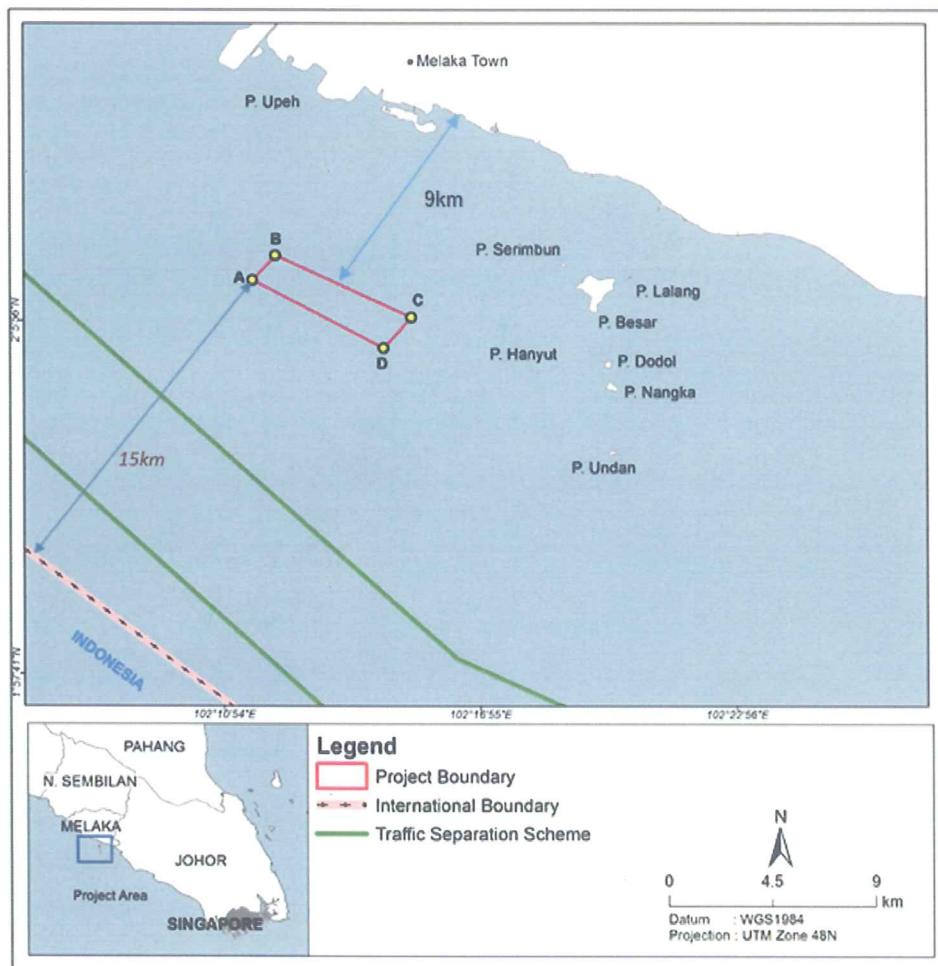


ENVIRONMENTAL IMPACT ASSESSMENT REPORT



PERMOHONAN MELOMBONG PASIR DI BAWAH SEKSYEN 4, AKTA PELANTAR BENUA 1966, P.U. 2006, DI KAWASAN LUAR PERAIRAN NEGERI MELAKA



FIRST SCHEDULE

ENVIRONMENTAL IMPACT ASSESSMENT REPORT

PERMOHONAN MELOMBONG PASIR DI BAWAH SEKSYEN 4,
AKTA PELANTAR BENUA 1966, P.U. 2006, DI KAWASAN LUAR
PERAIRAN NEGERI MELAKA

Prepared For

KAJ DEVELOPMENT SDN BHD

By

LI ENVIRONMENTAL CONSULTANTS SDN BHD

JULY 2017

Your Ref:

Our Ref: KAJD/JAS/300617

Date: 30th June 2017

Pengarah
Jabatan Alam Sekitar Negeri Melaka
Tingkat 3, Bangunan Graha Maju,
Jalan Graha Maju,
75300 Melaka.

Dear Sir,

RE: LETTER OF UNDERTAKING BY KAJ SDN BHD

I hereby certify that all the information contained in the Environmental Impact Assessment report entitled:

PERMOHONAN MELOMBONG PASIR DI BAWAH SEKSYEN 4, AKTA PELANTAR BENUA 1966, P.U. 2006, DI KAWASAN LUAR PERAIRAN NEGERI MELAKA

is true and that the consulting company appointed, **LI Environmental Consultants Sdn Bhd**, has conducted the study for preparation of the said report, based on information provided by our company.

I am aware of all the contents in the EIA report, including all the mitigating and control measures recommended. In this context, we will do our best to implement all the recommendations proposed in order to minimize adverse impacts to the environment, and will observe all requirements and regulation that will be imposed.

Thank You.

Yours Sincerely,



HASBULLAH BIN ZAKARIA
GENERAL MANAGER

S.K.: Ketua pengarah,
Jabatan Alam Sekitar
Kementerian Sumber Asli Dan Alam Sekitar,
Aras 1-4, Podium Blok 2 & 3,
Lot 4G3, Presint 4,
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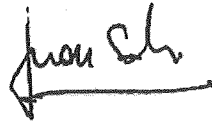
B. DECLARATION FROM EIA STUDY TEAM MEMBERS

**PERMOHONAN MELOMBONG PASIR DI BAWAH SEKSYEN 4, AKTA PELANTAR BENUA 1966, P.U.
2006, DI KAWASAN LUAR PERAIRAN NEGERI MELAKA**

I declare the following:

- (i) I have conducted the study professionally using acceptable methodologies;
- (ii) The study findings are correct to the best of my knowledge; and have not been altered in any manner;
- (iii) The mitigating measures proposed (whenever relevant) to the best of my knowledge are reliable, practical and adequate to comply with the relevant legal requirements; and
- (iv) I shall be accountable for any misleading information in any part of this report.

Signature

: 

Name

: Dr. Juan C. Savioli

Position

: Subject Specialist, SS 0371

Date

: 30 June 2017

B. DECLARATION FROM EIA STUDY TEAM MEMBERS

**PERMOHONAN MELOMBONG PASIR DI BAWAH SEKSYEN 4, AKTA PELANTAR BENUA 1966, P.U.
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- (iii) The mitigating measures proposed (whenever relevant) to the best of my knowledge are reliable, practical and adequate to comply with the relevant legal requirements; and
- (iv) I shall be accountable for any misleading information in any part of this report.

Signature

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Position

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: 30 June 2017

B. DECLARATION FROM EIA STUDY TEAM MEMBERS

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2006, DI KAWASAN LUAR PERAIRAN NEGERI MELAKA**

I declare the following:

- (i) I have conducted the study professionally using acceptable methodologies;
- (ii) The study findings are correct to the best of my knowledge; and have not been altered in any manner;
- (iii) The mitigating measures proposed (whenever relevant) to the best of my knowledge are reliable, practical and adequate to comply with the relevant legal requirements; and
- (iv) I shall be accountable for any misleading information in any part of this report.

Signature

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Name

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Position

: Subject Specialist, SS 0698

Date

: 30 June 2017

B. DECLARATION FROM EIA STUDY TEAM MEMBERS

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2006, DI KAWASAN LUAR PERAIRAN NEGERI MELAKA**

I declare the following:

- (i) I have conducted the study professionally using acceptable methodologies;
- (ii) The study findings are correct to the best of my knowledge; and have not been altered in any manner;
- (iii) The mitigating measures proposed (whenever relevant) to the best of my knowledge are reliable, practical and adequate to comply with the relevant legal requirements; and
- (iv) I shall be accountable for any misleading information in any part of this report.

Signature

: 

Name

: Mohd Edros Zubir

Position

: Assistant Consultant, AC0837

Date

: 30 June 2017

C. DECLARATION FROM EIA STUDY TEAM LEADER

**PERMOHONAN MELOMBONG PASIR DI BAWAH SEKSYEN 4, AKTA PELANTAR BENUA 1966, P.U.
2006, DI KAWASAN LUAR PERAIRAN NEGERI MELAKA**

I declare the following:

- (i) I have read and checked the content of this EIA report;
- (ii) My study team members have conducted the study professionally using acceptable methodologies;
- (iii) The study findings are correct to the best of my knowledge; and have not been altered in any manner;
- (ii) The mitigating measures proposed (whenever relevant) to the best of my knowledge are reliable, practical and adequate to comply with the relevant legal requirements; and
- (iv) Myself and my team shall be accountable for any misleading information in any part of this report

Signature:



Official Stamp:



Name: Dato' Dr Zubir bin Din

IC No / Passport: 500922-07-5495

Position: EIA Study Team Leader, CO 011

Date : 30 June 2017

D. DECLARATION FROM PROJECT INITIATOR

**PERMOHONAN MELOMBONG PASIR DI BAWAH SEKSYEN 4, AKTA PELANTAR BENUA 1966, P.U.
2006, DI KAWASAN LUAR PERAIRAN NEGERI MELAKA**

I declare the following:

- (i) I have provided correct and relevant information to the EIA Study Team;
- (ii) I have allowed the EIA Study Team to conduct the EIA study professionally and independently;
- (iii) I have read and understood the content of the EIA Report;
- (iv) I agree to implement all mitigating measures proposed in this EIA report; and
- (iv) I understand that additional mitigating measures may also be imposed by Department of Environment Malaysia; should the original mitigating measures proposed in this EIA report found not to be adequate to comply with the relevant legal requirements.

Signature:



Official Stamp:



Name: Hasbullah Bin Zakaria

IC/ Passport: 620801-03-5025

Position: General Manager

Date: 30 June 2017

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GLOSSARY

CMT	Crisis Management Team
DID	Department of Irrigation and Drainage
DO	Dissolve Oxygen
DOE	Department of Environment
ECP	Event Contingency Plan
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EQA	Environmental Quality Act 1974
ERP	Emergency Response Plan
ERT	Emergency Response Team
GPS	Global Positioning System
MMD	Malaysian Meteorological Department
MMWQS	Malaysia Marine Water Quality Standards
MSL	Mean Sea Level
PPE	Personnel Protective Equipment
TSHD	Trailer Suction Hopper Dredger
TSS	Total Suspended Solids



**EXECUTIVE
SUMMARY**

EXECUTIVE SUMMARY

1.0 INTRODUCTION

1.1 Project Title

This Environmental Assessment Report has been prepared for the proposed project entitled “**PERMOHONAN MELOMBONG PASIR DI BAWAH SEKSYEN 4, AKTA PELANTAR BENUA 1966, P.U 2006 DI KAWASAN LUAR PERAIRAN NEGERI MELAKA**” by KAJ Development Sdn Bhd.

1.2 Project Proponent

The Project Proponent is **KAJ Development Sdn Bhd** (Co. No. 758258). The proponent can be contacted at the following address:-

KAJ Development Sdn. Bhd.
No 1, Jalan Baiduri 2,
Taman Pulau Melaka,
75000 Melaka.

Contact Person : **En. Hasbullah Zakaria**
(General Manager)
Tel. : 06 232 1226
Fax : 06 233 2923

1.3 EIA Consultant

L I Environmental Consultants Sdn Bhd (Co. No. 656407-P), was appointed by the project proponent to carry out the EIA study and to prepare the EIA Report for submission to the Melaka State Department of Environment. The EIA consultant can be contacted at the following address:

L I Environmental Consultants Sdn Bhd
723 V2, Vanda Business Park
Jalan Sungai Dua
11700 Pulau Pinang.

Contact Person : **Prof (R) Dato' Dr. Zubir bin Din**
(Managing Director, DOE Registration C0011)
Tel. : 04 660 5404
HP : 012 4040 353
Fax. : 04 660 5401

2.0 PROJECT DESCRIPTION

Figure ES1 shows the location of the proposed sand concession site and the coordinates given in Table ES1. The site is located approximately nine (9) km from the coast of Melaka. There are two sensitive receptors within the 10 km radius of the project site, namely the coral habitats around Pulau Besar and the turtle nesting sites on Pulau Upeh. In addition, due to their ecological importance, the corals around Pulau Nangka and Pulau Undan were also taken into consideration during the discussion on Impacts and Mitigating Measures.

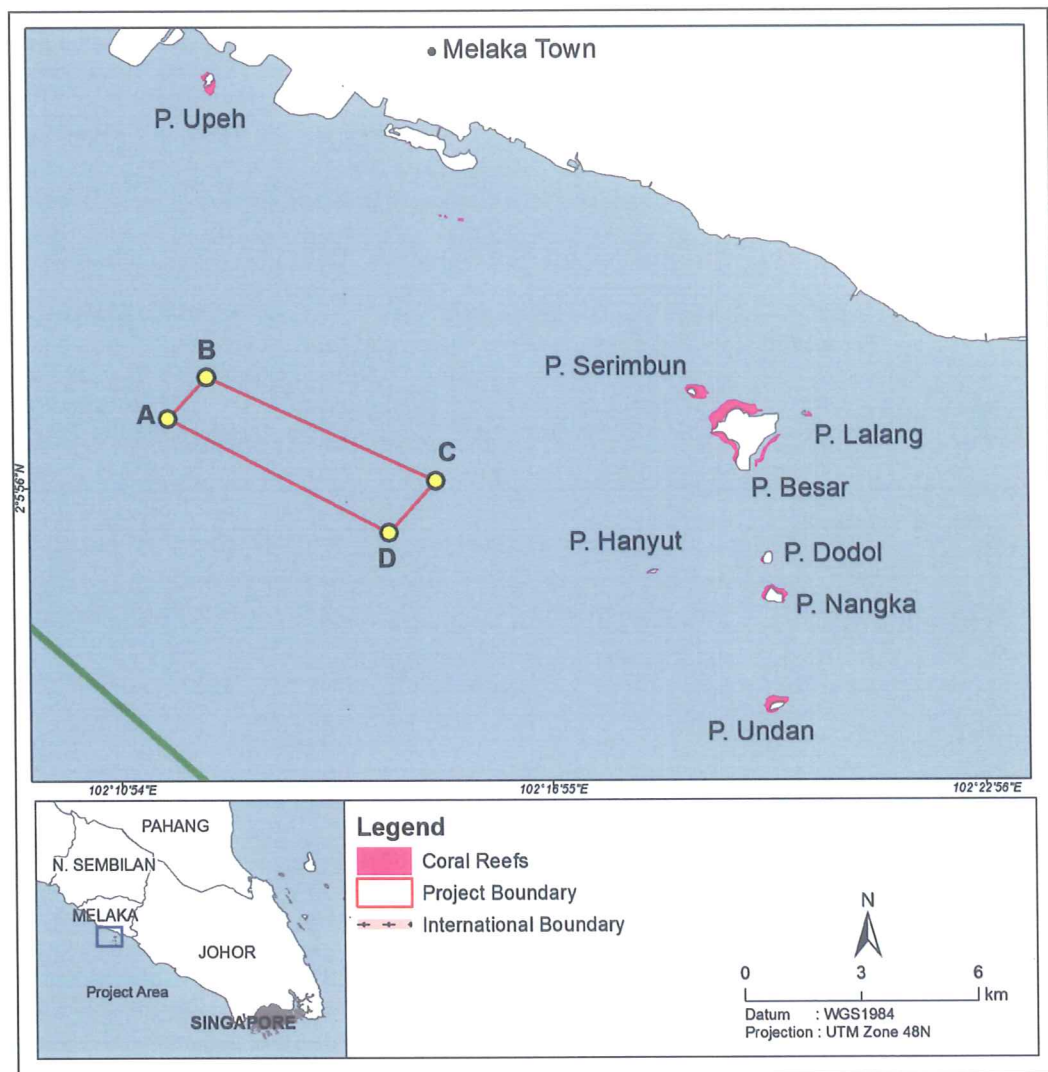


Figure ES1: Location of proposed sand concession site

Table ES1: Coordinates of sand concession site

Point	WGS 84	
	Longitude	Latitude
A	102°12'06.9"	2°07'28.3"
B	102°15'18.7"	2°06'02.0"
C	102°14'39.1"	2°05'18.8"
D	102°11'34.4"	2°06'53.8"

The Proposed Project involves sand dredging in an area covering 10.09 km². The sand dredging activities are typical of any sand dredging project and will involve the following stages:-

- Pre-dredging Stage
- Dredging and Filling Stage
- Post Dredging Stage.

A summary of the stages and associated activities that will be involved in an offshore sand mining are given in **Table ES2**.

Table ES2: Summary of sand dredging activities

STAGE	ACTIVITIES	DESCRIPTION
Pre-dredging stage	<ul style="list-style-type: none"> • Site Investigations • Surveys • Dredging and transport logistics 	<ul style="list-style-type: none"> • Site survey including oceanographic survey and bathymetric mapping; • Hydraulic Study • EIA study; • Sand sampling and laboratory analysis; • Seabed investigations and others; • Determination of suitable dredger and barges • Determination of approved marine routing (from Jabatan Laut)
Dredging and Filling Stage	<ul style="list-style-type: none"> • Dredging Works • Filling Works 	<ul style="list-style-type: none"> • Mobilization of dredger to concession site; • Transporting and delivery of fill material from concession site to reclamation site.
Post Dredging Stage	<ul style="list-style-type: none"> • Demobilization 	<ul style="list-style-type: none"> • Demobilization of dredger from the site and site rehabilitation.

3.0 MAIN ISSUES ASSOCIATED WITH IMPLEMENTATION OF PROJECT

The EIA study identified six main issues of concern associated with the implementation of the sand mining operation. These are:-

3.1 Generation and Dispersion of Sediment Plume

During the sand dredging process (by a trailer suction hopper dredger) it is inevitable that sediment plume will be created. A hydraulic modeling was conducted to assess the amount of total suspended solids (TSS) that will be generated and how far the plume will be dispersed. **Figure ES2** summarizes the results of this assessment.

The figure shows that during all three monsoon periods a TSS concentration of up to 60 mg/L may be generated but it will stay within or very close to the concession site. The hydraulic study found that the plume may disperse up to 35 km from the dredging point in the NW-SE direction. However, the increase in TSS concentration at that point will only be around 5 mg/L. The hydraulic study also shows that the 5 mg/L concentration will be maintained around 10% of the time only.

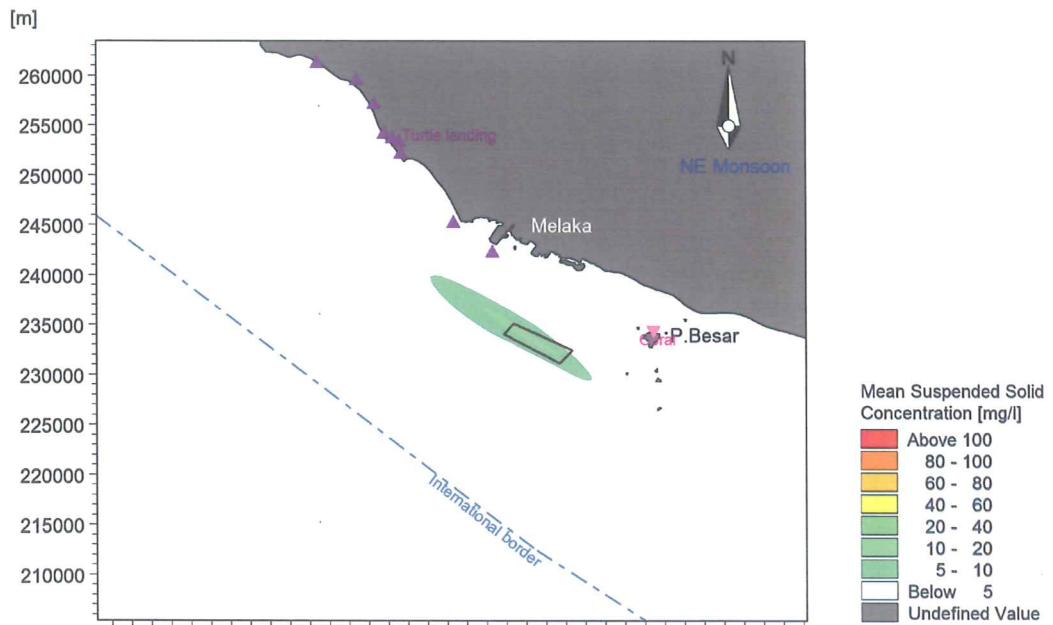


Figure ES2: Mean suspended solid concentration for NE monsoon.

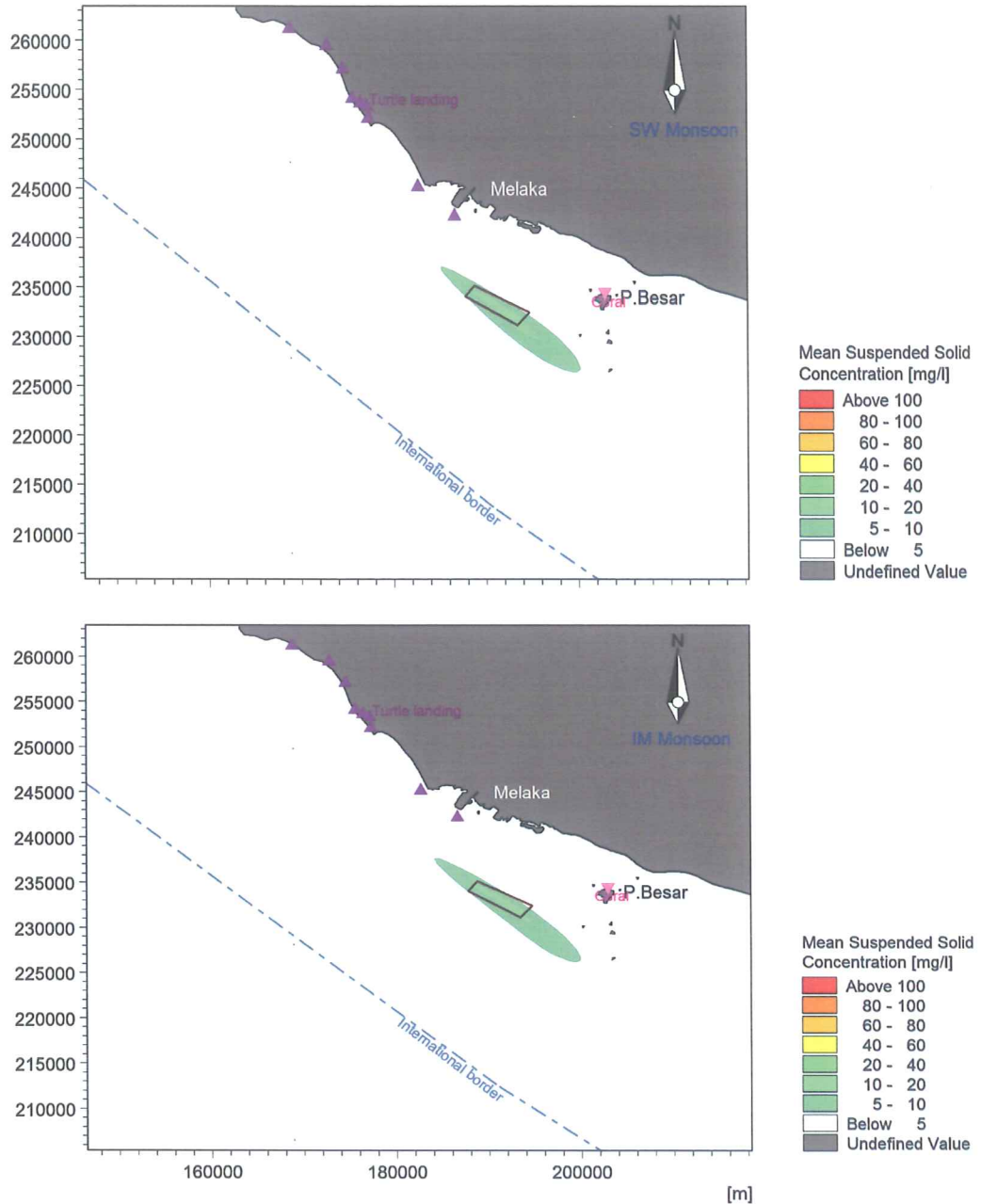


Figure ES2: (cont) for SW Monsoon and inter monsoon period.

3.2 Impact on General Water Quality

The main water quality parameter of concern is TSS and to a lesser extent oil & grease. The issue on TSS has already been discussed under 3.1 and the issue on O&G is not considered significant, provided proper mitigating measures are implemented, particularly in terms of good housekeeping on the part of the dredging contractor.

3.3 Impacts on Marine Biology

The main issue would be the removal of macroinfauna from the concession site to the reclamation area. This impact is not considered significant for two reasons. Firstly, no endemic species were identified during the study which would require special conservation strategy to prevent total removal of that species. Secondly, earlier studies have shown that with time benthic communities will rehabilitate.

3.4 Impacts on Ecological Sensitive Habitats

Two ecological sensitive receptors were considered during the study, namely the coral habitats on Pulau Besar, Pulau Nangka and Pulau Undan and the turtle nesting sites on Pulau Upeh. The main concern is the increase in TSS concentration that may damage the coral reefs and the impacts of glaring light and noise on turtle landings on Pulau Upeh.

3.5 Impacts on Socio-Economy and Fisheries

As most of the fishermen in Melaka are coastal fisherman, the sand mining activities located nine kilometres offshore is not expected to be significant. However, the concern would be during the transport of the sand to the reclamation area/s. This activity may have negative impacts on the fishing communities and as such proper mitigating measures must be in place. Regular discussion with the local fishing communities is essential.

3.6 Impacts on Marine Traffic and Navigation

With proper mitigating measures, the proposed sand mining activities is not expected to have significant negative impacts on marine traffic and navigation.

4.0 MAIN POLLUTION PREVENTION AND MITIGATION MEASURES

4.1 Impacts in Marine Water Quality

The most important impact of the proposed sand mining project is the creation of sediment plume, the extent of its dispersion and if it will cause any damage to the coral habitats on three nearby islands of P. Besar, P. Nangka and P. Undan. Although the hydraulic study concluded that the plume will not reach these islands, a proactive measure must be in place to prevent significant increase in TSS around the coral reefs which may cause mortality to the living corals. It is proposed that only one dredger be used at the initial stage and only two loadings in a day. During the first month of operation a weekly monitoring of TSS around the islands must be carried out. Since these stations were not included in the EIA study, a pre-project assessment of the TSS level must be conducted to be used as reference. If the TSS levels were found to increase significantly, a discussion with the dredging contractor shall be held to strategize a way to mitigate the problem. However, if no significant increase in TSS concentration is observed,

the weekly monitoring can be terminated but a monthly monitoring of the water quality, involving other parameters, shall proceed.

If the dredging activities were to be increased, eg three loads a day or increase in number of dredgers, the Melaka DOE must be consulted. If the proposal is approved by the DOE, the weekly monitoring as described earlier for the island stations shall be repeated for a period of a month.

Increase in TSS concentration may also be the result of overflow from the trailer hopper. As a mitigating measure, this overflow shall be directed to the seabed to avoid surface sediment plume.

Good housekeeping on board the dredger must be maintained at all times to prevent oily materials from being washed off deck into the surrounding water. There shall be no disposal of oily wastes at sea; these must be collected accordingly and disposed of on land.

4.2 Impacts on Turtle Nesting Activities

The activities of the sand dredging are expected to continue at night. As such there may be an increase in amount of light and noise level around the site. Although the concession site is almost 8 km from the nearest turtle nesting sites on P. Upeh, the dredger may move closer to the island during transportation. As glaring light and noise may scare the nesting turtles, proper mitigating measure must be carried out particularly when passing close to the island at night during the turtle nesting season. A collaborative effort with the Fisheries Department is essential.

4.3 Summary of Potential Impacts and Mitigating Measures

The summary of potential impacts and mitigating measures are as listed in **Table ES3**.

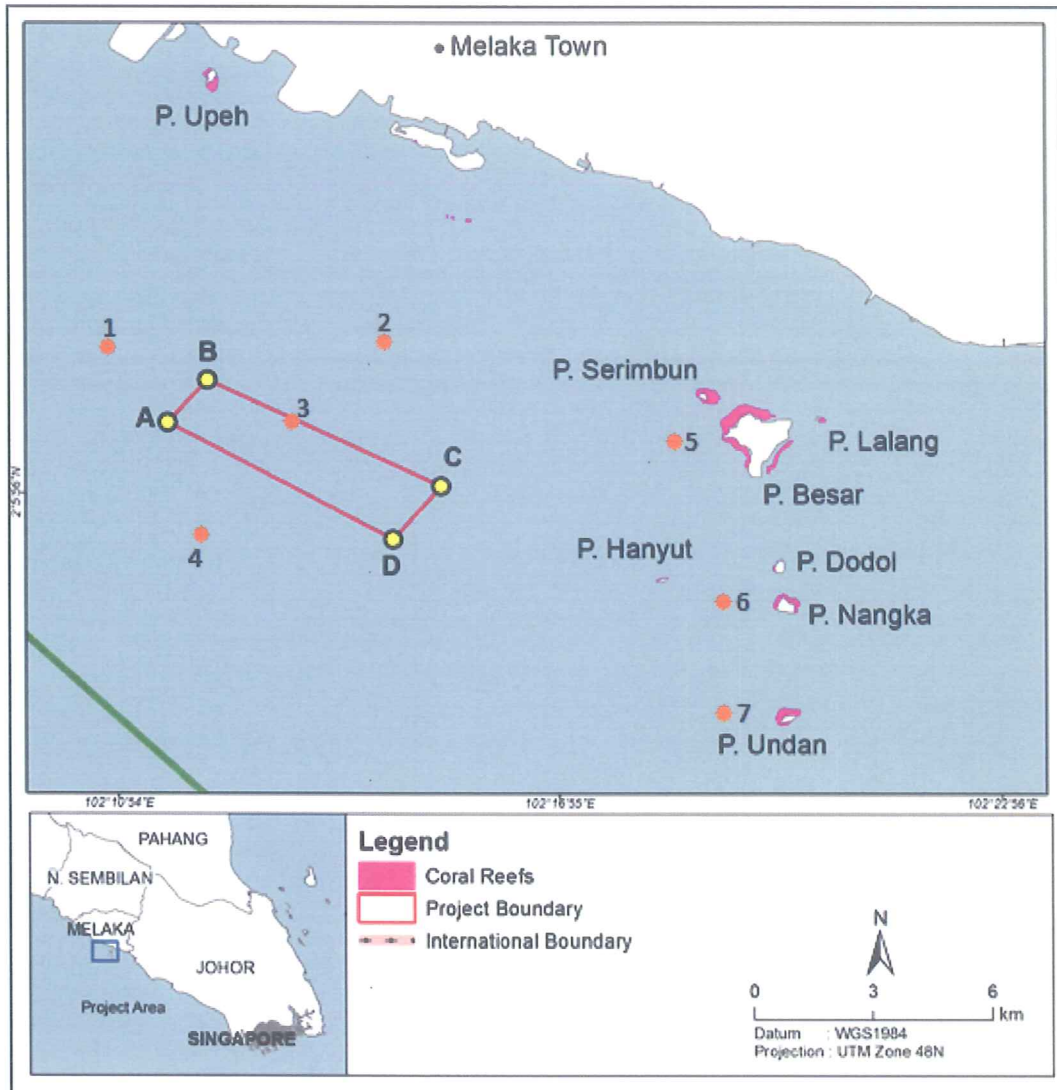
Table ES3: Summary of Impacts and Mitigating Measures

SIGNIFICANT POTENTIAL IMPACTS	MAGNITUDE OF IMPACTS	P2M2	REFERENCE PAGE
Decline in marine water quality; mainly increase in TSS and to a lesser extent oil and grease	Increase in TSS may be significant but limited within the site.	<ul style="list-style-type: none"> Use of suction dredger recommended to reduce disturbance to bottom materials; At initial stage of operation limit to only 1 dredger and 2 loads a day; Weekly monitoring for a month at 3 stations around P. Besar, P. Nangka and P. Undan; and Overflow from the dredger shall be directed below the water surface, preferably at depth that do not allow the upwelling of sediment resulting from the wake created by the dredger 	7-24 to 7-34
	Increase in level of O&G is not expected to be significant provided good housekeeping is maintained	<ul style="list-style-type: none"> Good housekeeping maintained on dredger at all times; No disposal of oily materials at sea; Oily waste collected accordingly and dispose of on land 	7-34
Removal of macroinfauna	Not expected to be significant because: (i) No endemic species identified; and (ii) Benthic communities expected to recover with time	To reduce the impacts on the benthic population, the mining area should be made as small as possible.	7-35
Increase in marine traffic	Not expected to be significant	None	7-38 to 7-39
Decline in fisheries activities	Not significant with proper mitigating measures	None	7-36 to 7-37
Increase in domestic wastes	Not significant with proper mitigating measures	<ul style="list-style-type: none"> All domestic wastes must be collected accordingly and dispose of on land; and No disposal of solid wastes at sea; 	7-40

5.0 MONITORING PROGRAMME

Summary of the monitoring programme is as follows:-

Issues	Monitoring Target	Parameters	Compliance	Frequency
Water Quality	Discharges from sand dredging activity at 7 stations including four used during EIA study with additional 3 stations at P. Besar, P. Nangka and P. Undan	TSS, O&G, Lead, Copper, Nickel, Mercury, Cadmium, Chromium	Class II Malaysian Marine Water Quality Standard	Monthly basis
Water Quality	3 station at P. Besar, P. Nangka and P. Undan to ensure no significant impact on coral communities.	TSS and O&G	Class I Malaysian Marine Water Quality Standard	Weekly for first month of operation. Discontinue if no significant increase.
Fishery Resources	Fish catches at nearby fish landing jetties	Fish catch/landings quantity and variety	-	As need for information
Turtle Population	Turtle landings on Pulau Upeh	Number of landings and eggs recorded for P. Upeh	-	As need for information
Marine Traffic	Safety	Number of accidents/location at sea	-	As need for information



Station	Coordinate	
	Longitude	Latitude
1	102° 10' 49.16" E	2° 7' 50.12" N
2	102° 14' 6.77" E	2° 8' 6.41" N
3	102° 12' 55.48" E	2° 7' 6.98" N
4	102° 12' 6.95" E	2° 5' 20.37" N
5	102° 18' 27.12" E	2° 6' 26.37" N
6	102° 19' 10.00" E	2° 4' 29.30" N
7	102° 19' 13.86" E	2° 2' 45.98" N

Figure ES3: Water quality monitoring stations

RINGKASAN EKSEKUTIF

RINGKASAN EKSEKUTIF

1.0 PENGENALAN

1.1 Tajuk Projek

Laporan EIA ini telah disediakan bagi cadangan projek bertajuk "PERMOHONAN MELOMBONG PASIR DI BAWAH SEKSYEN 4, AKTA PELANTAR BENUA 1966, P.U 2006 DI KAWASAN LUAR PERAIRAN NEGERI MELAKA" oleh syarikat KAJ Development Sdn Bhd.

1.2 Pemaju Projek

Pemaju projek ini ialah **KAJ Development Sdn Bhd** (Co. No. 758258). Pemaju boleh dihubungi melalui alamat berikut:-

KAJ Development Sdn. Bhd.
No 1, Jalan Baiduri 2,
Taman Pulau Melaka,
75000 Melaka.

Pegawai berkenaan : **En. Hasbullah Zakaria**
(Pengurus Besar)
Tel. : 06 232 1226
Fax : 06 233 2923

1.3 Perunding EIA

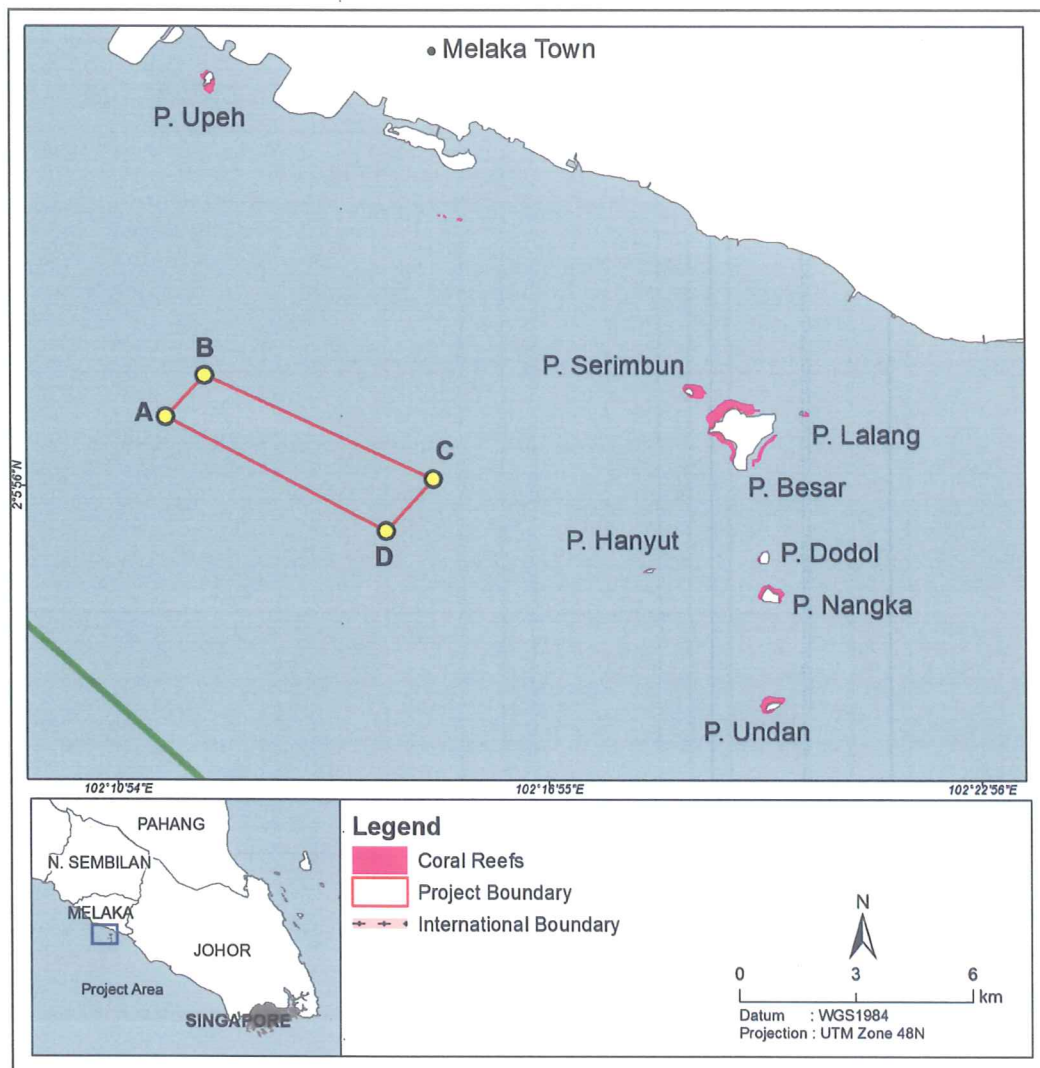
L I Environmental Consultants Sdn Bhd (Co. No. 656407-P), telah dilantik oleh pemaju projek untuk menjalankan kajian EIA dan menyediakan laporan EIA untuk dihantar kepada Jabatan Alam Sekitar Negeri Melaka. Perunding EIA boleh dihubungi melalui alamat berikut:-

L I Environmental Consultants Sdn Bhd
723 V2, Vanda Business Park
Jalan Sungai Dua
11700 Pulau Pinang.

Pegawai Berkenaan : **Prof (R) Dato' Dr. Zubir bin Din**
(Pengarah Urusan, Pendaftaran JAS C0011)
Tel. : 04 660 5404
HP : 012 4040 353
Fax. : 04 660 5401

2.0 PENGHURAIAN PROJEK

Rajah RE1 menunjukkan lokasi cadangan konsesi pasir berkenaan dan koordinat lokasi diberi di dalam Jadual RE1. Tapak ini terletak lebih kurang 9 km dari pantai Melaka. Terdapat dua reseptor sensitif dalam lingkungan 10 km jejari dari tapak projek, iaitu habitat terumbu karang pada P. Besar dan tapak pendaratan penyu pada P. Upeh. Selain itu, impak terhadap terumbu karang pada Pulau Nangka dan P. Undan juga diambil kira oleh kerana kepentingan habitat ini dari segi ekologi.



Rajah RE1: Kedudukan tapak cadangan konsesi pasir.

Jadual RE1: Koordinat tapak konsesi pasir.

Titik	Koordinat	
	Longitud	Latitud
A	102°12'06.9"	2°07'28.3"
B	102°15'18.7"	2°06'02.0"
C	102°14'39.1"	2°05'18.8"
D	102°11'34.4"	2°06'53.8"

Projek yang dicadangkan melibatkan pengorekan pasir di dalam kawasan tapak seluas 10.09 km². Aktiviti pengorekan pasir sama seperti aktiviti pengorekan pasir yang lain, iaitu melibatkan peringkat-peringkat berikut:-

- Peringkat pra-pengorekan
- Peringkat pengorekan dan penambakan
- Peringkat pasca pengorekan.

Ringkasan peringkat-peringkat dan aktiviti berkaitan bagi pengorekan lepas pantai adalah seperti di dalam **Jadual RE2**.

Jadual RE2: Ringkasan aktiviti pengorekan pasir

PERINGKAT	AKTIVITI	PENGHURAIAN
Peringkat pro-pengorekan	<ul style="list-style-type: none"> • Siasatan tapak • Perangkaan • Logistik pengorekan dan pengangkutan 	<ul style="list-style-type: none"> • Kaji selidik (survey) tapak termasuk kaji selidik batimetri; • Kajian hidraulik • Kajian EIA; • Persampelan pasir dan analisis makmal; • Siasatan tapak dan lain; • Pemilihan kapal pengorek dan baj; dan • Penentuan laluan yang diluluskan (oleh Jabatan Laut)
Peringkat pengorekan dan penambakan	<ul style="list-style-type: none"> • Pengorekan pasir • Penambakan di kawasan berkenaan 	<ul style="list-style-type: none"> • Pergerakan kapal pengorek ke tapak konsesi; • Pengangkutan pasir dari tapak konsesi ke tapak tebusguna dan balik.
Peringkat pasca-pengorekan	<ul style="list-style-type: none"> • Demobilisasi 	<ul style="list-style-type: none"> • Pergerakan kapal pengorek meninggalkan tapak konsesi dan pemulihan tapak

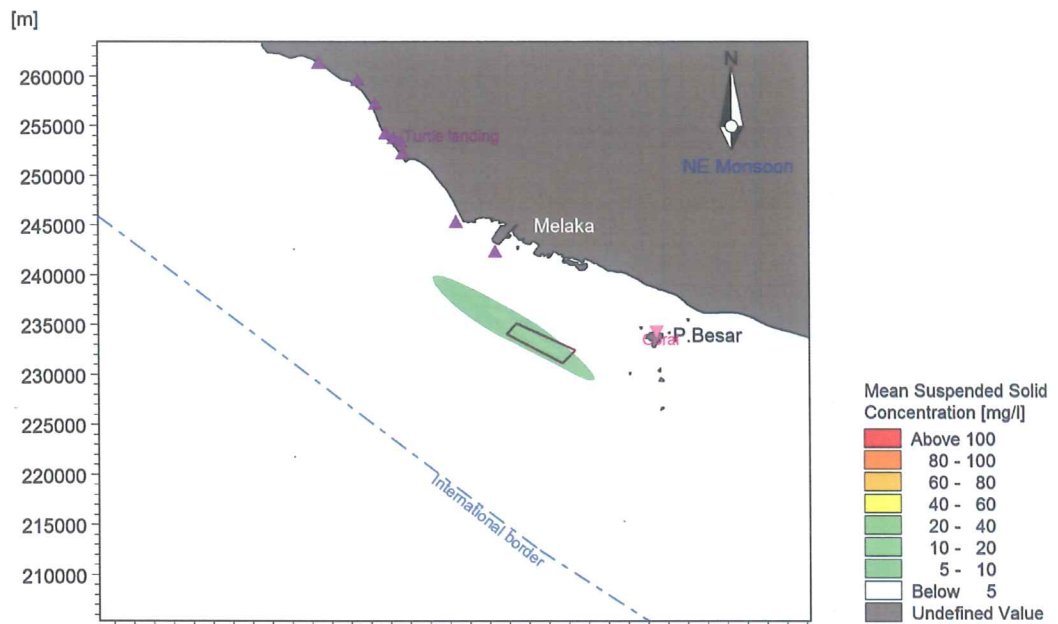
3.0 ISU UTAMA BERKAITAN PERLAKSANAAN PROJEK

Kajian EIA mengenalpasti enam isu utama berkaitan dengan pelaksanaan projek pengorekan pasir ini, iaitu:-

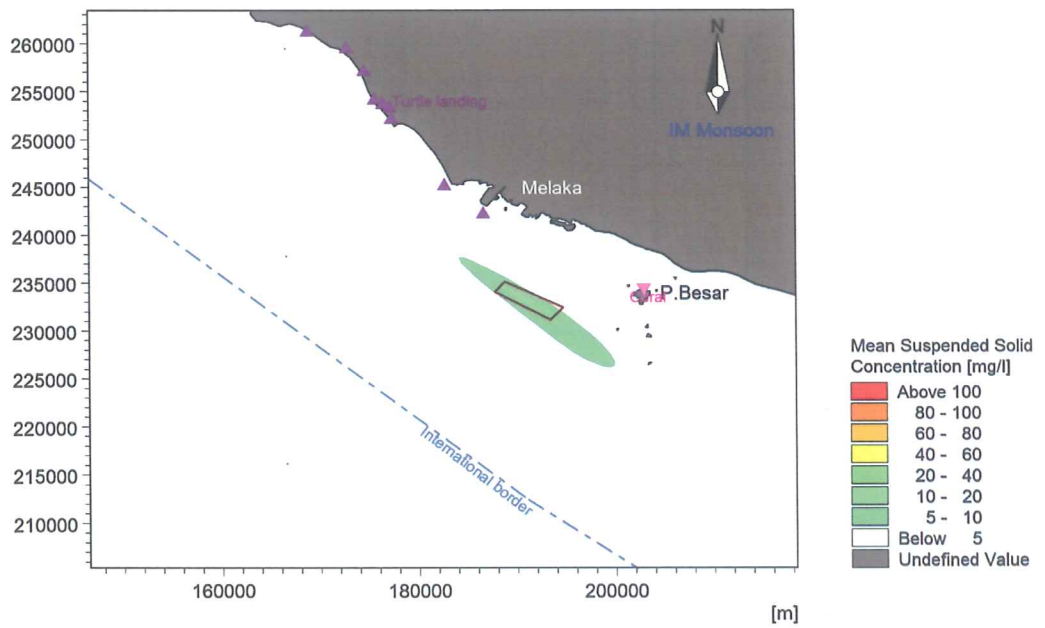
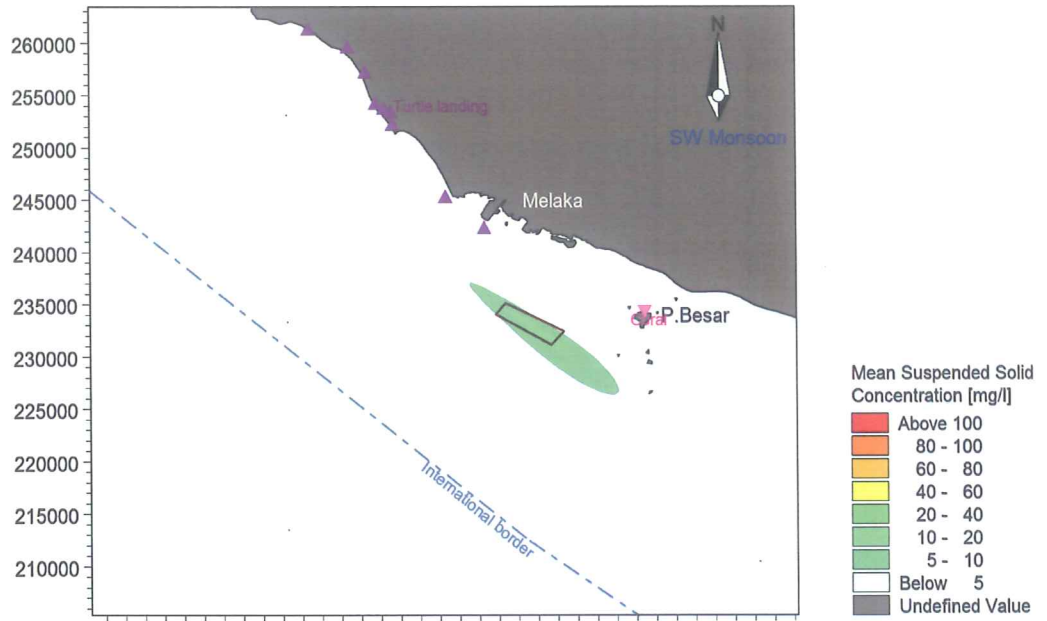
3.1 Penghasilan dan Penyerakan Plum Sedimen

Semasa proses pengorekan pasir (menggunakan TSHD), plum sedimen akan terhasil. Pemodelan hidraulik telah dijalankan untuk menilai jumlah pejal terampai (TSS) yang akan dihasilkan dan sejauh mana plum ini akan disebar. **Rajah RE2** memberi ringkasan hasil penilaian ini.

Rajah ini menunjukkan semasa ke tiga-tiga musim monsun, kandungan TSS boleh meningkat sehingga 60 mg/L tetapi plum ini akan kekal di dalam tapak konsesi atau berhampiran dengannya. Kajian hidraulik mendapati plum boleh tersebar sehingga 35 km dari kawasan tapak mengikut arah barat laut-tenggara (NW-SE). Walau bagaimanapun pada titik ini, peningkatan kandungan TSS hanyalah sekadar 5 mg/L. Kajian juga menyimpulkan kandungan ini akan hanya kekal selama 10% masa sahaja.



Rajah ES2: Min kandungan pejal terampai semasa monsun Timur Laut.



Rajah RE2: (samb) untuk monsun Barat Daya dan tempoh antara monsun.

3.2 Impak terhadap Kualiti Air Secara Am

Parameter kualiti air paling diutamakan ialah TSS dan juga minyak dan gris, walaupun parameter ini kurang membimbangkan. Isu TSS telahpun dihuraikan di dalam bahagian 3.1 dan isu minyak dan gris dianggap tidak bererti, dengan syarat langkah tebatan dilaksanakan sepenuhnya, terutamanya dari segi 'good housekeeping' oleh kontraktor pengorekan.

3.3 Impak terhadap Biologi Marin

Isu utama ialah pemindahan makroinfauna dari tapak konsesi ke tapak tebusguna tanah. Impak ini tidak dianggap bererti berasaskan dua sebab. Pertama sekali tiada spesies endemik dikenalpasti semasa kajian EIA dijalankan, yang memerlukan strategi pemuliharaan khusus untuk mengelakkan pemupusan spesies berkenaan. Kedua, kajian terdahulu telah menunjukkan melalui masa, komuniti bentos akan membaikpulih dengan sendirinya.

3.4 Impak Terhadap Habitat Sensitif Ekologi

Dua reseptor sensitif ekologi dipertimbangkan semasa kajian ini, iaitu habitat terumbu karang di P. Besar, P. Nangka dan P. Undan serta tapak pengeraman penyu di P. Upeh. Kebimbangan utama ialah peningkatan TSS yang boleh merosakkan habitat terumbu karang dan kesan cahaya terang dan hingar terhadap pendaran penyu di P. Upeh.

3.5 Impak Sosio-ekonomi dan Perikanan

Oleh kerana hampir kesemua nelayan di Melaka adalah nelayan pesisir, aktiviti pengorekan pasir di kawasan yang terletak lebih kurang 9 km dari pantai itu dirasakan tidak akan memberi impak negatif yang bererti. Walau bagaimanapun kebimbangan adalah semasa pengangkutan pasir ke kawasan tebusguna tanah. Aktiviti ini mungkin akan memberi kesan negatif terhadap komuniti nelayan dan dengan demikian langkah-langkah tebatan yang sesuai perlu dilaksanakan. Perbincangan berterusan bersama komuniti nelayan tempatan amatlah penting.

3.6 Impak Terhadap Trafik Marin dan Navigasi

Dengan langkah tebatan yang sesuai, aktiviti pengorekan pasir ini dijangka tidak akan memberi impak negative yang bererti terhadap trafik marin dan navigasi.

4.0 PENCEGAHAN PENCEMARAN DAN LANGKAH TEBATAN UTAMA

4.1 Impak Terhadap Kualiti Air Laut

Impak paling utama berkaitan pelombongan pasir yang dicadangkan ialah pembentukan plum sedimen, sejauh mana ia akan tersebar dan kesannya terhadap habitat terumbu karang yang terdapat di pulau berhampiran, iaitu P. Besar, P. Nangka and P. Undan. Walaupun kajian hidraulik membuat kesimpulan plum ini tidak akan sampai kepada kawasan-kawasan terumbu karang berkenaan, suatu langkah proaktif perlu dilaksanakan untuk mengelakkan peningkatan TSS yang bererti di persekitaran terumbu karang yang akan memudaratkan karang-karang yang hidup. Adalah dicadangkan pada peringkat awal hanya satu kapal pengorek digunakan dan maksimum dua pengangkutan pasir dijalankan sehari. Semasa bulan pertama operasi, pemantauan TSS perlu dijalankan setiap minggu di tiga stesen berhampiran pulau-pulau berkenaan. Oleh kerana stesen-stesen ini tidak digunakan semasa kajian EIA, penilaian kandungan TSS pra-projek perlu dijalankan dan nilai ini digunakan sebagai rujukan. Jika kandungan TSS didapati meningkat secara bererti, perbincangan dengan kontraktor pengorekan perlu diadakan untuk mencari jalan penyelesaian bagi masalah ini. Sekiranya kandungan TSS tidak meningkat secara bererti, pemantauan ini boleh dihentikan, tetapi pemantauan bulanan melibatkan parameter kualiti air yang lain perlu dijalankan.

Sekiranya aktiviti pengorekan perlu ditingkatkan, misalnya tiga pengangkutan sehari atau penambahan bilangan kapal pengorek, kelulusan pihak JAS harus diperolehi. Jika diluluskan, pemantauan TSS setiap minggu seperti yang telah diuraikan perlu dijalankan selama sebulan.

Peningkatan kandungan TSS boleh juga terhasil daripada limpahan daripada kapal pengorek. Sebagai langkah mitigasi, limpahan ini harus dihalakan ke dasar laut untuk mengelakkan pembentukan plum sedimen di permukaan.

Kebersihan di atas kapal pengorek harus dikekalkan melalui '*good housekeeping*' untuk mengelakkan bahan berminyak terlimpah dari dek kapal ke dalam laut. Pembuangan sisa berminyak ke laut tidak dibenarkan sama sekali. Sisa-sisa ini harus dikumpul dengan cara bersesuaian dan dibuang di darat mengikut kaedah yang diluluskan.

4.2 Impak Terhadap Aktiviti Pengeraman Penyu

Aktiviti pengorekan dan pengangkutan pasir dijangka akan juga dijalankan di waktu malam. Ini akan menyebabkan peningkatan cahaya dan hingar di kawasan pengorekan. Walaupun tapak konsesi hampir 8 km dari kawasan pendaratan penyu yang paling hampir (iaitu di P. Upeh), kapal pengorek mungkin menghampiri pulau ini semasa mengangkut pasir ke kawasan tebusguna. Oleh kerana cahaya terang dan hingar boleh menakutkan penyu yang ingin mendarat, langkah tebatan yang sesuai perlu dilaksanakan khususnya ketika menghampiri P. Upeh di waktu malam semasa musim penyu mendarat. Kerjasama di antara pihak pemaju dan Jabatan Perikanan amat perlu bagi menjayakan pelaksanaan langkah mitigasi ini.

4.3 Ringkasan Impak Dijangkakan dan Langkah Tebatan

Ringkasan impak yang dijangkakan dan langkah tebatan disenaraikan di dalam **Jadual RE3**.

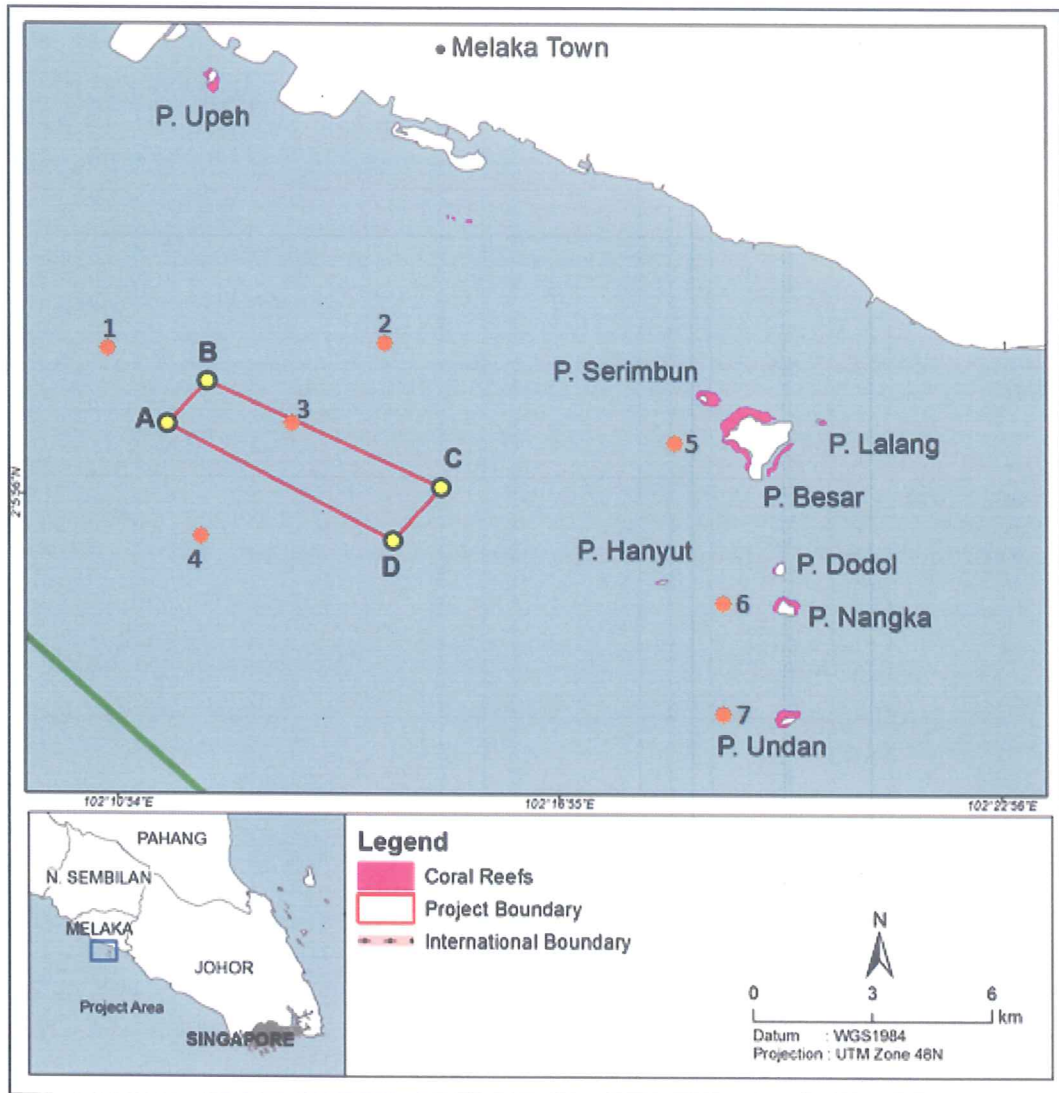
5.0 PROGRAM PEMANTAUAN

Ringkasan program pemantauan adalah seperti berikut:-

Isu	Sasaran Pemantauan	Parameter	Pematuhan	Kekerapan
Kualiti Air	Discas daripada aktiviti pengorekan pada 7 stesen, termasuk empat yang digunakan semasa kajian EIA dan tambahan 3 stesen berhampiran P. Besar, P. Nangka dan P. Undan	TSS, O&G, plumbum, kuprum, nickel, merkuri, kadmium, kromium	Kelas II Standard Kualiti Air Marin Malaysia	Setiap bulan
Kualiti Air	Tambahan 3 stesen di P. Besar, P. Nangka dan P. Undan untuk memastikan tiada impak bererti terhadap komuniti terumbu karang	TSS and O&G	Kelas I Standard Kualiti Air Marin Malaysia d	Setiap minggu bagi bulan pertama operasi. Dihentikan sekiranya tiada peningkatan bererti
Hasil Perikanan	Hasil perikanan bagi jeti pendaratan ikan berhampiran	Hasil tangkapan /kuantiti pendaratan ikan serta jenis ikan	-	Diperlukan sebagai maklumat
Populasi penyu	Pendaratan penyu di Pulau Upeh	Number of landings and eggs recorded for P. Upeh	-	Diperlukan sebagai maklumat
Trafik marin	Keselamatan	Bilangan kemalangan dan lokasi di laut	-	Diperlukan sebagai maklumat

Jadual RE3: Ringkasan Impak dan Langkah Tebatan

IMPAK BERERTI DIJANGKAKAN	MAGNITUD IMPAK	P2M2	MS RUJUKAN
<p>Penurunan kualiti air laut; khususnya peningkatan kandungan TSS dan sedikit minyak dan gris</p>	<p>Peningkatan TSS mungkin bererti tetapi terhad di dalam kawasan tapak konsesi</p>	<ul style="list-style-type: none"> • Penggunaan kapal TSHD dicadangkan untuk mengurangkan gangguan bahan dasar laut • Pada peringkat awal operasi, 1 kapal dan 2 pengangkutan sehari dicadangkan; • Pemantauan TSS setiap minggu pada 3 stesen berhampiran Besar, P. Nangka and P. Undan; • Limpahan dari kapal ditujukan ke dasar laut, sebaiknya pada kedalaman yang tidak membenarkan pembuangan sedimen ke permukaan 	<p>7-34 hingga 7-34</p>
<p>Penyingkiran makroinfauna dari tapak pengorekan</p>	<p>Peningkatan minyak dan gris dijangka tidak bererti dengan syarat 'good housekeeping' dikekalkan</p>	<ul style="list-style-type: none"> • 'Good housekeeping' dikekalkan di atas kapal sepanjang masa; • Bahan berminyak tidak boleh dilupuskan di laut; • Sisa berminyak harus dikumpulkan dengan cara yang betul dan dilupuskan di darat 	<p>7-34</p>
<p>Peningkatan trafik marin</p>	<p>Dijangka tidak bererti kerana: (i) Tiada terdapt spesies endemik; dan (ii) Komuni bentos akan pulih melalui masa</p>	<p>Untuk mengurangkan impak terhadap bentos, luas kawasan pengorakan harus seberapa kecil yang boleh</p>	<p>7-35</p>
<p>Pengurangan aktiviti perikanan</p>	<p>Dijangka tidak bererti dengan langkah tebatan yang sesuai</p>	<p>Tiada</p>	<p>7-38 hingga 7-39</p>
<p>Peningkatan sisa domestik</p>	<p>Dijangka tidak bererti dengan langkah tebatan yang sesuai</p>	<p>Tiada</p> <p>Semua sisa domestic harus dikumpulkan dengan kaedah yang betul dan dilupus di darat; dan Pelupusan sisa pejal di laut tidak dibenarkan sama sekali</p>	<p>7-36 hingga 7-37</p> <p>7-40</p>



Stesen	Koordinat	
	Longitud	Latitud
1	2° 7'50.12"N	102°10'49.16"E
2	2° 8'6.41"N	102°14'6.77"E
3	2° 7'6.98"N	102°12'55.48"E
4	2° 5'20.37"N	102°12'6.95"E
5	2° 6'26.37"N	102°18'27.12"E
6	2° 4'29.30"N	102°19'10.00"E
7	2° 2'45.98"N	102°19'13.86"E

Rajah RE3: Stesen pemantauan kualiti air.