Section 9
Environmental Management Framework

SECTION 9 : ENVIRONMENTAL MANAGEMENT FRAMEWORK

9.1 INTRODUCTION

In view of the potential impacts to the affected communities due to the construction works that will take place, proper environmental management framework must be in place at an early stage to ensure that relevant mitigating measures will be implemented and monitored during construction stage by all the parties.

A Master EMP will be prepared for the Project, which is a requirement by the DOE. This EMP will be submitted to the DOE for approval prior to commencement of construction works.

This section outlines the proposed environmental management framework during construction stage, which will be further elaborated in the EMP. The framework addresses the following key components:

- Organisation set-up – which will form the back-bone of the environmental management structure in identifying roles and responsibilities of each parties involved in the Project.

- Environmental communication line – which will indicate the different levels of communication required during different stages, particularly where it involves the public and other stakeholders.

- Environmental reporting – which will state the types of reporting required, either in terms of reports to be prepared and submitted as well as meetings to discuss environmental performance.

- Environmental monitoring and auditing – which will stipulate the monitoring and auditing requirements in terms of environmental quality (water quality, noise level, vibration level and air quality) as well as implementation of the mitigating measures proposed in the DEIA and EMP.

- Emergency response plan – which will identify the various responses to emergencies that could potentially occur at the Project site.

SECTION 9 : ENVIRONMENTAL MANAGEMENT FRAMEWORK

9.2 ENVIRONMENTAL MANAGEMENT OBJECTIVES

The post-EIA environmental management objectives for the Project shall be :

- Comply with all environmental requirements imposed by the DOE, including requirements by other agencies such as the DID, DOSH, Mineral and Geoscience Department and relevant local authorities.

- Implement the EMP and monitor its implementation to ensure that potential significant impacts (such as traffic congestion, noise, vibration and dust and construction risks) are minimised to acceptable level.

- Conduct audit to assess level of environmental performance both in terms of compliance to legal environmental requirements as well as complaints from the public or community.

- Communicate Project's environmental performance to the public and relevant stakeholders.

9.3 ORGANISATION STRUCTURE

9.3.1 Roles and Responsibility

An effective environmental management requires a clear identification of the roles and responsibilities of each party involved in the Project. Another important aspect is clear definition of lines of communication and reporting in ensuring that proper actions can be carried out and implemented towards effective environmental management at the site. This is particularly so in view of the size and magnitude of the Project will involve numerous contractors, sub-contractors and consultants.

The key parties for the Project are:-

- Project Proponent – **Prasarana Malaysia Berhad**

- Supervising Authority – **Suruhanjaya Pengangkutan Awam Darat**

- Project Delivery Partner (PDP) – to be appointed at a later date

SECTION 9 : ENVIRONMENTAL MANAGEMENT FRAMEWORK

Besides the key parties identified, all the contractors, sub-contractors and various consultants need to be informed of their specific environmental roles and responsibilities (**Table 9-1**).

Table 9-1 Proposed Environmental Roles and Responsibility

Roles	Responsibility
Supervising Agency	• To monitor environmental compliance by Project Proponent and PDP as per contractual requirements.
Project Proponent	• To comply with the EIA approval conditions and other relevant environmental requirements. • To ensure environmental protection works to mitigate environmental impacts are incorporated in the tender document. • To implement mitigating measures specified in the EIA, EMP and ESCP. • To monitor environmental compliance by PDP as per contractual environmental requirements.
Project Delivery Partner	• To ensure that all the items listed above are complied with and implemented during construction stage. • To brief all contractors, sub-contractors and consultants about environmental requirements. • To monitor environmental compliance by all contractors, sub-contractors and consultants. • To communicate with the affected parties at site level to minimise impacts to the affected communities. • To submit relevant environmental reports to DOE. • To report environmental compliance to the DOE.
Contractor	• To ensure that environmental protection works are included in the tender document. • To construct or implement the environmental protection works for the work package. • To ensure compliance to environmental requirements at all time. • To submit relevant environmental reports to PDP for submission to DOE.

The roles and responsibility for each party will be further elaborated in the EMP to ensure smoother and effective implementation by all the relevant parties. The proposed organisation structure for environmental management is shown in **Chart 9-1**.

Environmental Management (EM) Unit will be established by the PDP to ensure all environmental requirements and mitigating measures are complied with and properly implemented during construction. The EM Unit will be headed by Head of Safety, Health and Environment, supported by Safety and Health Manager and Environmental Manager.

Each contractor for the various construction packages shall be required to establish their Environmental Team (ET) to ensure compliance to all environmental requirements. The ET should comprise of at least one Environmental Manager and one Environmental Engineer.

9.3.2 Line of Communication

A clear line of communication is crucial to avoid any misunderstanding and ensure smooth implementation of all relevant environmental protection works, including environmental monitoring and reporting. Each contractor for various work packages shall identify the personnel responsible for environmental management. At PDP level, the Head of Safety, Health and Environment will be the person in-charge of all matters pertaining to environmental related matters while at package or contractor level, the Environmental Manager will be the responsible person.

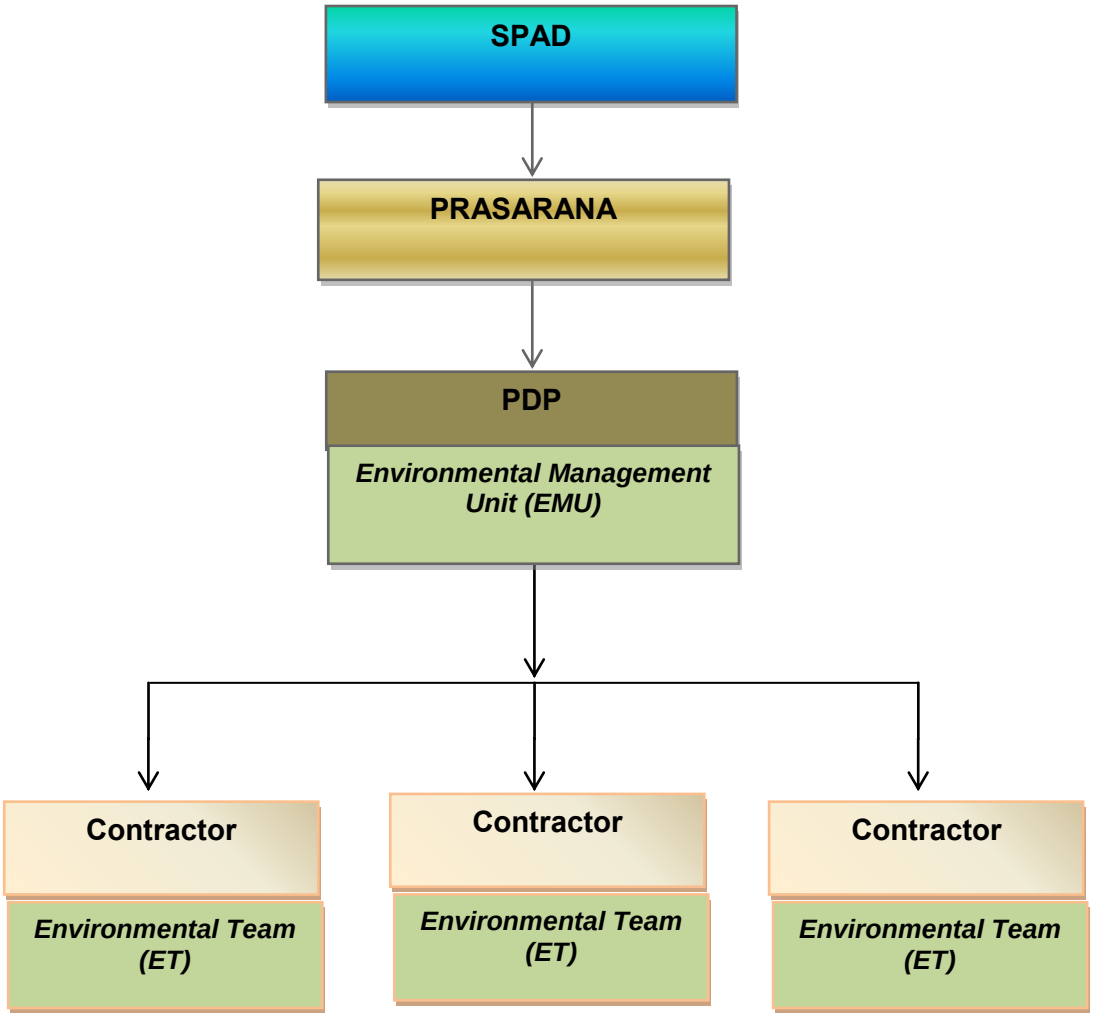
The EM Unit at PDP level will be responsible to ensure :

- Effective and efficient environmental management of the Project
- Proper reporting to PRASARANA and SPAD on all environmental related matters
- Close liaison with various contractors and consultants pertaining to environmental related matters at site level

Both the EM Unit and ET play important roles in ensuring that the contractors are fully committed in implementing all mitigating measures, conducting environmental monitoring and preparing environmental reports. They are also responsible in taking the necessary action during site visits by the DOE or other agencies.

SECTION 9 : ENVIRONMENTAL MANAGEMENT FRAMEWORK

Chart 9-1 Proposed Organisation Structure for Environmental Management



Note:

a) The proposed organisation structure is subject to change and depends on the overall Project Organisation Structure for its implementation.

b) The number of contractors shown is for illustrative purposes. The actual number of contractors for the Project will depend on the implementation strategy of the Project which will be determined at a later stage.

9.4 ENVIRONMENTAL COMMUNICATION

As part of the environmental management framework, it is important that regular communications with relevant stakeholders, affect communities and the general public be established and maintained to ensure a systematic, efficient and prompt response to any complaints and feedback. It is proposed that a comprehensive "Stakeholder Engagement Management Plan" be prepared to address and manage issues pertaining to the stakeholders, communities and the public.

9.4.1 Community Engagement

The engagement with local communities along the proposed alignment is vital both during the pre-construction and construction period. The engagement provides insights into the problems that may have arisen as a result of acquisition, relocation and construction works that will take place to enable the Project Proponent to quickly pinpoint the cause and remedy the situation.

Based on earlier engagements with the communities, it is evident that community engagement must be continuous as different issues arise at different stages. Most importantly, they want to be more involved in the formulation of the mitigating plans or measure to ensure that these measures are workable and effective. It is proposed that a specific communication plan with various platforms for communication should be utilised for engagement with the communities and these include discussions, meetings and SMS.

9.4.2 Response to Complaints

For a project of this magnitude, there is need for a proper system of handling complaints from the public and other stakeholders. A system whereby complaints are received, properly examined and attended to quickly is vital to minimise the level of nuisances to the affected parties. There will be a Customer Service Centre in place to handle these complaints.

When the complaint is received, the following actions shall be taken:

- The Customer Service Centre shall attend to the complaint within 24 hours. Depending on the nature of the problem, some complaints have to be attended to within a few hours or even immediately.

- The Customer Service Centre shall investigate the complaint and implement the necessary action within the timeframe. Action is to be taken until the complaint is finally resolved.

- The Customer Service Centre shall contact and inform the complainant of the action that has been taken.

- The Customer Service Centre shall create a Complaints Register to track the complaints received.

As part of the environmental management framework, the EM Unit of the PDP shall establish procedure to attend to the complaints received during construction stage.

It is important that a telephone hotline and an email address to forward complaints to are made known to the public. These numbers and email addresses shall also be clearly printed on hoardings and signages at all construction sites.

9.5 ENVIRONMENTAL REPORTING

Environmental reporting consists of two parts which are:

- Prepare relevant environmental reports for submission to DOE

- Report environmental status and issues (if any) arising from each work package during progress meetings or other relevant meetings to ensure specific actions can be carried out. This will be determined at a later stage during preparation of the EMP.

Types of environmental related reports and parties responsible for the report preparation during construction stage are as tabulated in **Table 9-2**.

Table 9-2 Types of Reporting Proposed for The Project

Report	Frequency	Responsibility
Master EMP for submission to DOE	One-off prior to construction	Environmental Management Unit (EMU) – PDP
Contract package specific EMP for submission to DOE	One-off prior to construction	Environmental Team (ET) – Package Contractor
Monthly Monitoring Report for submission to PDP	Once a month	Environmental Team (ET) – Package Contractor
Quarterly Compliance Report for submission to DOE	Once every three months or as required by DOE	Environmental Management Unit (EMU) – PDP

The monthly monitoring report shall be prepared by the ET of each contractor to monitor the status of the implementation of the Site Specific EMP. The objective of the monitoring report is to monitor the status of implementation of the Site Specific EMP and compliance to relevant environmental requirements so that relevant mitigating measures can be implemented.

The quarterly environmental compliance report shall be prepared by the EM Unit of the PDP. The objective of the compliance report is to monitor environmental compliance by the relevant contractors.

9.6 ENVIRONMENTAL MONITORING

There is a basic need in the environmental management of the Project to establish a suitable Environmental Monitoring Programme. The programme will require environmental sampling and monitoring to be carried out by competent personnel and accredited laboratory during construction and operational stage. The environmental monitoring will include the following components:

- Noise and Vibration Monitoring
- Water Quality Monitoring
- Silt Trap Discharge
- Air Quality Monitoring

Environmental monitoring shall be carried out at areas with active construction activities.

a) Noise and Vibration Monitoring

The provisional locations of the noise and vibration monitoring stations are tabulated in **Table 9-3** and **Figure 9-1a, 9-1b & 9-1c** which are the same as the baseline monitoring stations. The monitoring frequency will be monthly. Overall noise levels (L_{eq}), statistical percentile L_{10}, L_{90} and instantaneous maximum L_{max} levels for daytime and night time shall be reported.

Specific location for noise and vibration monitoring stations during construction stage cannot be determined at this stage as it will largely depends on types of construction activities and its locations. For example, vibration monitoring will be required for tunneling works that are located close to any buildings or structures. Similarly, noise monitoring will be required for piling works that are located close to residential premises. The exact location will be determined at a later stage during the preparation of the Master EMP and Site Specific EMP.

SECTION 9 : ENVIRONMENTAL MANAGEMENT FRAMEWORK

All noise and vibration instrumentation, procedures and data reporting to be in accordance to Annex B of DOE Planning Guidelines for Environmental Noise Control and Limits, Annex B of DOE Planning Guidelines for Vibration Control and Limits in the Environment, 2004, and vibration instrumentations requirements as per ISO 4866:1990/BS 7385-1: 1990, BS 7385-2:1993, BS 6472-1: 2008 and BS-2: 2008.

Vibration intensity (vibration velocities and/or accelerations) and frequency response of adjacent receivers from piling and underground works to be quantified and assessed against human response in buildings and potential structural damage (1 to 80 Hz) in accordance to ISO 4866:1990/BS 7385-1: 1990, BS 7385-2:1993, BS 6472-1: 2008 and BS-2: 2008.

Table 9-3 Provision Locations For Noise Level Monitoring

Station	Location	Description
N1	Jalan SS 21/42	Commercial
N2	Jalan SS 21/28	Commercial
N3	Jalan SS 21/13	Commercial
N4	Flat/Condominium Puncak Damansara	Residential
N5	Jalan Tropicana Selatan 1	Residential
N6	Persiaran Tropicana	Residential
N7	Jalan Lagenda Puteri 1	Residential
N8	Jalan PJU 1a/43	Residential
N9	D'Aman Crimson Apartments	Residential
N10	Suria Damansara Condominium	Residential
N11	Kelana D'Putera Condominium	Residential
N12	Persiaran Kerjaya 1	Residential
N13	Persiaran Kerjaya 2	Residential
N14	Jalan Kerjaya/Persiran Kerjaya	Residential
N15	Persiaran Kerjaya 3	Residential
N16	Politeknik Sultan Sallehuddin	Residential
N17	Building/Education Section 13	School
N18	Jalan Akuatik 13/77	Residential
N19	Jalan Bola Sepak Lima 13/11e	Residential
N20	Jalan Opu Daeng Chelak 9/2	Residential
N21	Persiaran Dato' Menteri 1	Residential
N22	Persiaran Dato' Menteri 2	Residential
N23	SIRIM	Office
N24	Persiaran Raja Muda	School
N25	Jalan Sarjana 1/2 -2	School

SECTION 9 : ENVIRONMENTAL MANAGEMENT FRAMEWORK

Table 9-3 Provision Locations For Noise Level Monitoring (Cont'd)

Station	Location	Description
N26	SJK (T)- I-City station	School
N27	Persiaran Permai	Residential
N28	Jalan Plumbum 7/97	Residential
N29	Jalan Plumbum 7/101	Residential
N30	Persiaran Permai/Bestari	Residential
N31	Bukit Raja Station	Commercial
N32	BBK Banglows Kawasan 17	Residential
N33	Hospital KPJ Klang	Hospital
N34	Lorong Mahkota 2d	Residential
N35	Flat Mawar	Residential
N36	SMK Hwa Kua	School
N37	Apartment Pelangi	Residential
N38	Jalan Pekan Baru 38	Commercial
N39	Jalan Kelicap 41	Residential
N40	Jalan Kelicap 45	Residential
N41	Jalan Meru 1	Residential
N42	SMK Meru	School
N43	SK Jalan Meru	School
N44	Pangsapuri Perumahan MPK	Residential
N45	SMK Convent	Residential
N46	Jalan Jelutong	School
N47	Sekolah Khas Klang	School
N48	Masjid Al-Rahimah	Worship place
N49	Hospital Besar Tengku Rahimah	Hospital
N50	Jalan Sri Siantan 43	Residential
N51	Jalan Langat	Residential
N52	Jalan Sri Sarawak 1	Residential
N53	Jalan Serunai 3	Residential
N54	BBt Hotel	Hotel
N55	Jalan Gambus 2	Residential
N56	Jalan Gambus 3/Jalan Solok Gambus 4a	Residential
N57	Klinik Kesihatan Bandar Botanik	Clinic
N58	Hotel 99, Bandar Botanik/Jalan Cassia	Residential
N59	Bandar Park Land/Bayuemas	Residential
N60	Taman Johan Setia Permai	Residential

b) Water Quality Monitoring

Water quality will be measured at various locations during the construction stage. At this stage, water quality monitoring is proposed to be monitored at the locations tabulated in **Table 9-4** and shown in **Figure 9-1a, 9-1b & 9-1c**.

Table 9-4 Provision Locations of Water Sampling

Station	River	Description	Coordinates
W1	Sg Kayu Ara (Point 1)	Near the residential area of Damansara Utama (SS 21)	N 3° 08' 41.9" E 101° 37' 9.5"
W2	Sg Kayu Ara (Point 2)	Near the residential area of Taman Kayu Ara Indah	N 3° 08' 7.6" E 101° 36' 59.7"
W3	Sg Kayu Ara (Point 3)	Adjacent to Taman Megah Emas residential area	N 3° 6' 39" E 101° 35' 37.4"
W4	Sg Damansara	Along Persiaran Sukan near the Giant Hypermarket Seksyen 13	N 3°5' 11.5" E 101° 33' 5.6"
W5	Sg Renggam	Located near the proposed alignment along Persiaran Dato' Menteri and adjacent to SIRIM	N 3° 4' 7.1" E 101° 31' 0.5"
W6	Sg Rasau	Located in front of the SJK (T) Ladang Midlands	N 3° 4' 6.3" E 101° 29' 17.2"
W7	Sg Klang	Located near the KTM Depot	N 3° 2' 20.9" E 101° 27' 20.5"
W8	Sg Aur	Located near Taman Desawan residential area	N 3° 00' 1.7" E 101° 26' 32.9"
W9	Parit Johan Setia	Located adjacent to Kota Bayuemas	N 2°58' 45.9'' E 101° 27' 32.9"

The monitoring frequency will be **monthly**. The parameters to be analysed include:

- pH
- Heavy metals
- BOD
- Ammoniacal nitrogen
- COD
- DO
- TSS
- Oil and Grease

Specific water quality monitoring locations for other construction works will be determined at the Master EMP or Site Specific EMP preparation.

c) Silt Trap Discharge Monitoring

Silt trap discharge will be measured at launch shafts and depots. The monitoring frequency will be monthly. The parameters to be analysed is TSS. The proposed silt trap discharge locations as proposed in the ESCP are as follows:

- Johan Setia Depot

The provisional locations of silt trap discharge for the depot are shown in **Figure 9-2.**

- Elevated and Underground Works

The final discharge from the sediment treatment plant will be sampled and analyzed for TSS and turbidy levels.

d) Air Quality Monitoring

The main air pollutants that would be emitted during the construction stage are particulates from earthworks, vehicle and machinery engine exhaust and movement of construction vehicles. Other gaseous pollutants will also be emitted, although at levels that are expected to be low.

The provisional locations of air quality monitoring are shown in **Table 9-5** and **Figure 9-1a, 9-1b & 9-1c,** which are the same as the baseline monitoring stations.

Table 9-5 Provision Locations For Air Quality Monitoring

Station	Description	Coordinates
A1	Surau Darul Falah, Jalan Tanjung	N 3° 8'8.32" E 101°37'1.34"
A2	Open space at Shell (Nearby Taman Damansara Lagenda Puteri 3)	N 3°7'24.46" E 101°35'39.03"
A3	Open space adjacent to Syarikat SRS Bumimotors Sdn Bhd, Jalan Kerjaya, Glenmarie	N 3°5'28.71" E 101°34'43.6"
A4	Nearby D' Kayangan residential	N 3° 4'41.74" E 101°32'28.99"
A5	Park adjacent to SJK (Tamil) Ladang Midlands	N 3° 4'3.50"E 101°29'13.48"
A6	Playground at Jalan Kelicap	N 3° 3'40.75" E 101°27'12.64"

SECTION 9 : ENVIRONMENTAL MANAGEMENT FRAMEWORK

Table 9-5 Provision Locations For Air Quality Monitoring (Cont'd)

Station	Description	Coordinates
A7	Open space nearby Petronas station and Masjid Al-Rahimiah (Opposite Hospital Tengku Ampuan Rahimah, Klang)	N 3° 1'15.99" E 101°26'32.89"
A8	Taman Johan Setia	N 2° 58'40.15" E 101°27'59.7"
A9	Sekolah Sri Acmar Football Field	N 3° 3'41.11" E 101°27'44.87"
A10	Klang Municipal Council (MPK) Quarters	N 3° 2'28.08" E 101°26'30.18"

The monitoring frequency will be quarterly. The parameters to be analysed include:

- TSP
- NO_x
- CO

At this stage, it is not possible to identify specific air quality monitoring locations along the alignment. The exact location of the air quality monitoring locations will be determined at the Master EMP or Site Specific EMP preparation.

9.7 LABORATORY

All field sampling shall be carried out by trained field personnel and the samples shall be analysed in an accredited laboratory. All samples collected during monitoring will be sent to a laboratory accredited to the "Skim Akreditasi Makmal Malaysia".

The results from the laboratory shall be signed by a registered chemist. The analytical methods used shall be in accordance to the latest edition of "Standard Methods for the Analyses of Water and Wastewater" as required under the Environmental Quality Act 1974.

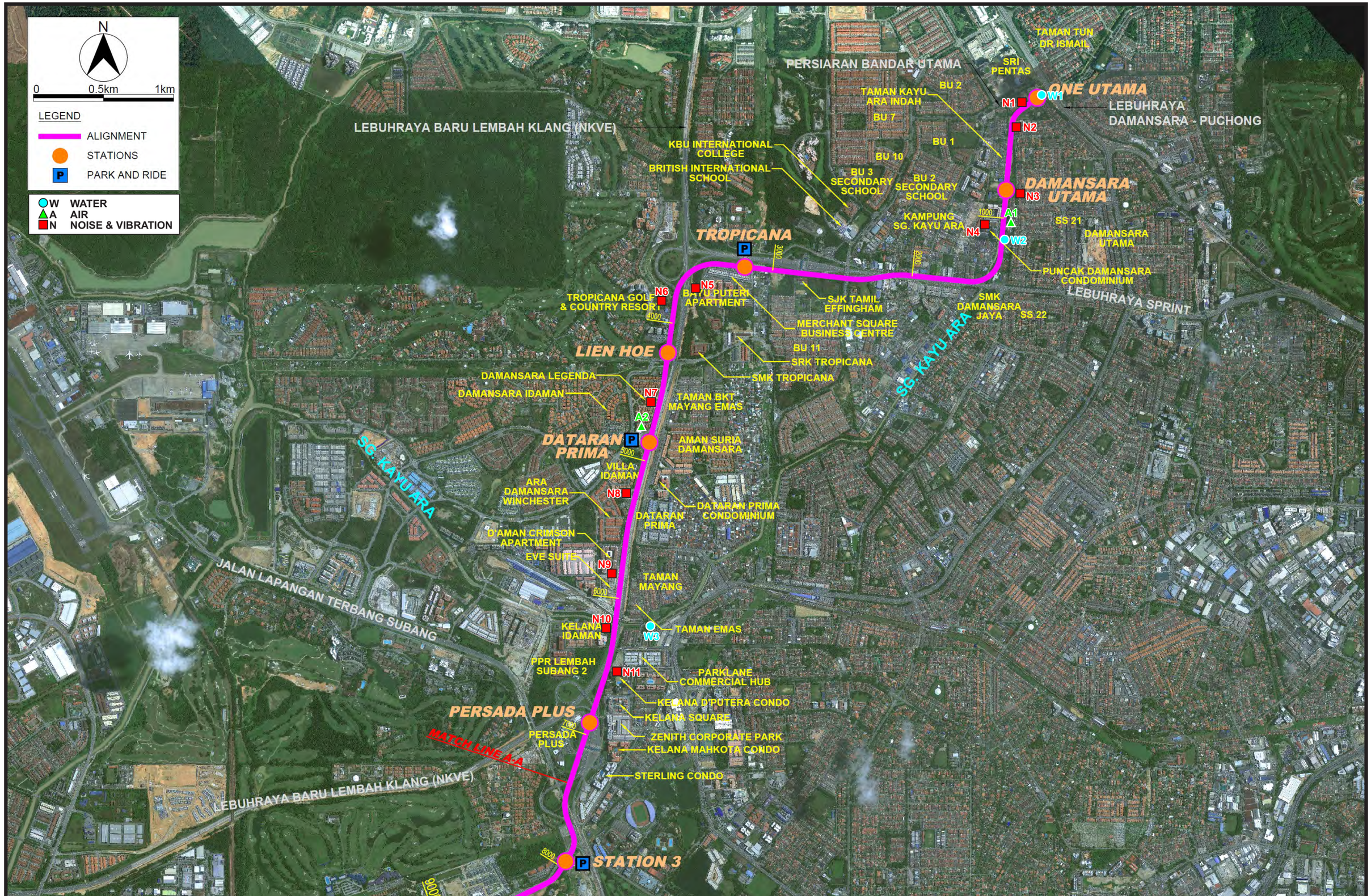
9.8 EMERGENCY RESPONSE PLAN

Emergency Response Plan (ERP) is a plan to tackle emergencies that may occur within the Project site. This will enable lives to be protected and damages to be kept to a minimum in the event of an emergency. The emergency response plan also serves as a guide to the workers and all key personnel at the Project site to respond to any emergencies in an orderly, effective and systematic manner.

The ERP should be made known and available to all workers who in turn should become familiar with its various procedures. Key personnel should know and understand their responsibilities as well as coordinate their response actions with their subordinates. As stated in **Section 6.4.3**, a Central Safety and Health Committee is proposed to coordinate and implement the Project Safety and Health Plan. Another important aspect is to include stakeholder participation for the formulation of ERP since major portion of construction works will take place within public areas, highly populated areas or areas with high road users.

As part of the environmental management framework, the EM Unit of the PDP shall establish an emergency response plan for the following incidents and those activities identified as high risk :

- Fires or Explosion
- Spillage
- Medical
- Traffic Accidents
- Flooding
- Tunnel Collapse and/or excavation works
- Elevated works (scaffolding erection, gantry launching and SBG launching)



ere consulting group	Figure 9-1a	Proposed Locations of Environmental Monitoring along Segment 1 : One Utama Station - Persada PLUS Station

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ere consulting group sensible environmental solutions	Figure 9-1b	Proposed Locations of Environmetal Monitoring along Segment 2 : Station 3 Station - Bukit Raja Station

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N

0 0.75km 1.5km

LEGEND

ALIGNMENT

STATIONS

PARK AND RIDE

W WATER
A AIR
N NOISE & VIBRATION

LEBUHRAYA SELAT KLANG
SG. RASAU
PKNS APARTMENT
PERSIARAN PERMAI
BUKIT RAJA SELATAN INDUSTRIAL AREA
N29
I-CITY
N30
N31
PALM GARDEN APARTMENT
SM KWANG HUA
PELANGI COURT
KAWASAN 17
KLANG PARADE
TAMAN PERINDUSTRIAN BUKIT RAJA
KAWASAN 17
N37
N35
N36
N38
N39
N40
A6
N34
N33
N32
BUKIT RAJA
I-CITY
COMMERCIAL SEKSYEN 7
SMK MERU
CHINESE GRAVEYARD
SMK TINGGI KLANG
N41
N42
N43
TAMAN ENG ANN
A9
BANDAR BARU KLANG
KPJ MEDICAL CENTRE
SRI ACMAR SCHOOL
TAMAN MERU KLANG
TAMAN WORTHINGTON
LEBUH KELILI
JALAN MERU
JALAN KAPAR
JALAN MERU
KLANG TOWN CENTRE
LEBUHRAYA PERSEKUTUAN
MAJLIS PERBANDARAN KLANG
SMK METHODIST GIRL SCHOOL
KLANG DISTRICT OFFICE
SMK METHODIST ACS
N44
A10
NEW KLANG DISTRICT OFFICE COMPLEX
N45
PERSIARAN SULTAN IBRAHIM
KLANG (TOWN)
KTMB KLANG STATION
KAWASAN 1
SCOKLANG
W7
MASJID INDIA KLANG
JALAN TENGKU KELANA
SK/SMK CONVENT 1 & 2
TAMAN BANDAR DIRAJA KLANG
BULATAN SIMPANG LIMA
PERSIARAN RAJA MUDA MUSA
N46
TAMAN SELATAN
TAMAN SELATAN
TAMAN CHI LIUNG
SEKOLAH KHAS KLANG
TAMAN PALM GROVE
N47
TANAH PERKUBURAN ISLAM LIPAT KAJANG, KLANG
A7
HOSPITAL TENGKU AMPUAN RAHIMAH
N48
N49
MASJID JAMEK AL-RAHIMAH
N50
N51
TAMAN SRI ANDALAS
BAYU PERDANA
SRI ANDALAS
JALAN BATU UNJUR
N52
TAMAN BAYU TINGGI
TAMAN DESA UTAMA
N53
JALAN LANGAT
N54
TESCO BUKIT TINGGI
TESCO BKT TINGGI
BANDAR BUKIT TINGGI 1
N55
TAMAN DESAWAN
N56
W8
BANDAR BOTANIK
BANDAR BUKIT TINGGI 2
AEON BKT TINGGI
AEON BUKIT TINGGI SHOPPING CENTRE
KLANG DISTRICT HEALTH OFFICE COMPLEX
N57
N58
BANDAR BOTANIC CAPITAL
BANDAR BOTANIK
LEBUHRAYA KESAS
JALAN KLANG - BANTING
W9
JALAN JOHAN SETIA
N60
A8
KOTA BAYUEMAS
N59
JOHAN SETIA
BANDAR PARKLANDS

Figure 9-1c

Proposed Locations of Environmental Monitoring along Segment 3 : Kawasan 17 Station - Johan Setia Station

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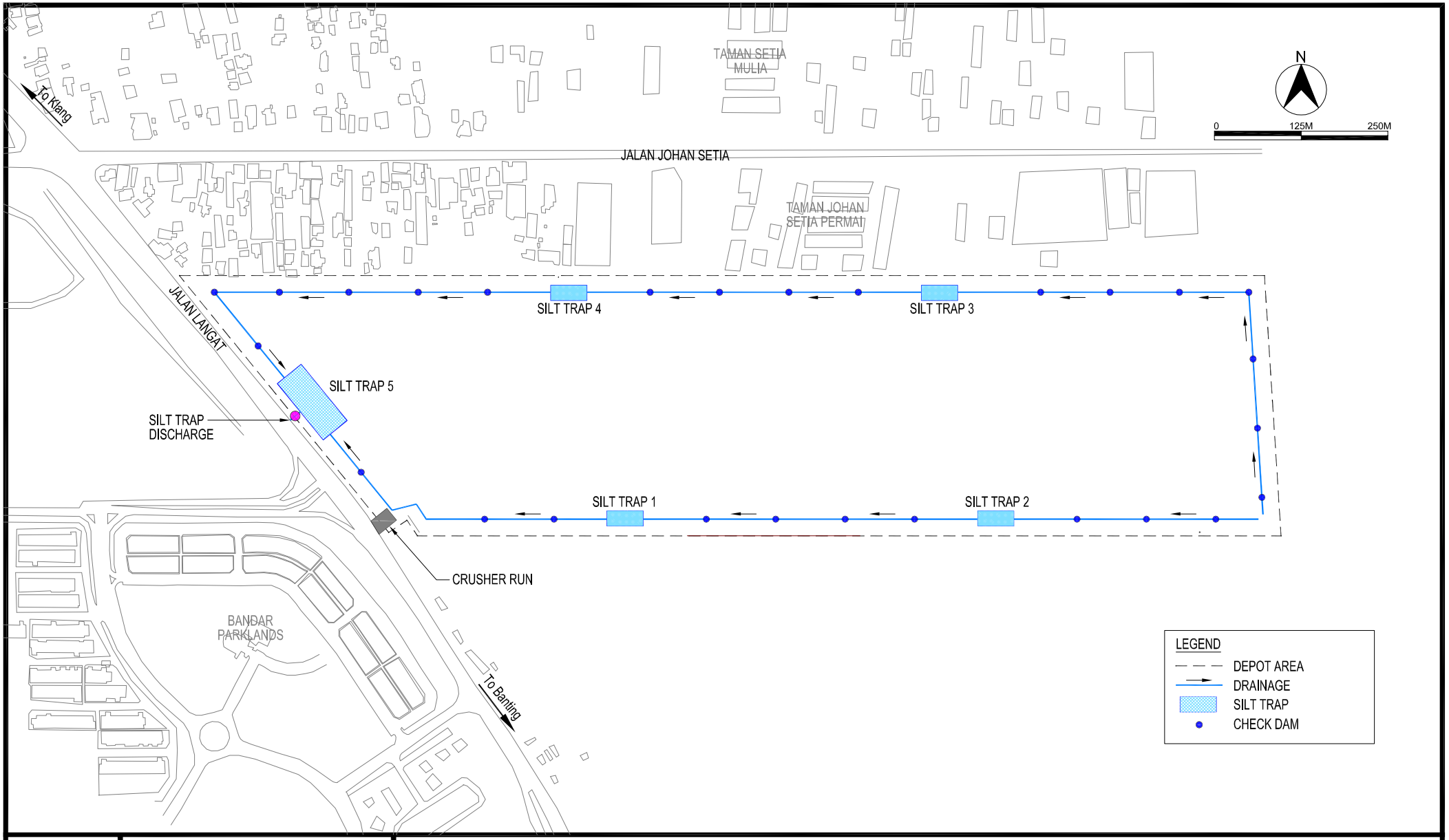

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Figure 9-2

Silt Trap Monitoring at Depot

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