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**ENVIRONMENTAL MANAGEMENT STUDIES ON THE RE-
ALIGNED ROAD CONSTRUCTION AT KUALA KUBU BHARU**

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ABSTRACT

This research includes interview, site observation, compliance audit and monitoring programs carried out on the re-aligned road FR55 (KKB – Fraser Hill) at Kuala Kubu Bharu. The project proponent SPLASH, is involved in the construction works of the said re-aligned road. Environmental audit was carried out on-site, as well as through a management review exercise on the overall management of SPLASH. Significant impacts on the environment, which are associated with the construction activities, were identified during the audit. There are degradation of natural resources, deterioration of water quality, siltation, sedimentation, air pollution, noise pollution, ground vibration, soil contamination, life hazard and human health. Nevertheless, the management of SPLASH had recommended and implemented effective and practical mitigation measures to abate the environmental impacts identified, which included mitigation measures on the management of soil erosion, river water quality, hazardous materials, waste, wastewater, air quality, noise and vibration, monitoring programs, transportation and machinery, occupational safety and health. Monitoring programs showed that all the river water quality, air quality, noise & vibration quality complied with the DOE's requirements except for a few number of silt traps discharge quality. In this study, a preliminary EMS in line with the principles of ISO 14001 was planned and implemented at the project site. The commitment and support from all levels of staffs, environmental training programs, fund allocation for implementation of EMS, and external consultant (to conduct auditing and monitoring) are essential to ensure EMS is smoothly implemented. As a result, the formulation and implementation of a preliminary EMS had the potential to reduce

environmental impacts on road construction and enhanced its management system in order to achieve an environmentally sustainable development manner. Preliminary EMS framework is a suitable pathway for the certification of ISO 14001 in road construction industry.

ABSTRAK

Kajian ini merangkumi temuramah, pemerhatian tapak, audit pematuhan dan program-program pemantauan telah dijalankan ke atas penjarangan jalan FR55 (KKB-Fraser Hill) di Kuala Kubu Bharu. Penaja projek, SPLASH adalah pihak yang terlibat dengan kerja-kerja pembinaan penjarangan jalan tersebut. Audit alam sekitar telah dijalankan di tapak kerja dan juga melalui kajian semula pengurusan terhadap pengurusan SPLASH secara keseluruhan. Impak-impak yang berkesan ke atas alam sekitar akibat daripada aktiviti-aktiviti pembinaan telah dikenal pasti semasa audit dijalankan seperti berkurangnya sumber-sumber semulajadi, penurunan dalam kualiti air, perlonggokan lumpur, pemendapan, pencemaran udara, pencemaran bunyi, gegaran bumi, pencemaran tanah, bahaya kepada nyawa dan juga kesihatan manusia. Walaubagaimana pun, pihak pengurusan SPLASH telah mencadangkan dan melaksanakan langkah-langkah yang berkesan dan praktikal bagi mengurangkan kesan-kesan terhadap alam sekitar seperti yang telah dibangkitkan termasuk kaedah-kaedah pencegahan melalui pengurusan terhadap hakisan tanah, kualiti air sungai, bahan-bahan merbahaya, bahan buangan, bahan buangan bercecair, kualiti udara, bunyi dan gegaran, program pemantauan, pengangkutan dan mesin-mesin, keselamatan dan kesihatan. Program pemantauan menunjukkan semua keputusan pemantauan dari segi kualiti air sungai, kualiti udara, kualiti bunyi & gegaran, adalah mematuhi syarat-syarat JAS kecuali beberapa kualiti pelepasan kolam perangkap. Di dalam kajian ini, EMS permulaan yang selari dengan prinsip-prinsip ISO 14001 telah dirancang dan dijalankan di tapak projek. Komitmen dan sokongan daripada semua peringkat pekerja-pekerja, program-program latihan alam sekitar, peruntukan kewangan bagi melaksanakan EMS dan perunding luar (untuk

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ABBREVIATIONS

AN	Ammoniacal nitrogen
ACI	Air Curtain Incinerator
APHA	American Public Health Association
BOD	Biochemical oxygen demand
CEO	Chief executive officer
Ch	Chainage
CIBD	Construction Industry Development Board
CLQ	Center Labour Quarters
CM	Construction Manager
COD	Chemical oxygen demand
DESEJV	Dunia Epik & Spring Energy –JV
DID	Drainage and Irrigation Department
DO	Dissolved oxygen
DOE	Department of Environment
DOE	Department of Environment
EA & RI	Environmental Auditing & Related Environmental Investigations
EIA	Environmental Impacts Assessment
EL	Environmental Labels and Declarations
EMC	Environmental Management Consultant
EMP	Environmental Management Plan

EMS	Environmental Management Systems
EPE	Environmental Performance Evaluation
EQA	Environmental Quality Act
ERP	Emergency Response Procedures
FR55	Federal Route 55
GESB	Gamuda Engineering Sdn Bhd
GKTJV	Gamuda-KDEB-TSWA-JV
H/Q	Headquarters
ICC	International Chamber of Commerce
ICP	Inductively Coupled Plasma
ISO	International Organization for Standardization
JKR	Public Works Department Malaysia
KDEB	Kumpulan Darul Ehsan Sdn Bhd
Kg.	Kampung
KKB	Kuala Kubu Bharu
LCA	Life Cycle Assessment
LHS	left hand side
MSSB	Magah Sewa Sdn Bhd
NACES	National Committee on Environmental Standards
NCR	Non-compliance Record
O&G	Oil and Grease
POC	Probability of Occurrence
PPE	Personnel Protection Equipment

PPE 1	“Pematuhan Perlaksanaan EIA 1”
RM	Ringgit Malaysia
SAGE	Strategic Advisory Group on Environment
SEO	Senior Environmental Officer
Sg	Sungai
SH	Section Head
SIE	Site Independent Environmentalist
SIRIM	Standards and Industrial Research Institute of Malaysia
SMHB	Syed Muhammad Hooi and Binnie Sdn Bhd
SOC	Severity of Consequences
SPLASH	Syarikat Pengeluar Air Sungai Selangor Sdn Bhd
SPM	Senior Project Manager
T&D	Terms and Definition
TC207	Technical Committee 207
TSS	Total Suspended Solids
TSWA	The Sweet Water Alliance
UN	United Nation
UNCED	United Nations Committee on Environmental and Development
UPM	University Putra Malaysia
US EPA	United States Environmental Protection Agency
WICEM II	World Industry Conference on Environmental Management