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16 March 2010
By Post and email

Attn : Dr. Glenn Frommer

Dear Sir

**Express Rail Link
Consultancy Agreement No. C806
Independent Environmental Checker (IEC)
Environmental Permit No.: EP-349/2009
Condition 2.21 – Revised Contamination Assessment Plan for Lai Chi Kok Works Area
(LCW)**

We refer to the receipt of revised CAP for LCW Works Area on 12 March 2010 based on EPD's comments. Pursuant to the EP Condition 2.21, I hereby verify the Revised Contamination Assessment Plan for Lai Chi Kok Works Area (LCW).

Yours faithfully,
for MOTT MACDONALD HONG KONG LIMITED



Dr. Anne Kerr
Independent Environmental Checker (IEC)

MTR Corporation Limited

HONG KONG SECTION OF GUANGZHOU –
SHENZHEN – HONG KONG EXPRESS RAIL LINK
(No. EP-349/2009)

Revised Contamination Assessment Plan for
Lai Chi Kok Works Area (Site K)
(Revision C)

Certified by:

Position:

Date:

Glenn Frommer
Environmental Team Leader
18 MAR 2010

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1. INTRODUCTION

- 1.1 The Hong Kong Section of the XRL will be a 26-km long underground rail line on a dedicated track that runs from the terminus located in West Kowloon to the boundary at Huanggang, as shown in **Figures NOL/ERL/300/C/XRL/ENS/M50/001-003**.
- 1.2 An Environmental Impact Assessment (EIA) for the Hong Kong Section of XRL was conducted and approved under the Environmental Impact Assessment Ordinance (EIAO) on 28 September 2009 (Register No. AEIAR-143/2009). An Environmental Permit (EP) No. EP-349/2009 was granted by the Director of Environmental Protection (DEP) on 16 October 2009.
- 1.3 During the time of EIA Study, some of the land lots/facilities within the development area, including Lai Chi Kok Works Area (LCW, also known as Site K), were not fully surveyed and/or assessed due to site constraints. In this respect, the approved EIA specifies those inaccessible lots/facilities needed to be further assessed after land resumption and prior to the commencement of the construction works at respective site. Pursuant to EP Condition 2.21, revised contamination assessment plan (CAP) with updated sampling and testing schedule based on respective site condition, supplementary contamination assessment reports (CARs) and if contamination found, supplementary remediation action plan (RAP) should be submitted to Environmental Protection Department (EPD) for approval prior to the commencement of works.
- 1.4 LCW (Site K) is located at the junction between Sham Mong Road and Sham Shing Road in Nam Cheong area. It is located adjacent to Feoso Building and HKIVE Haking Wong Waterfront Annex. The location of LCW (Site K) is shown in **Figure NOL/ERL/300/C/XRL/ENS/M57/524**. With reference to **Figure NOL/ERL/300/C/XRL/ENS/M57/021** of the approved CAP, LCW (Site K) was a vacant lot, in the size of 300 m², covered with vegetation. According to Table 5.4 of the approved CAP in EIA Report which included the findings of site appraisal result for LCW, chemical storage was found at Feoso Building, the location of which was shown in **Figure NOL/ERL/300/C/XRL/ENS/M57/021** of the approved CAP. According to Table 5.8 of the approved CAP, it was identified that contamination due to chemical stored may not be significant. Nonetheless, as a conservative approach, site investigation was proposed within LCW (Site K). During the preparation of EIA stage, access to LCW (Site K) for site investigation works was not acquired. This revised Contamination Assessment Plan is prepared to summarize the findings of further site appraisal at LCW (Site K) and supplement the approved CAP by providing updated sampling and testing scheduled based on the current site condition.

2. ENVIRONMENTAL LEGISLATION, STANDARDS AND GUIDELINES

- 2.1 Assessment of land contamination sources shall be conducted in accordance with the approved EIA report, environmental standards and non-statutory guidelines recommended in the approved CAP viz. in general accordance with the requirement stipulated in "*Guidance Note for Contaminated Land Assessment Remediation*" (Guidance Note) issued by Environmental Protection Department (EPD). In addition, the Risk Based Remediation Goals (RBRGs) stipulated in the "*Guidance Manual for Use of Risk-based Remediation Goals for Contamination Management*" (The Guidance Manual) issued by EPD shall also be adopted as the criteria for assessing soil and groundwater contamination.

3. FURTHER SITE INSPECTION AND OBSERVATION

- 3.1 Further site visit to LCW (Site K) was conducted on 30 October 2009 to inspect and ascertain contaminative sources/hotspots. **Figure NOL/ERL/300/C/XRL/ENS/M57/524** shows the existing site condition and works boundary of LCW (Site K).
- 3.2 During the site inspection, all the above-mentioned sites were inspected with photo-documentation. **Table 3.1** summarises the findings of the site inspections and **Figure NOL/ERL/300/C/XRL/ENS/M57/524** illustrate the site layout and proposed location of potential

contamination hotspots for site investigation with the support of photo-documentation. Identification of hotspots was mainly based on latest site observations and information from approved CAP.

Table 3.1 Findings of the Latest Site Inspection

Site ID	Status in Approved CAP	Site Area	Current Status	Site Inspection Results	Site Investigation Proposed?	Drawing Reference
LCW (Site K)	Open Area	300m ²	Same as approved CAP	<p>According to Table 5.4 of the approved CAP in EIA report which summarized the site appraisal results, a chemical storage area was found within Feoso's Building at close proximity to LCW (Site K). The chemical storage area was used for storing dye and was identified as a potential source of contamination to LCW (Site K).</p> <p>Based on site observation on 30 October 2009, the chemical storage area within Feoso's building was still in operation. Over twenty plastic containers were found upon some wooden piles within the storage area. As observed from the surrounding, the chemical storage area was paved with intact concrete without stains. During site inspection, LCW (Site K) was found to be a green area. No significant difference in the layout of Site K and the chemical storage area was found between recent observation and findings of approved EIA.</p> <p>Based on the above, the potential land contamination impact aroused from the chemical storage area is considered as low, however, as a conservative approach, site investigation is still proposed within site K at close proximity to the chemical storage area.</p>	Yes	<p>Figure NOL/ERL/300/C/XRL/ENS/M57/524 (For existing site condition)</p> <p>(Figure NOL/ERL/300/C/XRL/ENS/M57/021 of the approved CAP is extracted and included in this revised CAP for reference of previous site condition)</p>

4. SAMPLING AND TESTING PLAN FOR SITE INVESTIGATION

- 4.1 Based on the findings of further site inspection and information acquired from approved CAP, the sampling location within Site K proposed in Figure NOL/ERL/300/C/XRL/ENS/M57/021 of the approved CAP in EIA Report is still valid for assessment of potential contamination at contamination hotspots and the site condition in general. The proposed sampling locations are illustrated in **Figure NOL/ERL/300/C/XRL/ENS/M57/524**. The selection of potential chemicals of concern (COCs) recommended for laboratory analysis at the proposed sampling location is reference to the nature of present and historical use of each site, the Guidance Note, Guidance Manual and the approved CAP. As recommended in Guidance Note, heavy metals were suggested for assessing the concern of general inorganic contamination. The sampling and testing plan, together with rationales for selecting the sampling locations, are summarized in **Table 4.1**.
- 4.2 The exact sampling locations of the site investigation (SI) shall be determined on site and subject to fine adjustment due to site specific conditions (e.g. locations, presence of foundations, underground utilities, delivery pipes and services).

Table 4.1 Sampling and Testing Plan for LCW (Site K)

Proposed Sampling Location ¹	Sampling Method	Sample Matrix ^{2,3}		Parameters to be Tested ⁴						Rationale
				Petroleum Carbon Ranges	VOC ⁵	SVOC ⁵	Heavy Metals	PCB	Cyanide	
K-01	Borehole	Soil	0.5m BBC	-	X	X	Cd, CrIII,CrVI, Cu, Hg, Ni, Pb, Zn	X	X	In order to assess the potential land contamination impacts due to chemical spillage of chemicals stored at Feoso's building at close proximity to the site, 1 borehole is proposed.
		Soil	1.5m BBC	-	X	X	Cd, CrIII,CrVI, Cu, Hg, Ni, Pb, Zn	X	X	
		Soil	3.0m BBC	-	X	X	Cd, CrIII,CrVI, Cu, Hg, Ni, Pb, Zn	X	X	
		Soil	4.5m BBC	-	X	X	Cd, CrIII,CrVI, Cu, Hg, Ni, Pb, Zn	X	X	Heavy metals commonly found in dyes are included, together with solvents and cyanide.
		Soil	6.0m BBC	-	X	X	Cd, CrIII,CrVI, Cu, Hg, Ni, Pb, Zn	X	X	
		GW	If present [^]	-	X	X	-Hg only	X	-	

Remarks:

1. Locations are shown in **Figures NOL/ERL/300/C/XRL/ENS/M57/524**.

2. BBC= below base of concrete slab; GW=groundwater

3. Exact sampling depth shall be determined on site and subject to fine adjustment due to site specific conditions (e.g. hard rocks or groundwater encountered (if any)).

4. X = testing proposed

5. Since RBRG value of Benzo(a)anthracene Benzo(a)pyrene, Benzo(g,h,i)perylene Benzo(k)fluoranthene Dibenzo(a,h)anthracene and Indeno(1,2,3-cd)pyrene were not available for groundwater, the captioned chemicals parameters would not be tested in groundwater sample.

[^] Samples will only be collected if groundwater is encountered during SI works.

Soil Sampling Method and Depth of Sampling

- 4.3 All soil boring / excavation and sampling should be supervised by a land contamination specialist.
- 4.4 Borehole should be undertaken by means of dry rotary drilling method, i.e. without the use of flushing medium, to prevent cross-contamination during sampling. For safety reasons, an inspection pit should be excavated down to 2.0m below ground to inspect for underground utilities at the proposed borehole location. Considering only surface contaminative works were identified during site appraisal in approved CAP and the information provided by FSD indicated no registered dangerous goods issued at the area with potential land contamination concern (which is considered to imply no registered underground services tanks), sampling is proposed to 6m below base of concrete (BBC). Should contamination identified at 6m based on the laboratory results, sampling at further depths, if necessary, down to the end of excavation levels should be conducted to confirm the vertical extent of contamination.
- 4.5 Disturbed soil samples should be collected at depth of 0.5m and 1.5m BBC. Soil boring using drill rigs should then be performed from depth of 2.0m to the maximum boring depth. Undisturbed samples should be collected at, 3m, 4.5m and 6m BBC to capture the potential contaminated soil. Groundwater sample should be collected (if encountered). The deepest depth of sampling should be of up to 6m below ground. Where there are suspected signs of contamination, extra samples should be taken for laboratory analysis.
- 4.6 At each sampling location/depth, sufficient quantity of soil sample (as specified by the laboratory) should be taken. All soil samples should be uniquely labelled. Backup samples should be retained and stored at 0 - 4 °C in laboratory.

Strata Logging

- 4.7 Strata logging for boreholes should be undertaken during the course of drilling/digging and sampling by a qualified geologist. The logs should include the general stratigraphic description, depth of soil sampling, sample notation and level of groundwater (if encountered). The presence of rocks/boulders/cobbles and foreign materials such as metals, wood and plastics should also be recorded.

Free Product and Groundwater Level Measurement

- 4.8 The thickness of any free product and ground water level if present at sampling locations should be measured with an interface probe. The free product if encountered in sufficient amount should be collected for laboratory analysis to determine the composition.

Groundwater Sampling

- 4.9 It is proposed to collect groundwater samples if groundwater is encountered at the sampling locations.
- 4.10 For each proposed borehole sampling location, a groundwater sampling well should be installed into the boreholes if groundwater is encountered or agreed by the land contamination specialist. A typical design of groundwater monitoring well is shown in **Figure NOL/ERL/300/C/XRL/ENS/M57/500**. After installation of the monitoring wells, the depth to water table at all monitoring wells should be measured at the same time with an interface probe in order to delineate the groundwater table contours at the subject site. Well developments (approximately five well volumes) should be carried out to remove slit and drilling fluid residue from the wells. The wells should then be allowed to stand for a day to permit groundwater conditions to equilibrate. Groundwater level and thickness of free product layer, if present, should be measured at each well before groundwater samples are taken.
- 4.11 Prior to groundwater sampling, the monitoring wells should be purged (at least three well volumes) to remove fine-grained materials and to collect freshly refilled representative groundwater samples.

- 4.12 After purging, one groundwater sample should then be collected at each well using Teflon bailer and decanted into appropriate sample vials or bottles in a manner that minimizes agitation and volatilization of VOCs from the samples. All samples should be uniquely labelled.
- 4.13 Immediately after collection, groundwater samples should be transferred to new, clean, laboratory-supplied glass jars for sample storage/transport. The sampling glass jars should be of "darken" type. Groundwater samples should be placed in the glass jars with zero headspace and promptly sealed with a septum-lined cap. Immediately following collection, samples should be placed in ice chests, cooled and maintained at a temperature of about 4°C until delivered to the analytical laboratory.

Sample Size and Decontamination Procedures

- 4.14 All equipment in contact with the ground should be thoroughly decontaminated between each excavation, drilling and sampling event to minimise the potential for cross contamination. The equipment (including drilling pit, digging tools and soil/groundwater samplers) should be decontaminated by steam cleaning or high-pressure hot water jet, then washed by phosphate-free detergent and finally rinsed by distilled / deionised water.
- 4.15 Prior to sampling, the laboratory responsible for analysis should be consulted on the particular sample size and preservation procedures that are necessary for each chemical analysis.
- 4.16 The sample containers should be laboratory cleaned, sealable, water-tight, made of glass or other suitable materials with aluminium or Teflon-lined lids, so that the container surface will not react with the sample or adsorb contaminants. No headspace should be allowed in the containers which contain samples to be analysed for VOCs, Petroleum Carbons Range or other volatile chemicals.
- 4.17 The containers should be marked with the sampling location codes and the depths at which the samples were taken. If the contents are hazardous, this should be clearly marked on the container and precautions taken during transport. Samples should be stored at between 0-4 °C but never frozen. Samples should be delivered to laboratory within 24 hours of the samples being collected and analysed within the respective retention period but should not more than 10 days.

QA/QC Procedures

- 4.18 QA/QC samples should be collected with reference to the following frequency criteria where appropriate during the SI. Chain of Custody protocol should be adopted.
- 1 duplicate sample per 20 samples for full suite analysis;
 - 1 equipment blank per 20 samples for full suite analysis;
 - 1 field blank per 20 samples for full suite analysis; and
 - 1 trip blank per trip for the analysis of volatile parameters.

Health and Safety

- 4.19 The specific safety measures to be taken depend on the nature and content of contamination, the site conditions and the regulations related to site safety requirements. Workmen Compensation Insurance and third party insurance must be provided for the SI.
- 4.20 Extreme care should be exercised when toxic gases or other hazardous materials are encountered. Any abnormal conditions found shall be reported immediately to the safety officer and the land contamination specialist.
- 4.21 The SI contractor shall establish and maintain a Health and Safety Plan before commencement of the SI that will include the following:

- (a) Instruction of works on work procedures, safe practices, emergency duties, and applicable regulations;
- (b) Regularly scheduled meetings of the workers in which the possible hazards, problems of the job, and related safe practices are emphasized and discussed;
- (c) Good housekeeping practices; and
- (d) Availability of and instruction in the location, use and maintenance of personal protective equipment.

4.22 The SI Contractor shall maintain equipment and supplies reasonably required in an emergency, including lifesaving, evacuation, rescue and medical equipment in good working order and condition at all times. The SI Contractor shall use all reasonable means to control and prevent fires and explosions, injury to personnel and damage to equipment of property. Without limiting the foregoing, the SI Contractor shall:

- (a) Maintain proper safety devices, barriers to minimize hazards during performance of the work;
- (b) Prohibit smoking and open flames and the carrying of matches and lighters;
- (c) Develop and maintain a written emergency plan applicable to the Work and Site;
- (d) Maintain equipment in good operating condition and have emergency and first aid equipment ready for immediate use, where applicable;
- (e) Conduct equipment tests to ensure that equipment is properly placed and in good operating condition, and that workers are able to respond to emergency situations;
- (f) Require all workers employed or retained by the Contractor, or a subcontractor, to at all time wear clothing suitable for existing work, weather and environmental conditions; and
- (g) The personnel are required to wear respirator and gloves for vapour exposure protection, if necessary. Safety helmet and protective boots should be worn.

5. LABORATORY ANALYSIS

5.1 Laboratory analysis is proposed in order to screen the presence of potential contaminants that are of concern at the Study Area. **Table 5.1** summarizes the parameters, the minimum requirement of the reporting limits and reference methods for the laboratory analyses of soil and groundwater samples for this land contamination study.

Table 5.1 Parameters, Detection Limits and Reference Methods for Laboratory Analyses

Item	Parameter	Soil		Groundwater	
		Detection limits (mg/kg) or otherwise stated	Reference Method	Detection limits (µg/L) or otherwise stated	Reference Method*
VOCs					
1	Acetone	50	HOKLAS accredited In-house method EP074 (reference method: USEPA 8260B)	500	HOKLAS accredited In-house method EP074 (reference method: USEPA 8260B)
2	Benzene	0.2		5	
3	Bromodichloromethane	0.5		5	
4	2-Butanone	5		50	
5	Chloroform	0.5		5	
6	Ethylbenzene	0.5		5	
7	Methyl tert-Butyl Ether	0.5		5	
8	Methylene Chloride	5		50	
9	Styrene	0.5		5	
10	Tetrachloroethene	0.5		5	
11	Toluene	0.5		5	
12	Trichloroethene	0.5		5	
13	Xylenes (Total)	1.5		15	
SVOCs					
14	Acenaphthene	0.5	HOKLAS accredited In-house method EP075 (reference method: USEPA 8270D)	2	HOKLAS accredited In-house method EP075 (reference method: USEPA 8270D)
15	Acenaphthylene	0.5		2	
16	Anthracene	0.5		2	
17	Benzo(a)anthracene	0.5		NA	
18	Benzo(a)pyrene	0.5		NA	
19	Benzo(b)fluoranthene & Benzo(k)fluoranthene	1.0		4	
20	Benzo(g,h,i)perylene	0.5		NA	
21	bis-(2-Ethylhexyl) phthalate	5.0		NA	
22	Chrysene	0.5		1	
23	Dibenzo(a,h)anthracene	0.5		NA	
24	Fluoranthene	0.5		2	

Item	Parameter	Soil		Groundwater	
		Detection limits (mg/kg) or otherwise stated	Reference Method	Detection limits (µg/L) or otherwise stated	Reference Method*
25	Fluorene	0.5		2	
26	Hexachlorobenzene	0.2		4	
27	Indeno(1,2,3-cd)pyrene	0.5		NA	
28	Naphthalene	0.5		2	
29	Phenanthrene	0.5		2	
30	Phenol	0.5		NA	
31	Pyrene	0.5		2	
Metals					
32	Chromium III	1	HOKLAS accredited In-house method EG025 (reference method: APHA 2500Cr:B)	NA	HOKLAS accredited In-house method EG025 (reference method: APHA 2500Cr:B)
33	Chromium VI	1		NA	
34	Cadmium	0.2	HOKLAS accredited In-house method EG020 (reference method: USEPA 6020)	NA	HOKLAS accredited In-house method EG020 (reference method: USEPA 6020)
35	Copper	1		NA	
36	Nickel	1		NA	
37	Lead	1		NA	
38	Zinc	1		NA	
39	Mercury	0.2	HOKLAS accredited In-house method EG035 (reference method: APHA 3112B)	0.5	HOKLAS accredited In-house method EG035 (reference method: APHA 3112B)
PCB					
40	PCB	0.1	HOKLAS accredited In-house method EP066 (reference method: USEPA 8270D)	0.2	HOKLAS accredited In-house method EP066 (reference method: USEPA 8270D)
Other Inorganic Compounds					
41	Cyanide, free	1	HOKLAS accredited In-house method EK026MD (reference method: APHA 4500CN C, N)	NA	HOKLAS accredited In-house method EK026MD (reference method: APHA 4500CN C, N)

Notes:
NA= Not Applicable

- 5.2 For sampling and laboratory analyses, chain of custody procedure should be included as QA/QC procedure.
- 5.3 All laboratory analyses for soil and groundwater samples should be conducted by a Hong Kong Laboratory Accreditation Scheme (HOKLAS) accredited laboratory. All laboratory test methods should be accredited by the HOKLAS or one of its Mutual Recognition Arrangement partners.
- 5.4 Extra soil samples shall be stored at 0-4 °C and tested for Toxicity Characteristics Leaching Procedure (TCLP) before submission of Remediation Action Plan (RAP) if excavation and landfill disposal is identified as the last resort.
- 5.5 The criteria are set primarily in terms of TCLP limits shown in **Table 5.2**.

Table 5.2 Laboratory Testing Requirements for TCLP Analysis

Parameter	Test Methods*	Detection limit (mg/L)	Landfill Disposal Criteria TCLP Limit (ppm)
TCLP Leachate Preparation allowed by analysis for:			
Antimony (Sb)	USEPA 1311 and 6020A	2	150
Arsenic (As)		2	50
Barium (Ba)		2	1,000
Beryllium (Be)		1	10
Cadmium (Cd)		1	10
Chromium (Cr)		1	50
Copper (Cu)		2	250
Lead (Pb)		3	50
Nickel (Ni)		1.5	250
Selenium (Se)		0.2	1
Silver (Ag)		2	50
Thallium (Tl)		1	50
Tin (Sn)		2.5	250
Vanadium (V)		4	250
Zinc (Zn)		10	250
Mercury (Hg)		0.2	1

* Equivalent internationally recognized standard methods could also be used.

6. INTERPRETATION OF RESULTS

6.1 With reference to the *Guidance Note for Contaminated Land Assessment and Remediation*, interpretation of results shall be based on the comparison with the Risk-based Remediation Goals (RBRGs) as stipulated in Table 2.1 and Table 2.2 of the Guidance Manual.

6.2 The RBRGs are developed based on a risk assessment approach to suit the local environmental conditions and community needs in Hong Kong. Decisions on contaminated soil and groundwater remediation are based on the nature and extent of the potential risks that are posed to human receptors as a result of exposure to chemicals in the soil and/or groundwater. Four types of land use scenarios are set under RBRGs to reflect the typical *physical settings in Hong Kong under which people could be exposed to contaminated soil and groundwater*. A description of each land use is as follows:

- Urban residential – Sites located in an urban area where main activities involve habitation by individuals. The typical physical setting is a high rise residential building situated in a housing estate that has amenity facilities such as landscaped yards and children's playgrounds. The receptors are residents who stay indoors most of the time except for a short period each day, during which they are outdoors and have the chance of being in direct contact with soil at landscaping or play areas within the estate.
- Rural residential – Sites located in a rural area where the main activities involve habitation by individuals. These sites typically have village-type houses or low rise residential blocks surrounded by open space. The receptors are rural residents who stay at home and spend some time each day outdoors on activities such as gardening or light sports. The degree of contact with the soil under the rural setting is more than that under the urban setting both in terms of the intensity and frequency of contact.
- Industrial – Any site where activities involve manufacturing, chemical or petrochemical processing, storage of raw materials, transport operations, energy production or transmission,

etc. Receptors include those at sites where part of the operation is carried out directly on land and the workers are more likely to be exposed to soil than those working in multi-storey factory buildings.

- Public parks – Receptors include individuals and families who frequent parks and play areas where there is contact with soil present in lawns, walkways, gardens and play areas. Parks are considered to be predominantly hard covered with limited areas of predominantly landscaped soil. Furthermore, public parks are not considered to have buildings present on them.

6.3 In addition to the RBRGs, screening criteria (soil saturation limits, Csat, developed for Non-aqueous Phase Liquid [NAPL] in soil and water solubility limits for NAPL in groundwater) for the more mobile organic chemicals must be considered to determine whether a site requires further action.

6.4 Since future land uses of the areas within this project area of industrial use or railway development, RBRGs (industrial) should be adopted for this land contamination assessment. Relevant soil and groundwater RBRGs level for this land contamination study including the soil saturation limit and solubility limit are presented in the following table. Should the future land uses of any of the areas within this project be changed, re-testing and, if necessary, remediation works, should be conducted in accordance to relevant RBRG.

Table 6.1 Relevant RBRGs for Soil and Groundwater - Industrial

Chemical	Soil (mg/kg)		Groundwater (µg/L)	
	RBRGs for Industrial	Soil Saturation Limits	RBRGs for Industrial	Solubility Limits
VOCs				
Acetone	10,000	***	10,000,000	***
Benzene	9.21	336	54,000	1,750,000
Bromodichloromethane	2.85	1,030	26,200	6,740,000
2-Butanone	10,000	***	10,000,000	***
Chloroform	1.54	1,100	11,300	7,920,000
Ethylbenzene	8,240	138	10,000,000	169,000
Methyl tert-Butyl Ether	70.1	2,380	1,810,000	***
Methylene Chloride	13.9	921	224,000	***
Styrene	10,000	497	10,000,000	310,000
Tetrachloroethene	0.777	97.1	2,950	200,000
Toluene	10,000	235	10,000,000	526,000
Trichloroethene	5.68	488	14,200	1,100,000
Xylenes (Total)	1,230	150	1,570,000	175,000
SVOCs				
Acenaphthene	10,000	60.2	10,000,000	4,240
Acenaphthylene	10,000	19.8	10,000,000	3,930
Anthracene	10,000	2.56	10,000,000	43.4
Benzo(a)anthracene	91.8	NA	NA	NA
Benzo(a)pyrene	9.18	NA	NA	NA
Benzo(b)fluoranthene	17.8	NA	7,530	1.5

Chemical	Soil (mg/kg)		Groundwater (µg/L)	
	RBRGs for Industrial	Soil Saturation Limits	RBRGs for Industrial	Solubility Limits
Benzo(g,h,i)perylene	10,000	NA	NA	NA
Benzo(k)fluoranthene	918	NA	NA	NA
bis-(2-Ethylhexyl)phthalate	91.8	NA	NA	NA
Chrysene	1,140	NA	812,000	1.6
Dibenzo(a,h)anthracene	9.18	NA	NA	NA
Fluoranthene	10,000	NA	10,000,000	206
Fluorene	10,000	54.7	10,000,000	1,980
Hexachlorobenzene	0.582	NA	695	6,200
Indeno(1,2,3-cd)pyrene	91.8	NA	NA	NA
Naphthalene	453	125	862,000	31,000
Phenanthrene	10,000	28	10,000,000	1000
Phenol	10,000	7,260	NA	NA
Pyrene	10,000	NA	10,000,000	135
Metals				
Cadmium	653	NA	NA	NA
Chromium III	10,000	NA	NA	NA
Chromium VI	1,960	NA	NA	NA
Copper	10,000	NA	NA	NA
Lead	2,290	NA	NA	NA
Mercury	38.4	NA	6,790	NA
Nickel	10,000	NA	NA	NA
Zinc	10,000	NA	NA	NA
PCB				
PCB	0.748	NA	5,110	31
Other Inorganic Compound				
Cyanide, Free	10,000	NA	NA	NA

Note: NA - Not Available

*** indicates that the Csat value/ solubility limit exceeds the 'ceiling limit' therefore the RBRG applies

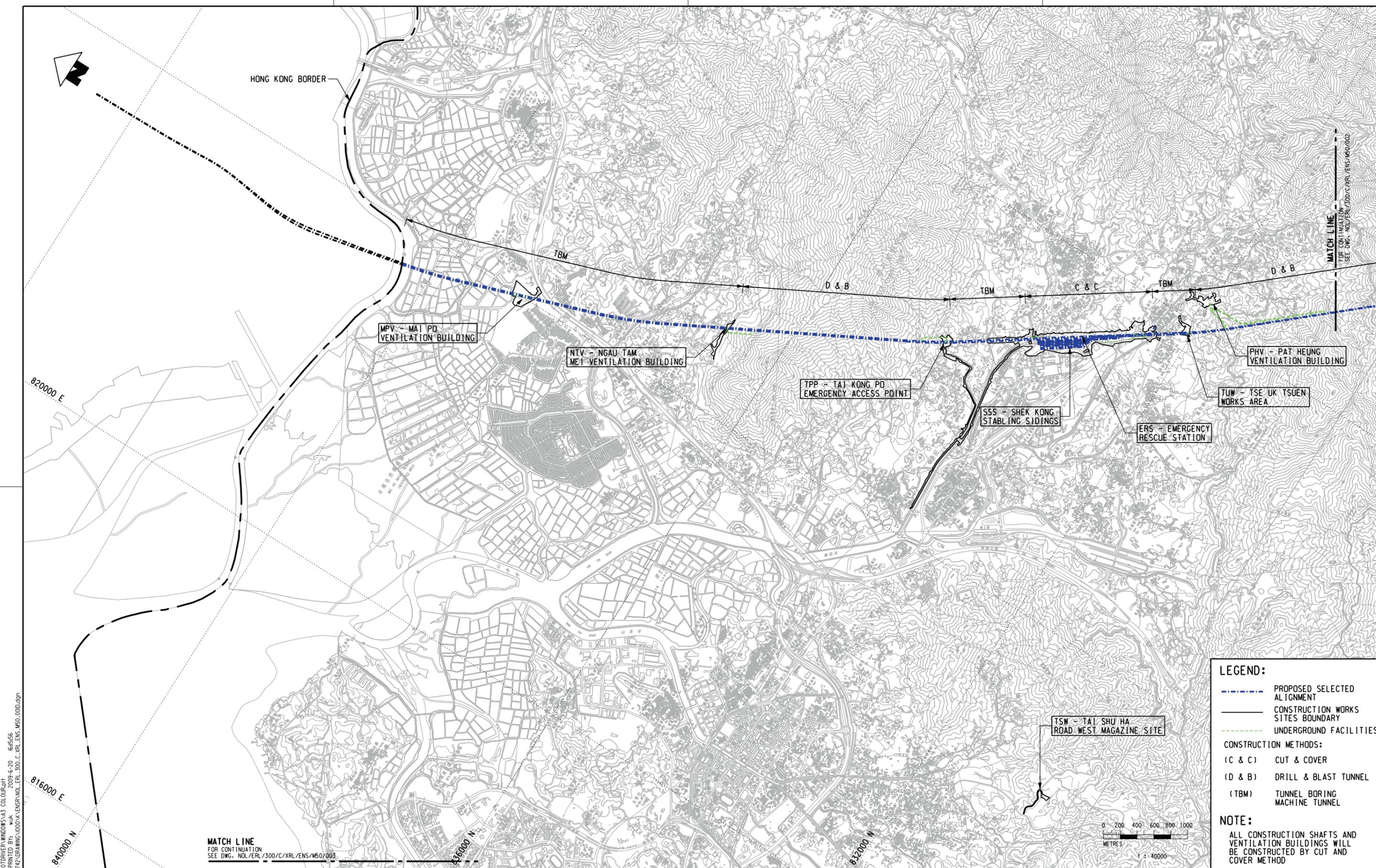
7. REPORTING

- 7.1 After completion of the site investigation, a supplementary CAR which reports the detailed methodology of site investigation, assessment criteria, on-site observations and the analytical results from the site investigation works, will be submitted to EPD for endorsement.
- 7.2 If land contamination is confirmed within the works areas, a supplementary Remediation Action Plan (RAP) which formulates remedial measures should be submitted to EPD for endorsement. The contaminated site should be cleaned up according to the approved supplementary RAP and a supplementary Remediation Report (RR) to demonstrating completion of remedial actions should be

prepared and submitted to EPD for endorsement prior to the commencement of construction works within the contaminated site.

prepared and submitted to EPD for endorsement prior to the commencement of construction works within the contaminated site.

Figures



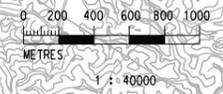
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REV: 2009-6-20 16:55:56
 PRINTED BY: WUK
 DATE: 2009-6-20 16:55:56

REV

REV	DESCRIPTION	BY	DATE	APPROVED	REV	DESCRIPTION	BY	DATE	APPROVED

MATCH LINE
FOR CONTINUATION
SEE DWG. NOL/ERL/300/C/XRL/ENS/M50/003



LEGEND:

- - - - PROPOSED SELECTED ALIGNMENT
- CONSTRUCTION WORKS SITES BOUNDARY
- - - - UNDERGROUND FACILITIES

CONSTRUCTION METHODS:

- (C & C) CUT & COVER
- (D & B) DRILL & BLAST TUNNEL
- (TBM) TUNNEL BORING MACHINE TUNNEL

NOTE:
ALL CONSTRUCTION SHAFTS AND VENTILATION BUILDINGS WILL BE CONSTRUCTED BY CUT AND COVER METHOD

DRAWN	GXH
DESIGNED	TWF
CHECKED	KCC
APPROVED	PL
DATE	19/AUG./2008

EXPRESS RAIL LINK

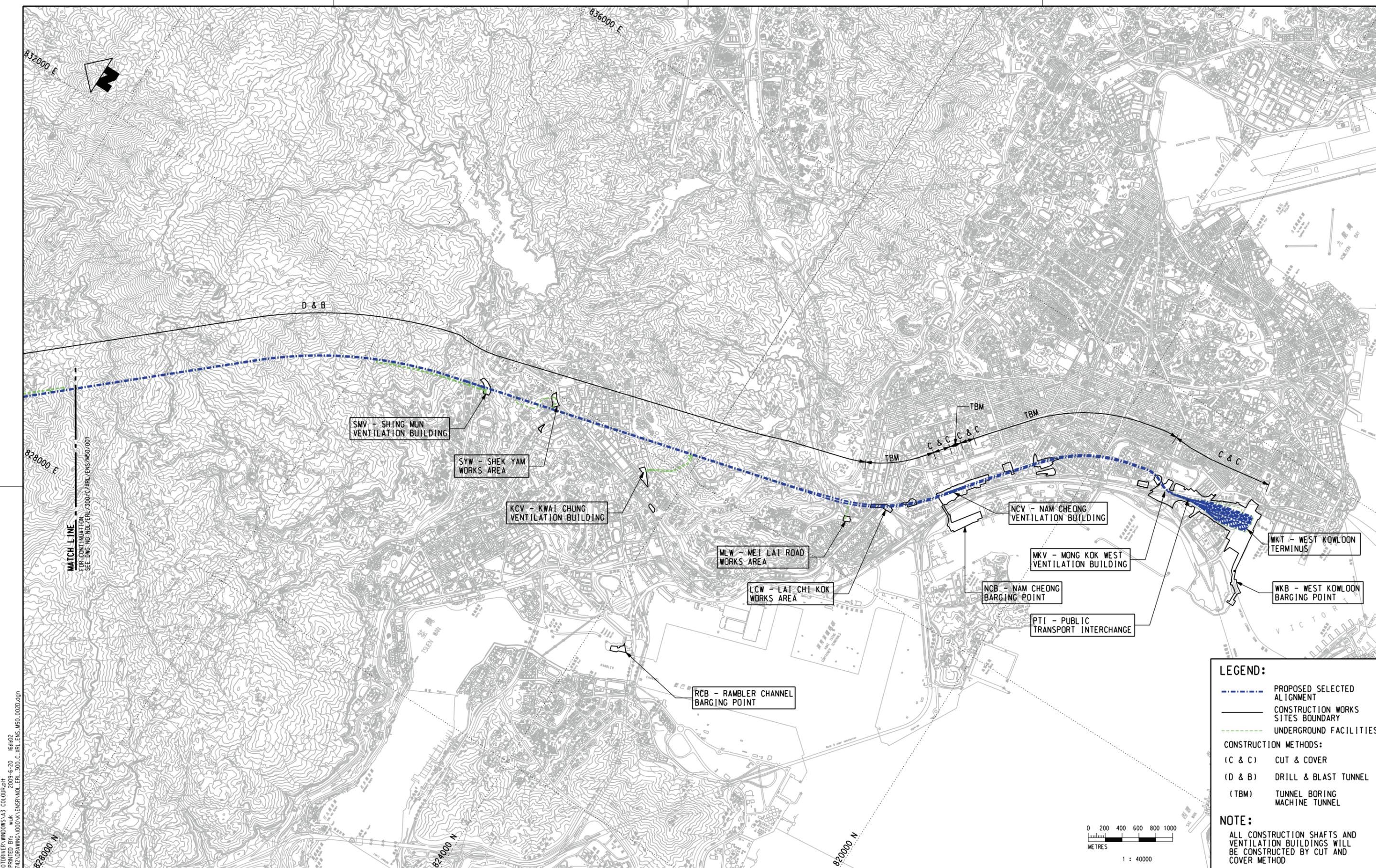
ORIGINATOR

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CADD REF. NOL_ERL_300_C_XRL_ENS_M50_0010.dgn

TITLE
 NOL / ERL-300
 ENVIRONMENTAL IMPACT ASSESSMENT
 OVERALL VIEW OF ALIGNMENT

SCALE 1 : 40000 (A3) **FIGURE NO.** NOL/ERL/300/C/XRL/ENS/M50/001 **REV.** D



LEGEND:

- PROPOSED SELECTED ALIGNMENT
- CONSTRUCTION WORKS
- SITES BOUNDARY
- UNDERGROUND FACILITIES

CONSTRUCTION METHODS:

- (C & C) CUT & COVER
- (D & B) DRILL & BLAST TUNNEL
- (TBM) TUNNEL BORING MACHINE TUNNEL

NOTE:

ALL CONSTRUCTION SHAFTS AND VENTILATION BUILDINGS WILL BE CONSTRUCTED BY CUT AND COVER METHOD

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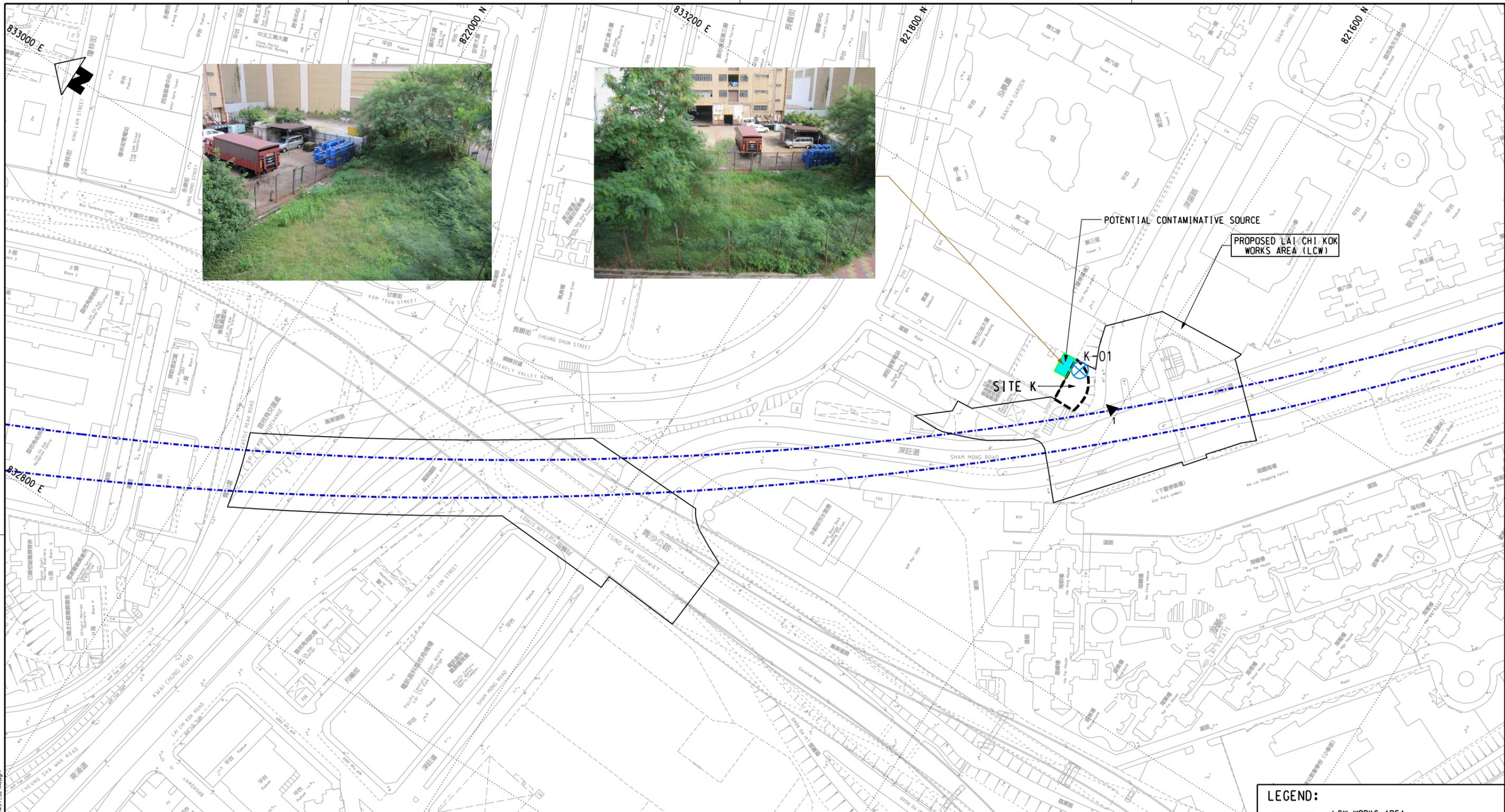
REV	DESCRIPTION	BY	DATE	APPROVED	REV	DESCRIPTION	BY	DATE	APPROVED

DRAWN	GXH
DESIGNED	TWF
CHECKED	KCC
APPROVED	PL
DATE	19/AUG./2008

EXPRESS RAIL LINK

ORIGINATOR
 CADD REF. NOL_ERL_300_C_XRL_ENS_M50_002D.dgn

TITLE		NOL / ERL-300	
ENVIRONMENTAL IMPACT ASSESSMENT		OVERALL VIEW OF ALIGNMENT	
SCALE	FIGURE NO.	REV.	
1 : 40000 (A3)	NOL/ERL/300/C/XRL/ENS/M50/002	D	

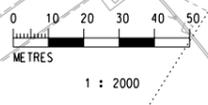


SITE ID	POTENTIAL CONTAMINATIVE LAND USES IDENTIFIED IN APPROVED CAP	CURRENT LAND USES	HOTSPOTS IDENTIFIED	APPROXIMATE AREA OF THE SITE / AREA OF CONTAMINATIVE ACTIVITIES	TOTAL NUMBER OF SAMPLING POINT(S) PROPOSED WITHIN THE SITE
K	OPEN AREA- CHEMICAL STORAGE AREA NEXT TO LCW	SAME AS APPROVED CAP	NA	300m ² / NA*	1**

NOTE:
 SITE LAYOUT IS INDICATIVE ONLY.
 * POTENTIAL CONTAMINATIVE AREA FOR THE CHEMICAL STORAGE AREA AT FEOSO BUILDING.
 ** SI IS PROPOSED AS A CONSERVATIVE APPROACH TO ASSESS THE IMPACT FROM NEARBY CHEMICAL STORAGE AREA TO THE LCW WORKS AREA.

LEGEND:

- LCW WORKS AREA
- PROPOSED ALIGNMENT
- SITE FOR FURTHER ASSESSMENT
- POTENTIAL CONTAMINATIVE SOURCE
- DIRECTION OF PHOTO TAKEN
- E-01 PROPOSED SAMPLING LOCATION



PLOT DRW: F:\nst\set\mtr\p\otriver\windows\13\colour.dwg 14/10/2009 11:18
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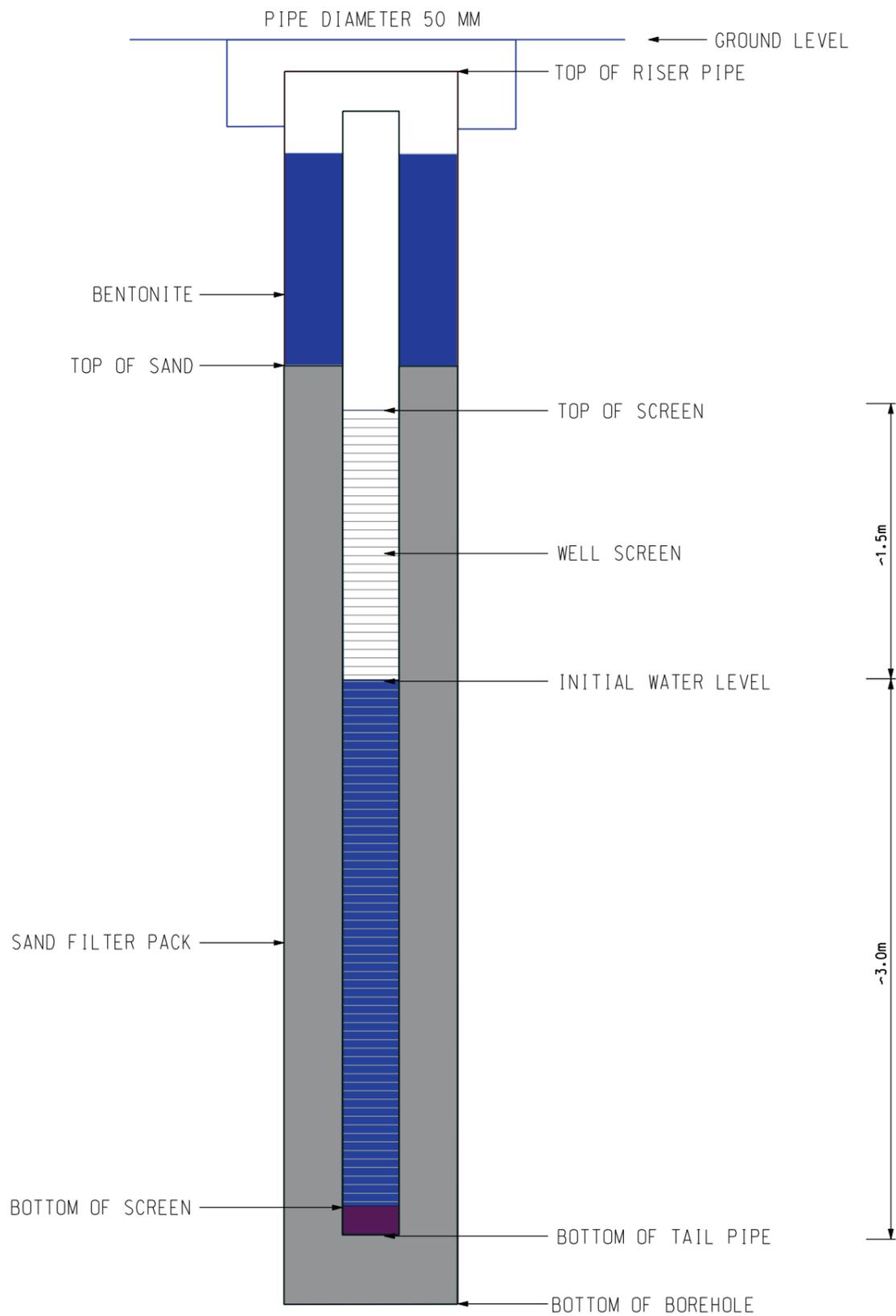
DRAWN	YJP
DESIGNED	TWF
CHECKED	KCC
APPROVED	PL
DATE	21/SEP./2009

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AECOM
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 CADD REF. NOL_ERL_300_C_XRL_ENS_M57_524A.dgn

TITLE
NOL / ERL-300
 REVISED CAP FOR LCW AND WKT WORKS AREA
 SITE LAYOUT PLAN OF LCW

SCALE 1 : 2000 (A3) FIGURE NO. NOL/ERL/300/C/XRL/ENS/M57/524 REV. A



PLOT DIR: R:\ustmshet\MTR\PILOTDRIVER\WINDOWS\33 COLOUR.ppt
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REV	DESCRIPTION	BY	DATE	APPROVED	REV	DESCRIPTION	BY	DATE	APPROVED

DRAWN	LC
DESIGNED	TWF
CHECKED	KCC
APPROVED	PL
DATE	26/JUL/2008


EXPRESS RAIL LINK

 ORIGINATOR
 CADD REF. NOL_ERL_300_C_XRL_ENS_M57_500A.dgn

TITLE		NOL / ERL-300 REVISED CAP FOR MPV WORKS AREA TYPICAL DESIGN OF GROUNDWATER SAMPLING WELL	
SCALE	FIGURE NO.	REV.	
N.T.S.	NOL/ERL/300/C/XRL/ENS/M57/500	A	