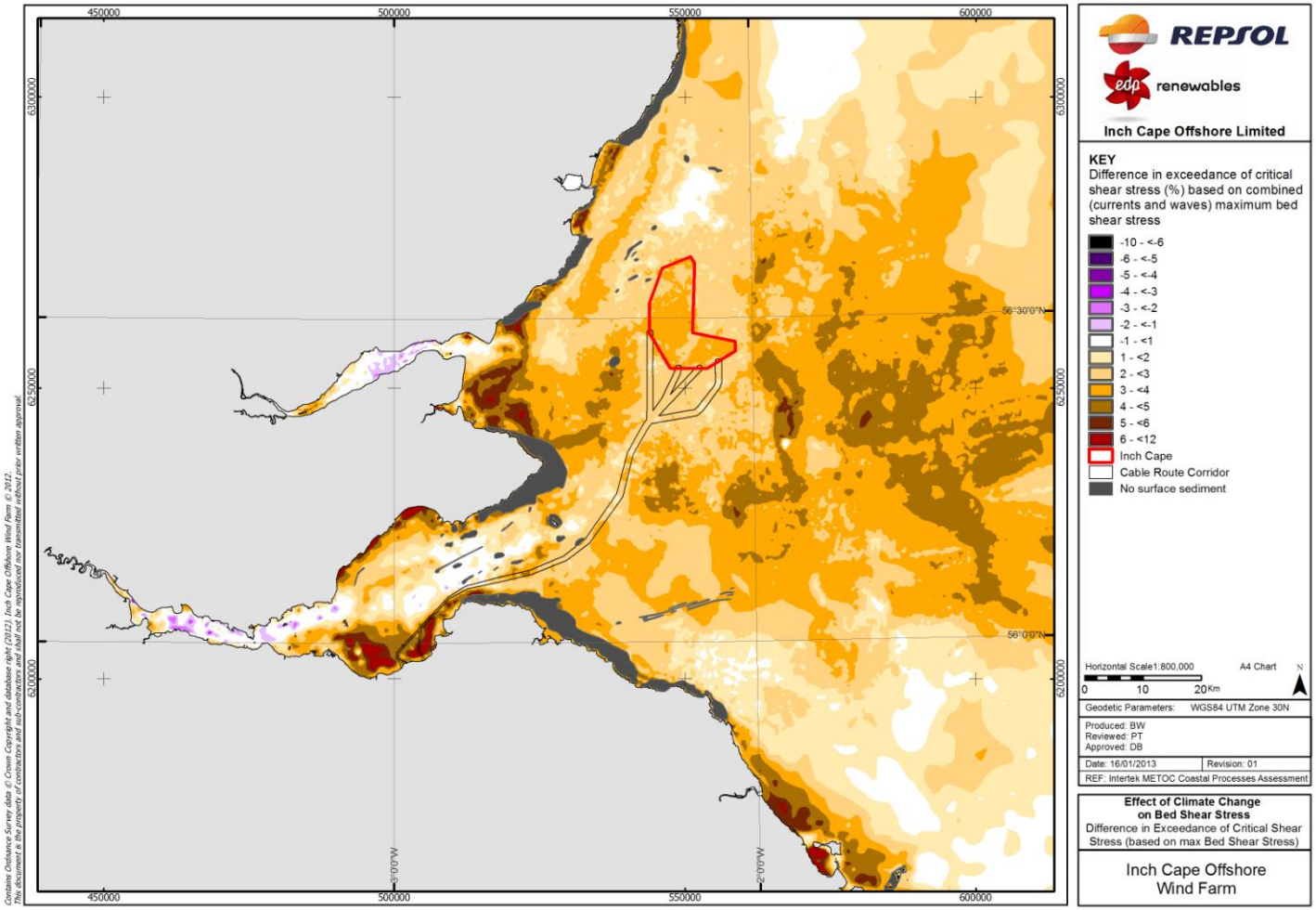
10A.7.134: Difference due to potential climate change to 95-percentile significant wave height (m) – far-field



10A.7.135: Difference due to potential climate change to 99-percentile significant wave height (m) – far-field



10A.7.136: Difference due to potential climate change of critical shear stress – based on combined (currents plus waves) maximum bed shear stress – far-field



10A.7.137: Difference due to potential climate change of critical shear stress – based on combined (currents plus waves) mean bed shear stress – far-field