



LEMBAGA URUS AIR
SELANGOR (LUAS)

LEMBAGA URUS AIR SELANGOR

LUAS



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AIR SELANGOR (LUAS)

THE 6th GENERAL MEETING NARBO

**HYBRID OFF RIVER AUGMENTATION SYSTEM (HORAS) PROJECT
AND PUMPING OPERATION FROM ALTERNATIVE PONDS TO
SELANGOR RIVER (OPAK)
22 – 24, FEBRUARY 2017**





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BACKGROUND OF HYBRID OFF RIVER AUGMENTED STORAGE (HORAS) PROJECT

- Selangor Water Management Authority (SWMA) was tasked to identify and develop alternative water resources from ponds, lakes, former mining ponds and groundwater to overcome water supply shortage during dry season in the State of Selangor.
- A feasibility study on the existing tailing tin mining ponds in Bestari Jaya of Selangor River catchment as flood detention and water storage ponds was carried from 2012 to December 2013.
- A Hybrid Off River Augmented Storage (HORAS) scheme was proposed in the report and was agreed to be implemented by the Selangor State Government.
- The first HORAS project (HORAS 600) is currently under construction. When completed, it will be capable of supplying 600 Million Litres per Day (MLD).



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(CONTINUED)

- The second HORAS project (HORAS 3000) is currently in the planning stage. When completed, it will be capable of supplying 3,000 Million Litres per Day (MLD). The total land area involved is about 4,200 hectares.
- Both HORAS schemes can supply a total of 3,600 MLD when completed.
- The HORAS project will increase the yield and storage of water resource of the State of Selangor and mitigate flooding in downstream areas in Bestari Jaya.
- The HORAS project can also be used in an emergency for the dilution of pollution of the Selangor River and reduction of turbidity through a sedimentation pond. Thus shutdown of treatment plants can be avoided when there is a pollution incident.

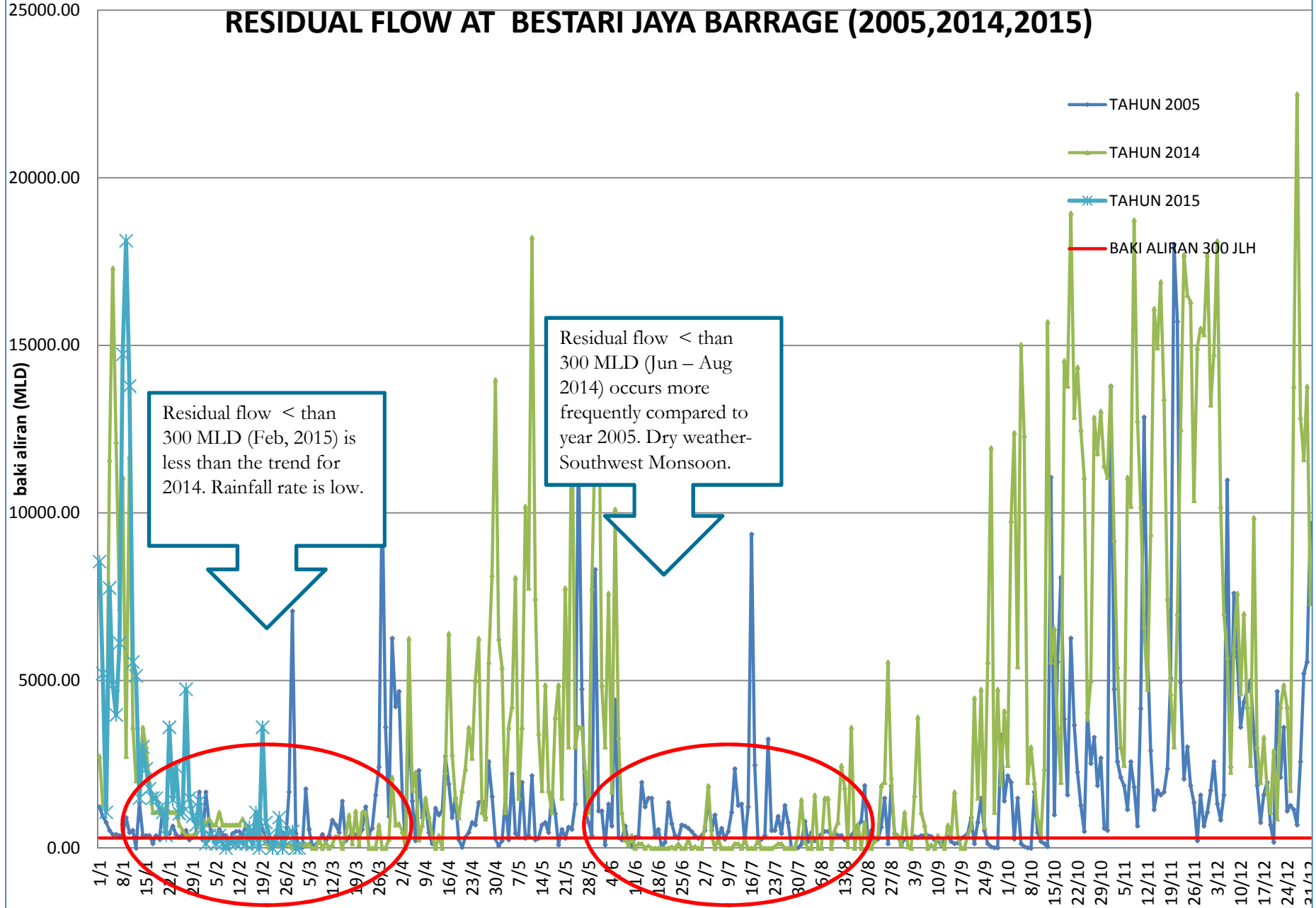


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FLOOD FLOW AT SELANGOR RIVER

- Based on the National Water Resources Study (2000-2050), a hydrological analysis was carried out. From the analysis, the flood flow rate at Selangor River Station (Department of Irrigation Station, Rantau Panjang) for duration of 50 years (1960-2010) are as follows:
 - i) 1 : 50 ARI (Average Recurrence Interval) is 461 m³/s (39,830 MLD)
 - ii) 1 : 100 ARI is 541 m³/s (46,742 MLD).
 - iii) 7 day low flow is 9.856 m³/s (851 MLD).
- The above flows shows that there are excess river flow that can be diverted for storage at the Selangor River.

RESIDUAL FLOW AT BESTARI JAYA BARRAGE (2005,2014,2015)





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PROPOSED HORAS 3000 PROJECT

- Construction of the HORAS ponds is to be implemented in stages (divided into 4 phases) where 5 ponds will be constructed.
- Yield that can be abstracted from the HORAS ponds is estimated from 2,000 million litres per day (MLD) to 3,000 MLD.
- LUAS proposed that the HORAS project is capable of supplying up to 3,000 MLD.



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PROPOSED HORAS 3000 PROJECT (CONT'D)

- Depth of the ponds is between 5m to 15m and there is also depth that reaches into the aquifer layer (20m).
- The project area is 4,200 ha and total ponds area will be 3,763 ha.
- The catchment area upstream of the HORAS ponds is 1,504 km². Total water volume of the ponds is 560 million m³.
- The entire area of the Bestari Jaya ponds with area of 4,451.3 hectares (10,999.4 acres) have been gazetted as a Protection Zone under Section 48 LUAS Enactment 1999 under Gazetted Plan 1646 on 10 September 2014.



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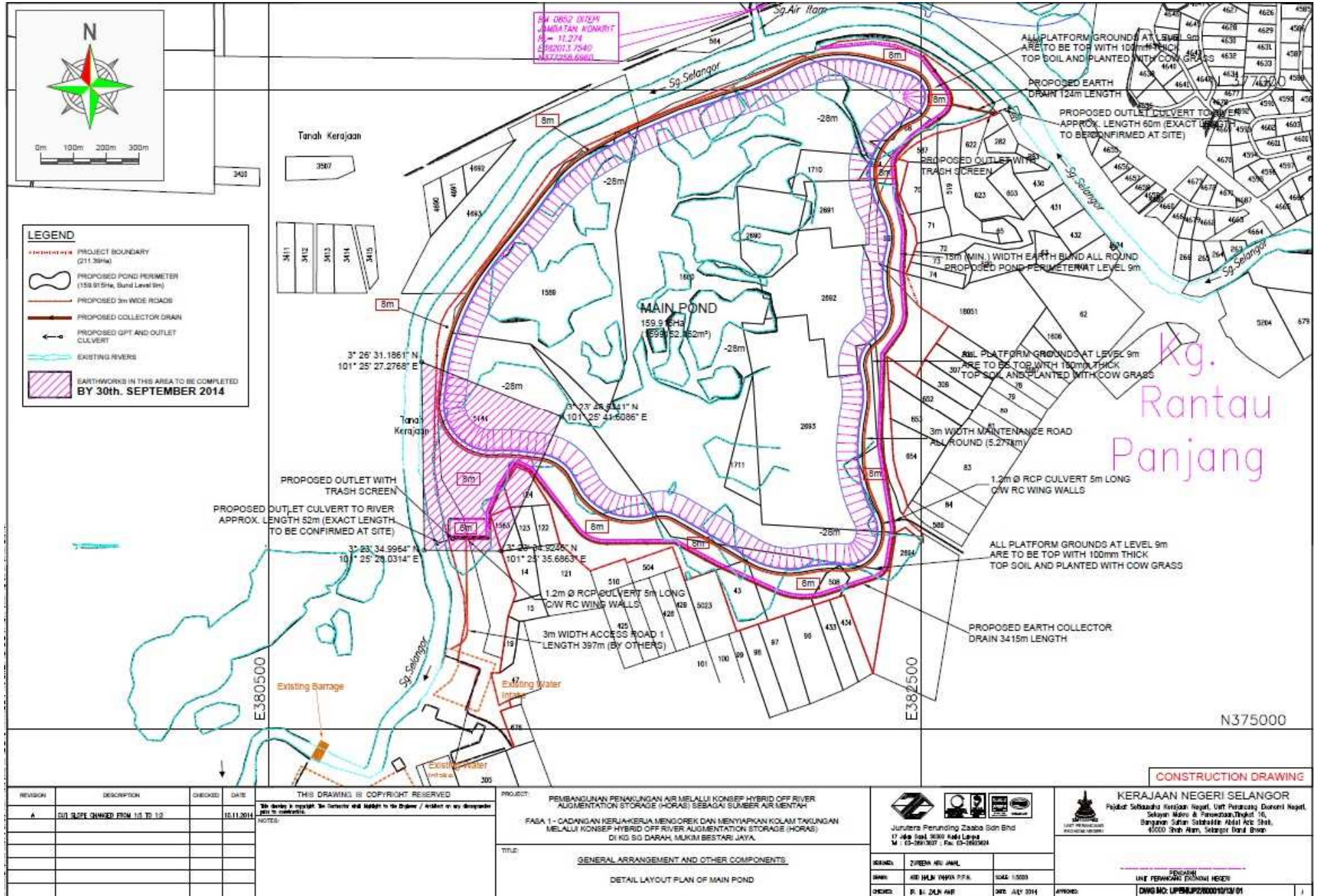
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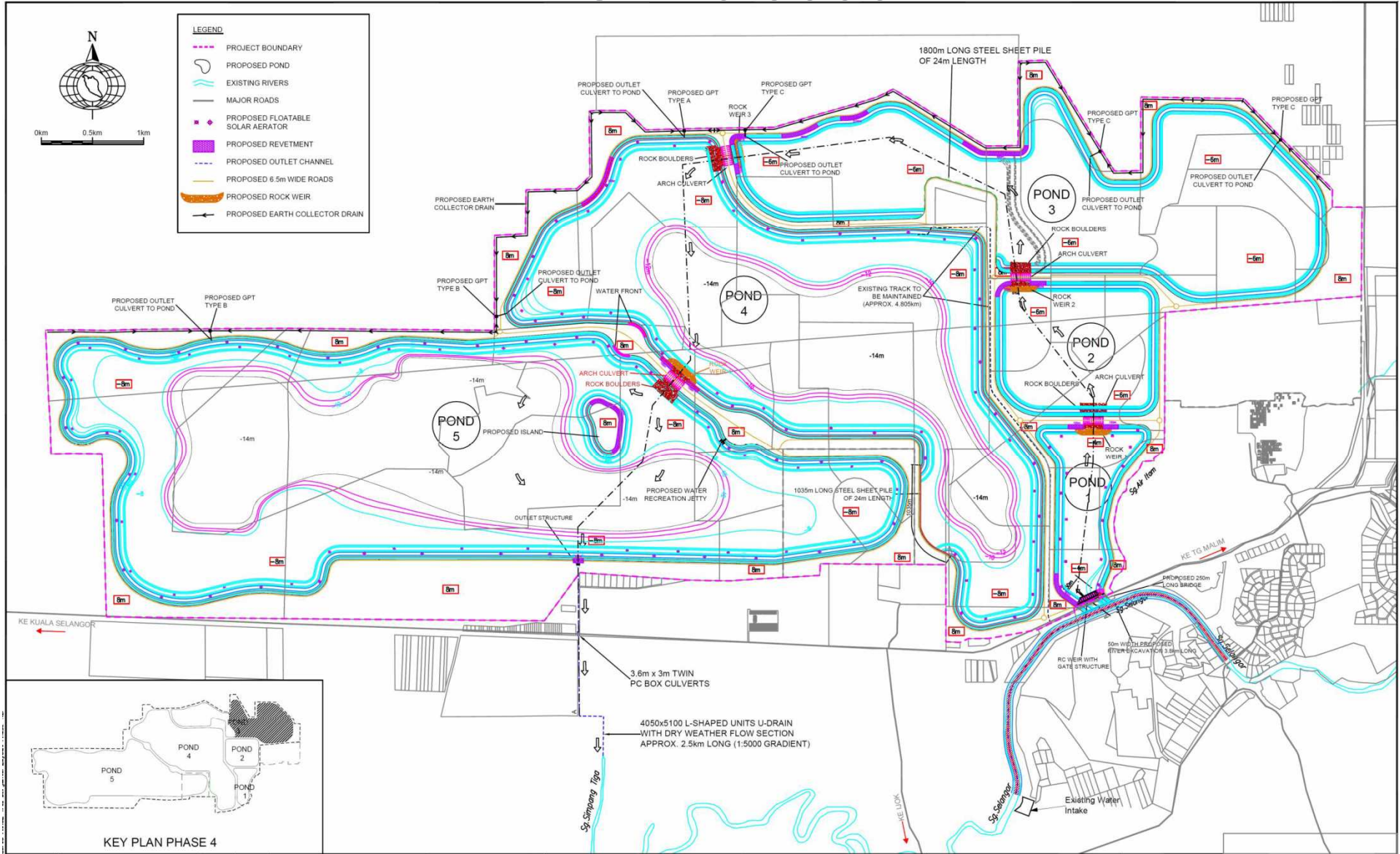
Table of Area and Total Volume of Ponds in HORAS 3000 Area

Pond	Area (Ha)	Volume (juta m ³)
Pond 1	114	11.69
Pond 2	205	20.06
Pond 3	684	90.06
Pond 4	1,067	174.16
Pond 5	1,693	262.83
TOTAL	3,763	558.80

HORAS 600



HORAS 3000



REVISION	DESCRIPTION	CHECKED	DATE	NOTES

PROJECT:
KAJIAN KOLAM BEKAS LOMBONG SEBAGAI KOLAM TAKUNGAN ALIRAN AIR BANJIR DI LEMBANGAN SUNGAI SELANGOR

TITLE:
**PHASE 4
 LAYOUT PLAN OF PROPOSED PONDS
 PHASE 4**

LEMBAGA URUS AIR SELANGOR (LUAS)
 Tgkt. 12&13, Bangunan Darul Ehsan
 No. 13, Jalan Indah, Seksyen 14
 40000 Shah Alam, Selangor Darul Ehsan

Jurutera Perunding Zaaba Sdn Bhd
 17 Jalan Damak, 60300 Kuala Lumpur
 Tel : 03-28913007 ; Fax : 03-28925624

DESIGNER: **IR. ALIAS HASHIM**
 DRAWN: **ABD MALIM YAMAYA P.P.N.** SCALE: 1:7000
 CHECKED: **IR. ZALRI AMR** DATE: NOVEMBER 2013 APPROVED:

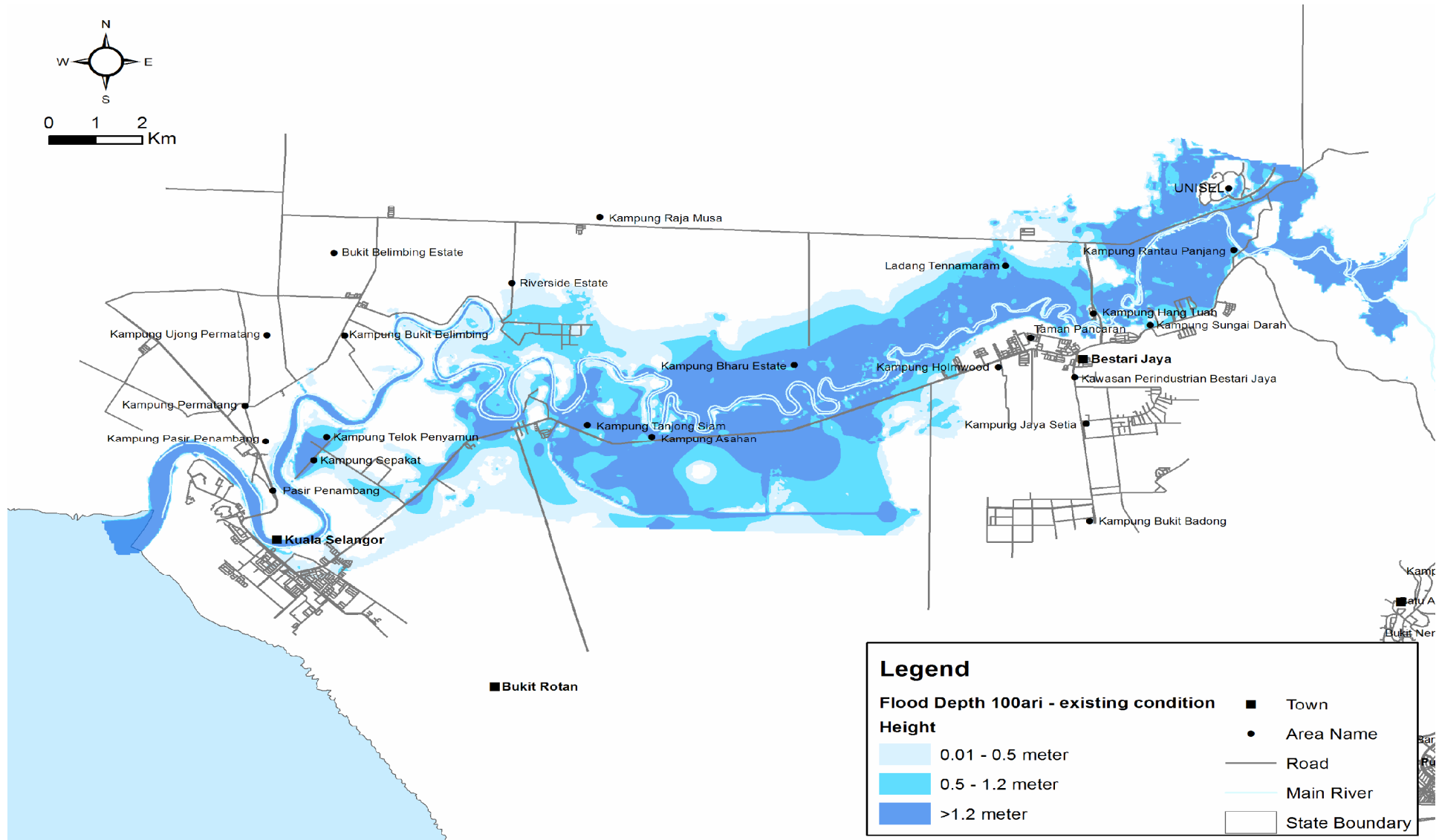
PENGARAH LEMBAGA URUS AIR SELANGOR (LUAS)	DWG NO: LUAS/JZ5103/12/01
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EXISTING FLOOD RISK PLAN MODEL



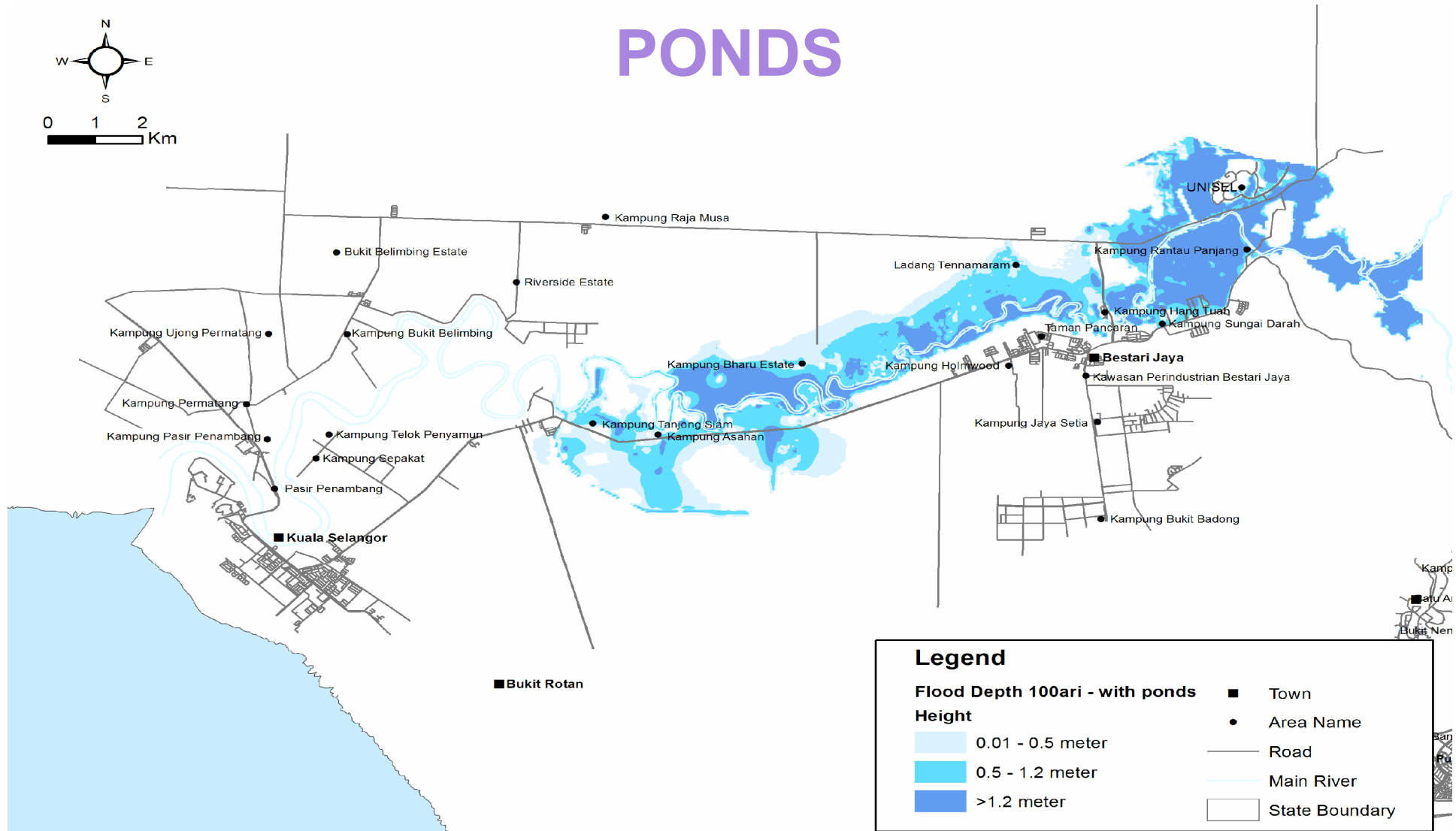


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FLOOD RISK PLAN MODEL WITH PROPOSED OFF RIVER STORAGE PONDS





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OBJECTIVE AND IMPORTANCE OF HORAS PROJECT

- To increase yield and raw water storage of the State of Selangor during dry season or low river flow.
- To reduce the dependency of water resource from water release from dams and river flow.
- To mitigate the effects of flooding at downstream areas at Bestari Jaya.
- To be used as an emergency water source during droughts.
- The HORAS project can also be used in a emergency for the dilution of pollution of the Selangor River and reduction of turbidity through a sedimentation pond. Thus shutdown of treatment plants can be avoided when there is a pollution incident.



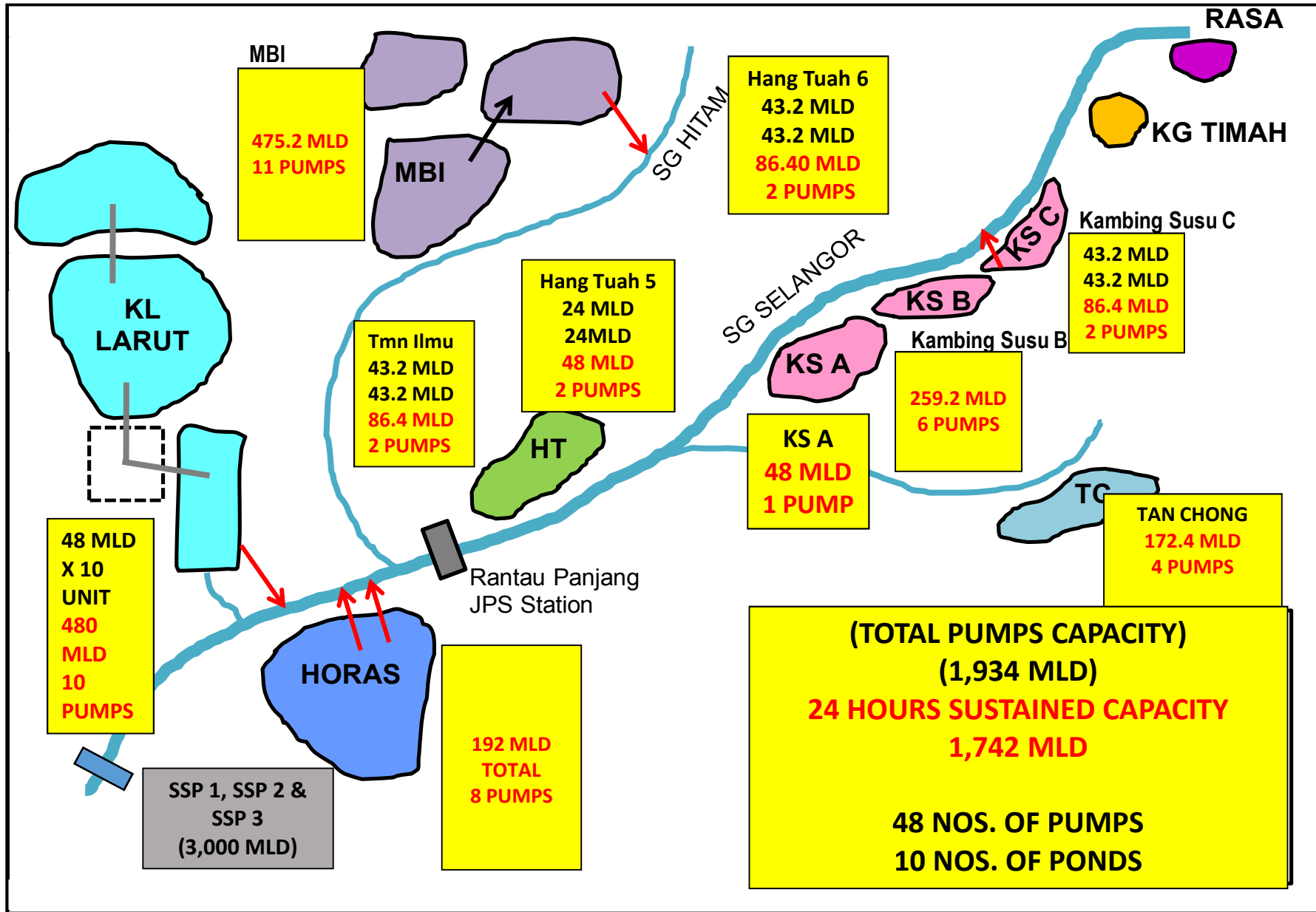
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PUMPING OPERATION FROM ALTERNATIVE PONDS TO SELANGOR RIVER (OPAK)

- An operation to pump raw water from alternative ponds along the Selangor River was implemented from June 2014 to date (2017) to supplement the raw water supply to the intakes during the dry season.
- In 2016, this operation was proven to mitigate the effects of El Nino in the State of Selangor.
- Some of the ponds are part of the HORAS project.
- 48 nos. of pumps are used with a total pumping capacity of about 1,900 MLD.
- The pumping operation is necessary in order to avoid water rationing in the State of Selangor.



PUMPING OPERATION FROM ALTERNATIVE PONDS TO SELANGOR RIVER FOR THE YEAR 2017



1. KL Larut Pond - 10 pumps by Selangor Department of Irrigation and Drainage

PUMPING OPERATION FROM ALTERNATIVE PONDS TO SELANGOR RIVER FOR THE YEAR 2017



2. Hang Tuah 5 Pond (HT5) - 2 pumps by KSSB

PUMPING OPERATION FROM ALTERNATIVE PONDS TO SELANGOR RIVER FOR THE YEAR 2017



3. Hang Tuah 1,2,3 & 4 Ponds (HT)

PUMPING OPERATION FROM ALTERNATIVE PONDS TO SELANGOR RIVER FOR THE YEAR 2017



3. Hang Tuah 6 Pond (HT6) - 2 pumps by KSSB

‘OFF RIVER STORAGE’ (ORS) HANG TUAH



PUMPING OPERATION FROM ALTERNATIVE PONDS TO SELANGOR RIVER FOR THE YEAR 2017



4. HORAS 600 Pond - 8 pumps by KSSB

PUMPING OPERATION FROM ALTERNATIVE PONDS TO SELANGOR RIVER FOR THE YEAR 2017



5. MBI Pond - 11 pumps by KSSB

PUMPING OPERATION FROM ALTERNATIVE PONDS TO SELANGOR RIVER FOR THE YEAR 2017



6. Taman Ilmu Pond - 2 pumps by KSSB

PUMPING OPERATION FROM ALTERNATIVE PONDS TO SELANGOR RIVER FOR THE YEAR 2017



7. Kambing Susu A Pond - 1 pumps by KSSB

PUMPING OPERATION FROM ALTERNATIVE PONDS TO SELANGOR RIVER FOR THE YEAR 2017



8. Kambing Susu B Pond - 6 pumps by KSSB

PUMPING OPERATION FROM ALTERNATIVE PONDS TO SELANGOR RIVER FOR THE YEAR 2017



9. Kambing Susu C Pond – 2 pumps by KSSB

PUMPING OPERATION FROM ALTERNATIVE PONDS TO SELANGOR RIVER FOR THE YEAR 2017



10. Tan Chong Pond - 4 pumps by KSSB



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CONCLUSION

- The Selangor Water Management Authority together with other Selangor State agencies are committed in supplying adequate and safe water resources for the requirements of residents of the State of Selangor.
- Initiatives that are being carried out are a commitment that sufficient water resources in the State of Selangor can be secured through efficient management of water resources.



THANK YOU

