



THE NEW WATER GOVERNANCE PARADIGM IN SELANGOR

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SELANGOR WATERS MANAGEMENT AUTHORITY (SWMA/LUAS)

10TH JUNE 2014
MALAYSIA WATER RESOURCES MANAGEMENT FORUM (MyWRMF)
PERBADANAN PUTRAJAYA





OUTLINE

1

- CURRENT SITUATION

2

- WATER MANAGEMENT FRAMEWORK

3

- STRATEGIES & PARADIGM SHIFT

4

- CONCLUSION



CURRENT SITUATION

- Memorandum of Understanding between the State of Selangor and the Federal Government on water industry in Selangor
- State of Selangor subsidiary company (KDEB) is to coordinate all treatment plant operators and water distributor
- Licensing of raw water abstraction is issued to KDEB
- Monitoring and water resources affairs remain under SWMA's jurisdiction



WATER MANAGEMENT FRAMEWORK

WATER RESOURCE

CATCHMENT AREA



WATER USERS

AQUACULTURE



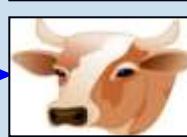
SEWERAGE



INDUSTRY



FARMING



USED WATER

RIVER



SOURCE



- SWMA
- DOE

CONSUMPTION

SOURCE



- SWMA
- DOE

JURISDICTION & WATER SUPPLY SERVICES FRAMEWORK

SELANGOR STATE GOVERNMENT

Dept of Environment
Waters Management
Authority (Luas)

Water Resources
(river, lake,
pond, ground
water, sea etc)

FEDERAL GOVERNMENT

National Water Services Commission (SPAN)

① Konsortium Abass Sdn Bhd (Semenyih Dam)

② Splash Sdn Bhd (Sg Selangor Dam)

③ Puncak Niaga Sdn Bhd (Others)

① Konsortium Abass Sdn Bhd

② Splash Sdn Bhd

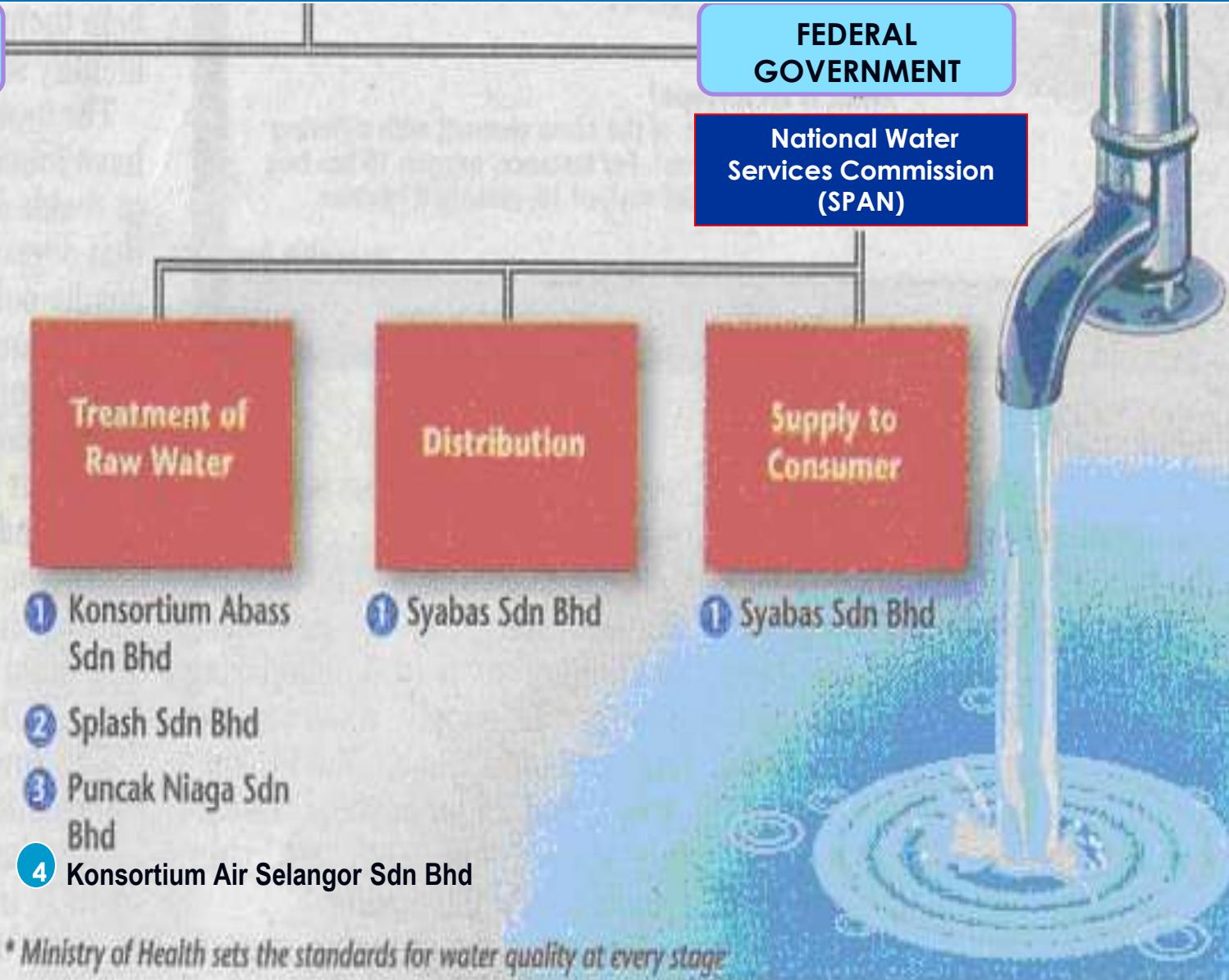
③ Puncak Niaga Sdn Bhd

④ Konsortium Air Selangor Sdn Bhd

① Syabas Sdn Bhd

① Syabas Sdn Bhd

* Ministry of Health sets the standards for water quality at every stage





STRATEGIES & PARADIGM SHIFT

- 1 • Intensify & strengthen monitoring and enforcement on water resources affairs through Water Resources Management Tools
- 2 • Utilizing & optimizing surface run-off/pond water through Alternative Water Resources Management
- 3 • Yearly Cautionary Cloud Seeding Initiative
- 4 • River Management Policy
- 5 • Zone of Protection Gazettement



INTENSIFY & STRENGTHEN MONITORING & ENFORCEMENT THROUGH WATER RESOURCES MANAGEMENT TOOLS

- a. Charging and Licensing of Water Abstraction, s.41(2)
- b. Written Approval of Alteration Activities, s.43(1)
- c. Licensing of Pollutant Discharges, s.79(1)
- d. Licensing of In Land Waterway Navigation, s.97(1)
- e. Licensing of Water Diversion For Hydro-Electricity, s. 42(3)
- f. Licensing of Water Recreational Activities, s. 98(1) – study stage

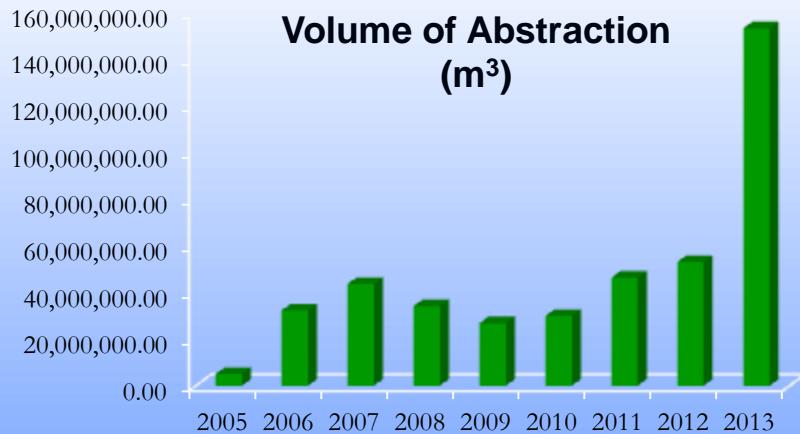
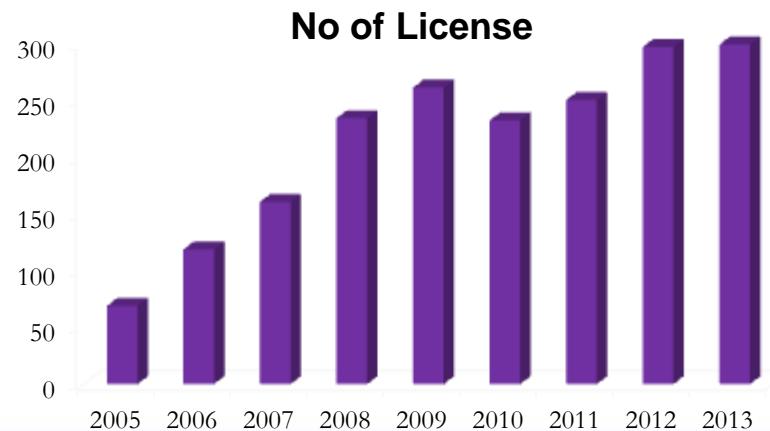
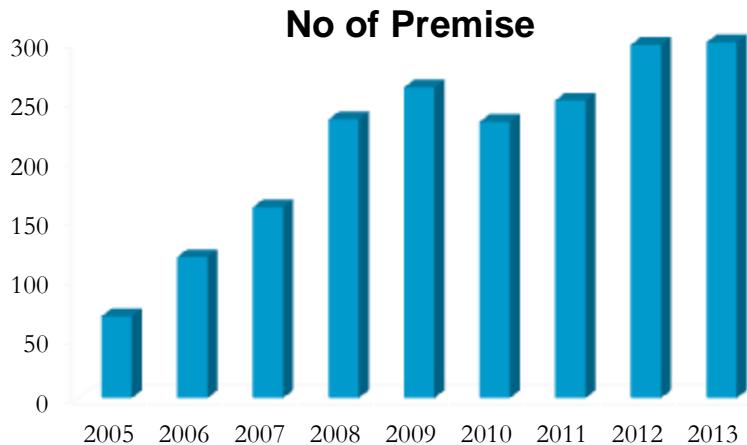


a. Licensing of Water Abstraction

- Charging and licensing of ground water and surface water abstraction was started on 1 July 2005 for water supply and commercial users.
- Parallel to Section 41(2), SWMA Enactment 1999.
- Charges rate are RM 0.01/m³ for public utilities and RM 0.05/m³ for commercial users.
- Water Resources Abstraction (State of Selangor) Regulation 2012 enforced to control water abstraction and to avoid any land subsidence, saline intrusion and also other impact to the environment.
- Numbers of license/premises and volume increased significantly every year.



LICENSING OF WATER ABSTRACTION (2005-2013)



Year	No Of Premise	No Of License	Volume of Abstraction (m³)
2005	45	69	5,033,467.20
2006	77	119	32,346,245.60
2007	101	161	43,731,303.00
2008	154	235	34,204,389.00
2009	163	262	26,877,113.80
2010	146	233	29,975,409.00
2011	183	251	46,455,440.20
2012	211	298	53,192,442.40
2013	220	300	153,658,495.00



b. Written Approval of Alteration Activities

- Activities related to water resources such as construction of jetty, bridges and other structures at/on/in river is referred to the Section 43(1), SWMA Enactment 1999.
- To protect and conserve the quantity and quality of water resources and to avoid any obstruction in the river.





IMPLEMENTATION , s.43(1)



**Proposal of details of activity.
Registration Fee RM150 (first time only)
License Fee : RM200, Charge Fee: Review**



Monthly report analysis



Analysis by accredited lab



Compliance to the imposed terms and conditions



LEMBAGA URUS AIR SELANGOR

LEMBAGA URUS AIR SELANGOR (LUAS)

WRITTEN APPROVAL FOR ALTERATION ACTIVITIES (S43 & S70)



Bridge



Sand Mining



River Diversion



WRITTEN APPROVAL FOR JETTY ACTIVITY



LKC JETTY



LION WATERWAYS JETTY

Operator	Tonnage /month	Charge /year
Lion Waterway	63,000	RM0.25/tonne
LKC	18,000	RM 0.35/tonne



- **The State Council Meeting has approved that any application and jetty related matters is to be reviewed by the State of Selangor Jetty Management Committee chaired by SWMA.**
- **To utilize and optimize the existing jetty and to control new development of jetty which pose impact to the water resources.**



c. Licensing of Emission or Discharge Of Pollutant

- Regulation which is parallel to Section 79(1), SWMA Enactment 1999 enforced on 20 April 2012.
- To control the effluent quality discharged to the water resources.
- Review and expansion of scheduled activities to other potential pollution activities.

The image shows a newspaper clipping from 'NEW SUNDAY TIMES' with the headline '228. Govt. Notices/Tenants'. The notice is from Lembaga Urus Air Selangor (LUAS) and is titled 'PEMAKLUMAN RASMI' (Official Notice). It announces the enforcement of new regulations regarding the discharge of pollutants into water bodies in Selangor. The notice specifies that the regulations came into effect on 20 April 2012 and lists various types of activities that fall under the new rules, such as industrial processes, mining, quarrying, construction, and land reclamation. It also provides information on how to apply for permits and the consequences of non-compliance.

PEMAKLUMAN RASMI

PELAHIRAN PERATURAN BARU BERKAITAN
PENCEMARAN DI NEGERI SELANGOR

1. Berikut diakta dan peraturan yang berlaku di Negeri Selangor mengikut undang-undang Peraturan-Peraturan Kawasan dan Pelupusan Bahan Pemcam Negeri Selangor 2012 telah diberlakukan di Negeri Selangor:
 - (i) Aktifiti industri dan pertanian yang dilakukan;
 - (ii) Aktifiti urang batu dan tanah;
 - (iii) Penambangan atau kerja tanah;
 - (iv) Pembinaan selain bina;
 - (v) Perubahan tanah;
 - (vi) Perubahan keadaan lembangan; dan
 - (vii) Semua bentuk pertambangan.
2. Setiap aktiviti tersebut hanya akan berlaku selepas ketentuan dan kriteria jasik di bawah dengan ditentukan. Setiap pelupusan bahan pemcam diluluskan setelah mendapat persetujuan dari unit teknikal terkait mengikut kriteria dan parameter yang telah ditetapkan. Setiap pelupusan diluluskan selepas mendapat persetujuan dan persetujuan yang dibatalkan.
3. Kepada mana-mana individu yang merupakan ahli atau ahli dalam Negeri Selangor adalah dilarang untuk mempunyai lesen daripada LUAS.
4. Setiap lesen dibentuk secara tertulis dan temu dan tentu oleh penyelaras dan PI lesen yang telah ditetapkan. Setiap perintah lesen boleh dimuat turun setara dengan daripada laman web LUAS di www.luas.gov.my atau pun melalui emelnya dan diajukan kepada LUAS.
5. Setiap tenaga kerja berkaitan dengan tenaga teknikal penyelaras dan PI lesen yang telah ditetapkan. Setiap perintah lesen boleh dimuat turun setara dengan daripada laman web LUAS di www.luas.gov.my atau pun melalui emelnya dan diajukan kepada LUAS.
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HAN MUJAHID BIN SELAMAT
Penyelaras,
Lembaga Urus Air Selangor,
25th, Mei 2012



IMPLEMENTATION, s.79(1)



Identifying final discharge point
Registration Fee RM150 (first time only)
License Fee : RM 650.00



Analysis report every 3 months



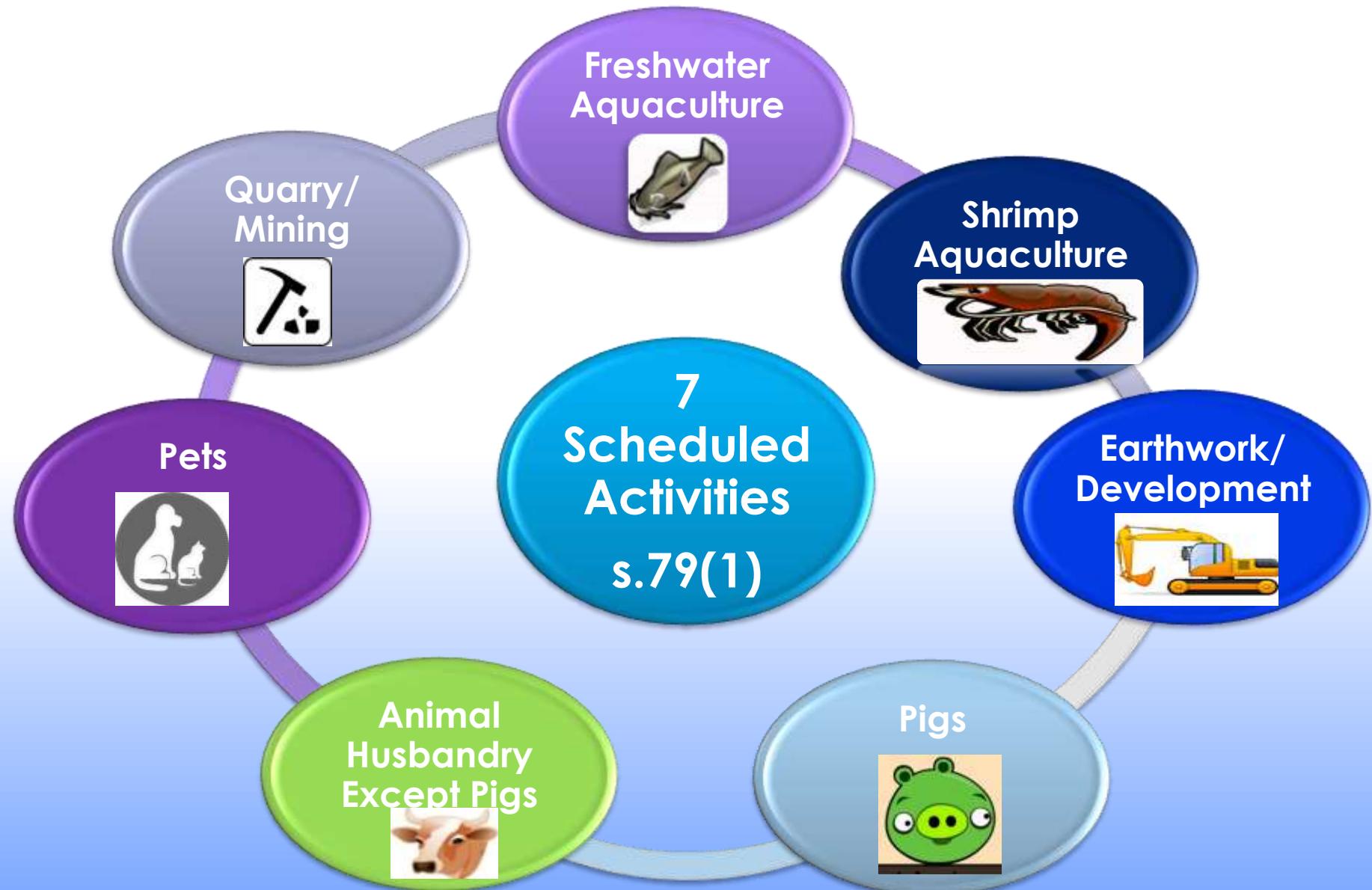
Analysis by accredited lab



Discharging with the permissible limit



CONTROLLED ACTIVITIES





DISCHARGE LIMIT OF ACTIVITIES

Type of Activity	Characteristics	Control parameter	Discharge Limit
	<ul style="list-style-type: none">➤ Fresh water aquaculture;➤ Cage or pond;➤ Area >50 ha.	<ul style="list-style-type: none">➤ AN➤ BOD➤ TSS➤ TN➤ TP	<ul style="list-style-type: none">➤ 5 mg/l➤ 50 mg/l➤ 100 mg/l➤ 10 mg/l➤ 1 mg/l
	<ul style="list-style-type: none">➤ Shrimp aquaculture;➤ Pond;➤ Area >10 ha.		
	<ul style="list-style-type: none">➤ Earthworks / development➤ < 50 ha;➤ Distance < 50 m from water source	<ul style="list-style-type: none">➤ TSS➤ O&G	<ul style="list-style-type: none">➤ 100 mg/l➤ 10 mg/l
	<ul style="list-style-type: none">➤ Pigs➤ Number ≥ 1 head.	<ul style="list-style-type: none">➤ AN➤ BOD➤ COD➤ TSS	<ul style="list-style-type: none">➤ 200 mg/l➤ 50 mg/l➤ 500 mg/l➤ 100 mg/l



DISCHARGE LIMIT OF ACTIVITIES...cont

Type of Activity	Characteristics	Control parameter	Discharge Limit
	<ul style="list-style-type: none"> ➤ Livestock ➤ With four legs ➤ Number >250 head. 	<ul style="list-style-type: none"> ➤ AN ➤ BOD ➤ COD ➤ TSS 	<ul style="list-style-type: none"> ➤ 200 mg/l ➤ 500 mg/l ➤ 500 mg/l ➤ 500 mg/l
	<ul style="list-style-type: none"> ➤ Livestock ➤ Bird ➤ Number >20,000 head 		
	<ul style="list-style-type: none"> ➤ Pets ➤ Number >20 head 	<ul style="list-style-type: none"> ➤ AN ➤ BOD ➤ COD ➤ TSS 	<ul style="list-style-type: none"> ➤ 300 mg/l ➤ 50 mg/l ➤ 500 mg/l ➤ 250 mg/l
	<ul style="list-style-type: none"> ➤ Sand mining ➤ Any quantity 	<ul style="list-style-type: none"> ➤ TSS 	<ul style="list-style-type: none"> ➤ 50 mg/l
	<ul style="list-style-type: none"> ➤ Quarry/Mining ➤ Area < 250 ha. 	<ul style="list-style-type: none"> ➤ O&G 	<ul style="list-style-type: none"> ➤ 1 mg/l



d. Licensing of In Land Waterway Navigation

■ Inland Waterway Navigation (State of Selangor)

Regulation 2012 parallel to the Section 97(1), SWMA Enactment 1999.

■ Enforced on 20 April 2012

■ To control navigational activities in the river.

The screenshot shows a news article from the NEW SUNDAY TIMES. At the top right, it says "228. Govt. Notices/Tenders". Below that is the LUAS logo. The main title of the article is "PEMAKLUMAN RASMI PELAKSANAAN PERATURAN BARU BERKAITAN NAVIGASI VESEL DI SUNGAI NEGERI SELANGOR". The article contains six numbered points detailing the regulation's requirements, such as the need for vessels to be registered and the requirement for operators to obtain a license. At the bottom, it says "Sekian, terima kasih." and "HAJI MD. KHAIRI BIN SELAMAT Pengarah, Lembaga Urus Air Selangor, 25hb. Mei 2012".



In Land Waterway Navigation Fee

Vessel
fee

RM150

+

Vessel
weight

0-500 ton RM500

501-1000 ton RM1000

1001-2000 ton RM2000

2001-3000 ton RM3000

3001-4000 ton RM4000

4001-5000 ton RM5000



e. Licensing of water diversion for hydro-electricity

- Charge rate is RM 50,000.00/MW generated and was enforced started on 11 Nov 2010.
- Parallel to Section 42(3), SWMA Enactment 1999.
- To control water diversion and maintain the ecological environment.

No. 3617.

PEMBERITAHUAN CAJ BAGI PELENCONGAN AIR
DARIPADA MANA-MANA SUMBER AIR.
NOTIFICATION OF CHARGES FOR DIVERSION OF WATER
FROM ANY WATER SOURCE

Pada menjalankan kuasa yang diberikan oleh subseksyen 44(1) Enakmen Lembaga Urus Air Selangor 1999 [En. 2/1999], Lembaga Urus Air Selangor, dengan kelulusan Pihak Berkuasa Negeri, dengan ini menetapkan kadar seperti yang dinyatakan dalam Jadual sebagai caj bagi pelencongan air daripada mana-mana sumber air bagi Negeri Selangor dan hendaklah berkuat kuasa pada tarikh ia disiarkan dalam Warta.

JADUAL

Tujuan Penggunaan
(1)

Penjanaan Elektrik

Caj (RM)
(2)

50,000.00/MW



Kerling River Mini Hydro
(SREP,2MW)



The concept of management through;

- water to water and Payment for Ecosystem*

- Integrated management across sectors



THE MECHANISM OF POLLUTION MONITORING BY SWMA

**IDENTIFYING THE RIVER BASIN ISSUES/
COMPLAINT**

SITE VISIT/INVESTIGATION

**RIVER
TASK FORCE
MEETING**

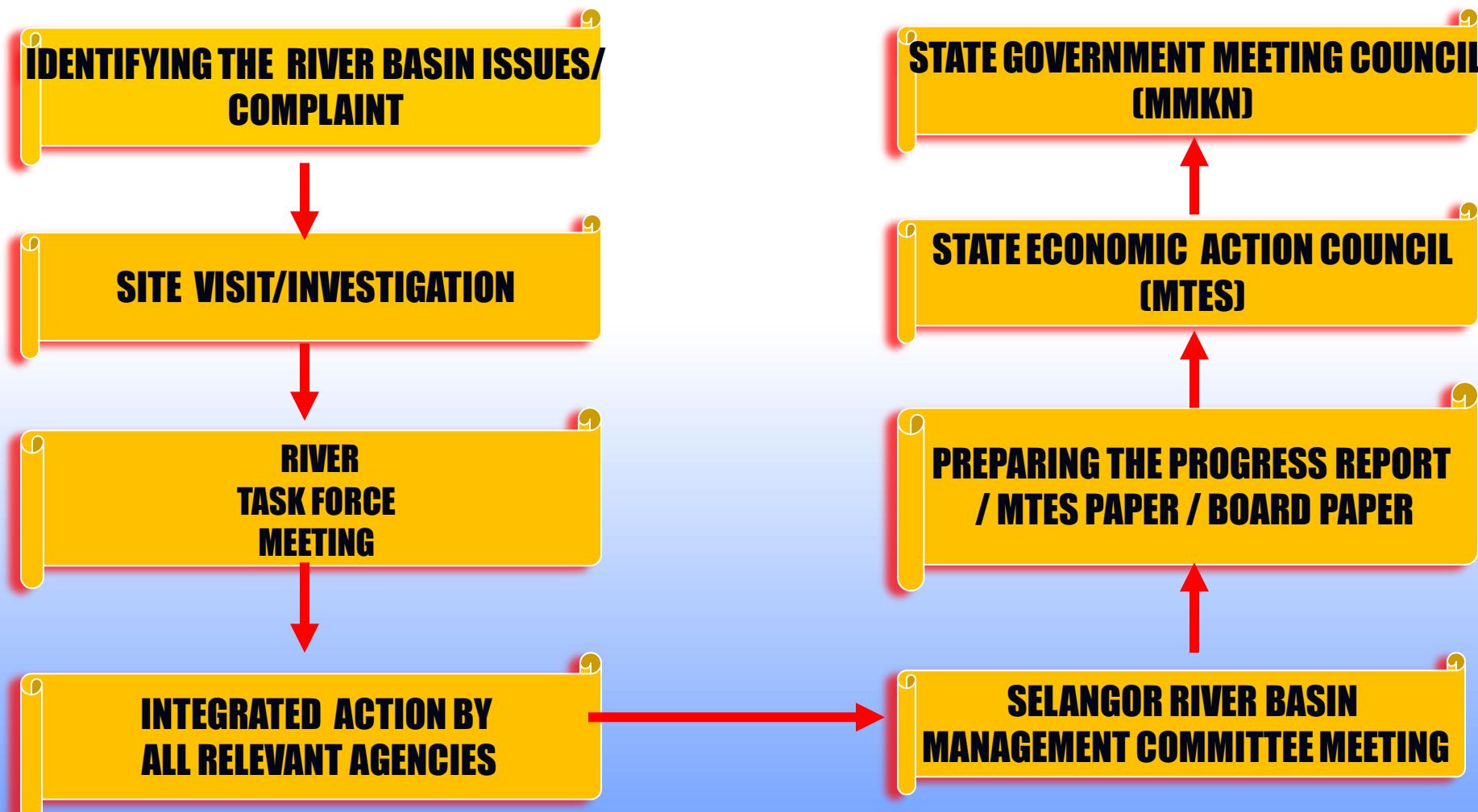
**INTEGRATED ACTION BY
ALL RELEVANT AGENCIES**

**STATE GOVERNMENT MEETING COUNCIL
(MMKN)**

**STATE ECONOMIC ACTION COUNCIL
(MTES)**

**PREPARING THE PROGRESS REPORT
/ MTES PAPER / BOARD PAPER**

**SELANGOR RIVER BASIN
MANAGEMENT COMMITTEE MEETING**





LEMBAGA URUS AIR SELANGOR

LUAS

LEMBAGA URUS AIR
SELANGOR (LUAS)

MONITORING AND CONTROL THROUGH COMPREHENSIVE DAM'S DATA & INFORMATION



Selangor River Dam



Semenyih River Dam



Online Dam Information and Monitoring

<http://iwrims.luas.gov.my>

Integrated Water Resource I...



Malay | English

LEMBAGA URUS
AIR SELANGOR (LUAS)**IWRIMS**

INTEGRATED WATER RESOURCE INFORMATION MANAGEMENT SYSTEM

PROFIL EMPANGAN



bing

MAKLUMAT EMPANGAN

Tarikh/Maca	Stesen	Peras Air (m)	Takungan		Hujan (mm)
			Mm³	%	
20-05-2013 00:00 AM	Datu	103.76	0.00	100.00	0.00
NEW 06-06-2013 09:00 AM	Klang Gates	95.40	25.34	100.00	10.50
05-06-2013 07:00 AM	Kolam Takungan Sg. Labu (ORL)	44.50	10.00	98.08	0.00
NEW 06-06-2013 09:00 AM	Langat	221.06	34.10	100.00	28.10
NEW 06-06-2013 07:00 AM	Semenyih	111.00	59.37	100.00	13.10
NEW 06-06-2013 08:00 AM	Sg.Selangor	220.20	2.00	100.00	24.95
NEW 06-06-2013 08:00 AM	Sg.Tinggi	59.56	122.96	100.38	14.00
NEW 06-06-2013 09:00 AM	Tasik Subang	38.29	4.09	97.19	0.00

** Merujuk kepada data pada hari sebelumnya



Information System

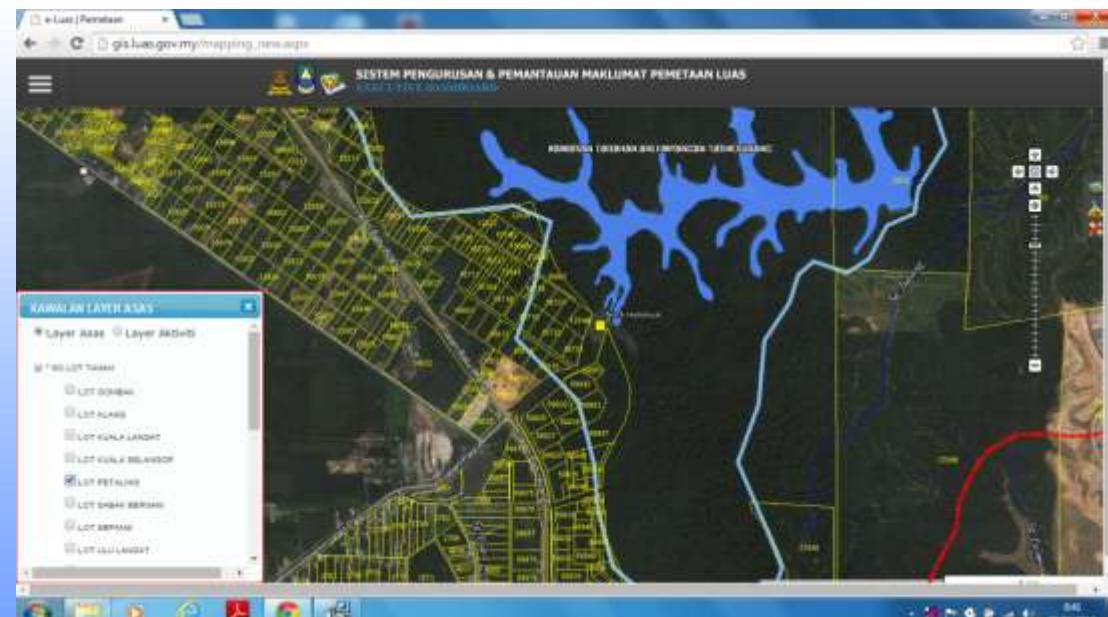
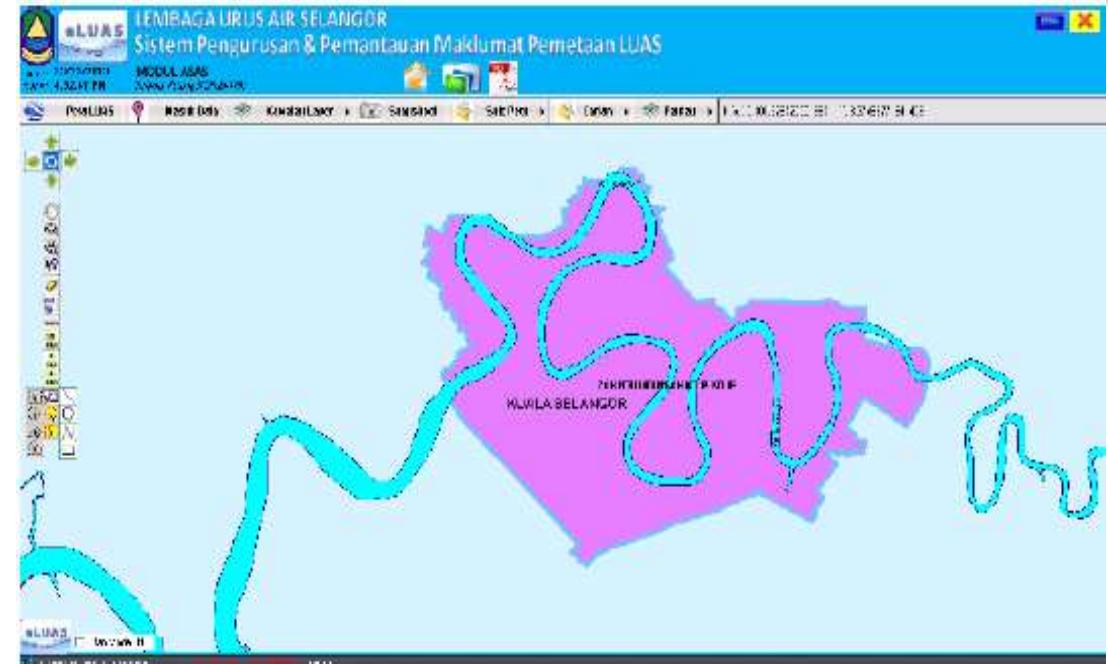
- **SPASA – SPASA** or Water Abstraction Licensing System was developed in order to help SWMA to manage the abstraction of water resources activities all over the state.
- This system consists of comprehensive information such as tube well operators, locations, volume of abstracted water, water quality and amount to be charged to the operators as well





Information System

- E-LUAS – The system consisting of 4 modules (**Basic module, resource alteration activities, pollutant control and water abstraction modules**) is in place to facilitate SWMA in order to manage the water resources of Selangor State. The system provides spatial information





UTILIZING & OPTIMIZING SURFACE RUN-OFF/POND THROUGH ALTERNATIVE WATER RESOURCES MANAGEMENT

- Alternative Water Resources Task Force was established to identify and monitor potential water resources to be developed as source of water supply.
- To develop storage pond as off-river storage and implement the rain water harvesting initiative.
- Gazettement of 17 ponds including ex-mining pond as Zone of Protection (s.48) for alternative water resources.



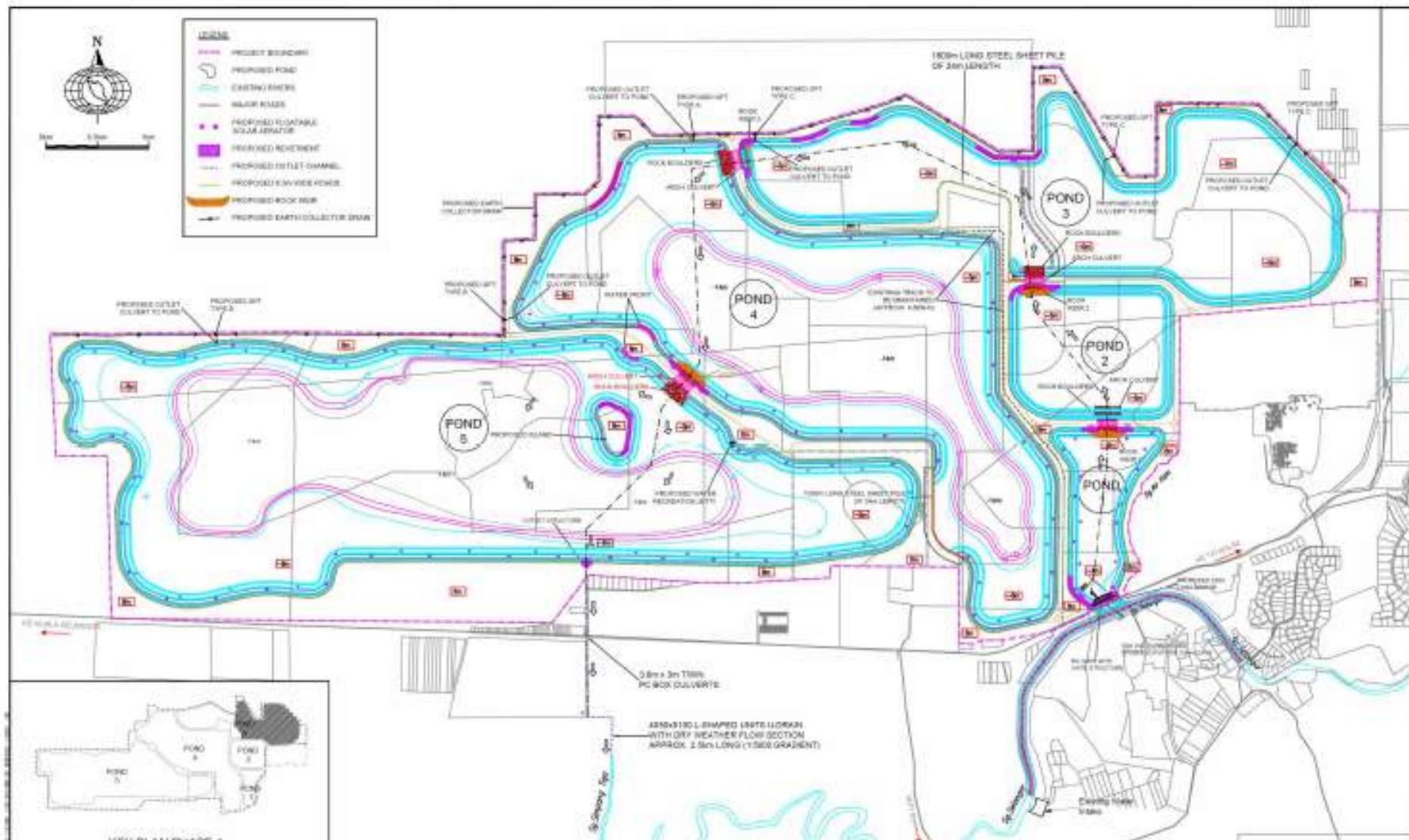
Alternative Water Resource Pond





LEMBAGA URUS AIR SELANGOR

LEM
SER



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

LAYOUT PLAN OF PROPOSED POND

 ZTE

LEMBAGA URUS AIR SELANGOR (LUAS)
Tanj. 12803, Segambut Road
No. 15, Jalan Iskandar, Segambut 11
60000 Kuala Lumpur, Malaysia

**REGISTRATION
NUMBER AND REFERENCE NUMBER**

Additional water source 2000 – 3000 mld

Figure 10.4: Propose Layout Phase 4

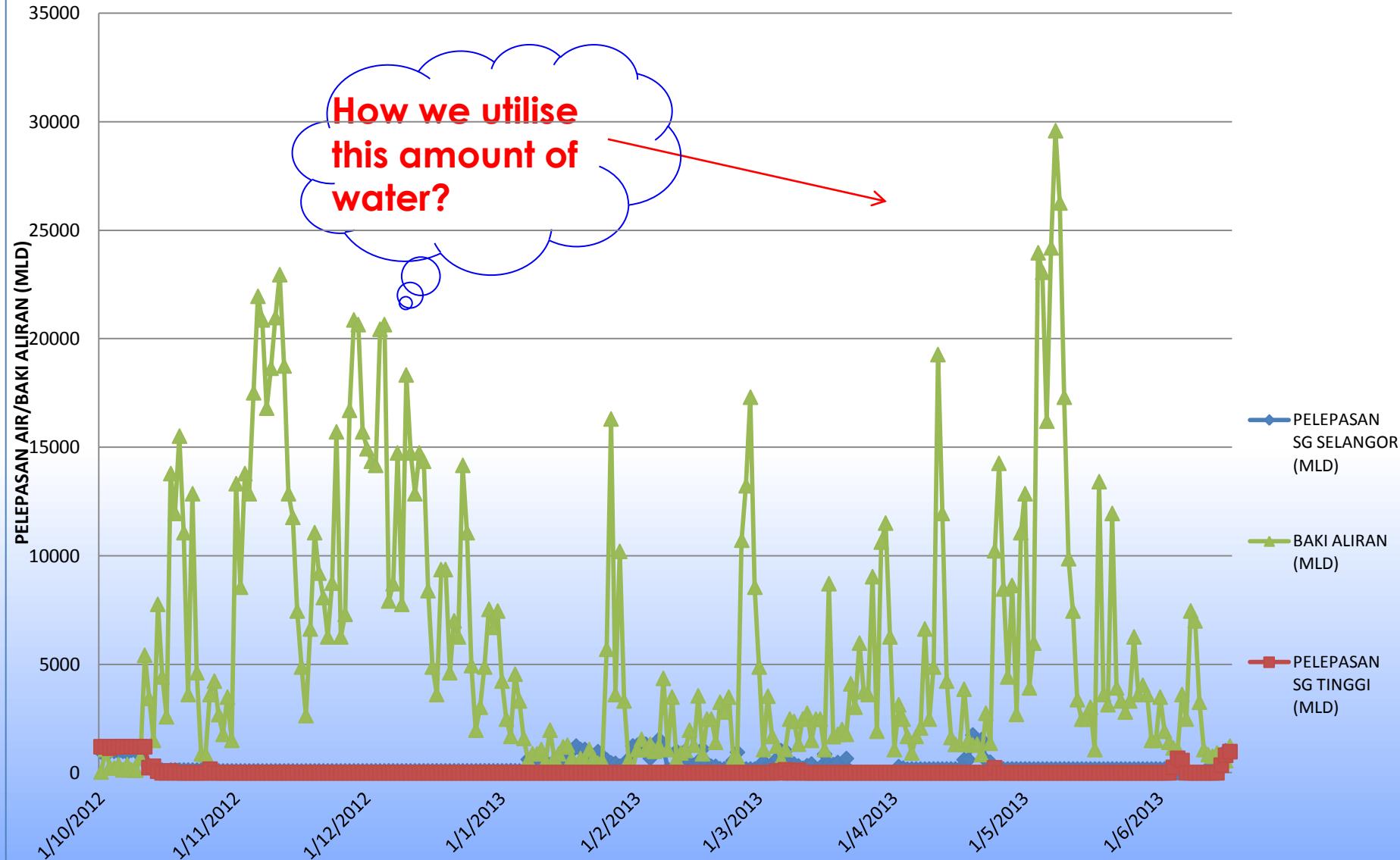
KEPUTUSAN ANALISA KOLAM OLEH JABATAN KIMIA MALAYSIA
PENSAMPELAN DIJALANKAN OLEH LUAS DAN JAB. KESIHATAN NEGERI SELANGOR PADA 20 MEI 2014

BIL	PARAMETER	UNIT	PIAWAIAN KKM	KOLAM HANG TUAH 2						
				STESEN 1 (Inlet)	STESEN 2 (Inlet)	STESEN 3 (Outlet)	STESEN 4 (Outlet)	STESEN 5 (Tengah_Permukaan)	STESEN 6 (Tengah_Separa)	STESEN 7 (Tengah_Dasar)
KUMPULAN 1 (PHYSICAL)										
1	Kekeruhan	NTU	1000	3.81	3.24	3.03	3.82	5.01	3.04	2.89
2	Total Coliform	MPN/100ml	5000	49	49	920	49	49	130	49
3	E. Coli	MPN/100ml	5000	17	33	540	23	33	79	13
4	pH		5.5 - 9.0	5.49	5.34	5.3	5.49	5.52	5.74	5.77
5	DO	mg/l						Tiada bacaan kerana kerosakan alat		
6	Suhu	C°	-	31.8	31.9	31.9	32	31.8	31.6	31.7
7	Warna	TCU	300	121.8	120.2	0	22	102.2	39.4	5.7
KUMPULAN 2 (METAL)										
8	Total Dissolved Solid	mg/l	1500	52	51	52	51	51	51	53
9	BOD	mg/l	6	<2	<2	<2	<2	<2	<2	<2
10	COD	mg/l	10	10	9	11	10	9	6	8
11	Chloride	mg/l	250	3	3	3	3	3	3	3
12	Keliatan		500	13	13	13	13	13	13	13
13	Iron / Ferum (Fe)	mg/l	1	0.12	0.13	0.15	0.15	0.12	0.13	0.12
14	Fluoride	mg/l	1.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
15	Aluminium (Al)	mg/l	*0.2	0.07	0.07	0.12	0.07	0.07	0.07	0.07
16	Manganese (Mn)	mg/l	0.2	0.06	0.06	0.06	0.06	0.06	0.06	0.06
KUMPULAN 3 (HEAVY METAL)										
17	Mercury (Hg)	mg/l	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
18	Cadmium (Cd)	mg/l	0.003	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
19	Selenium (Se)	mg/l	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
20	Arsenic (As)	mg/l	0.01	0.001	0.001	0.001	0.001	0.001	0.001	0.001
21	Lead / Plumbum (Pb)	mg/l	0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
22	Chromium (Cr)	mg/l	0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
23	Silver / Argentum (Ag)	mg/l	0.05	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
24	Copper / Cuprum (Cu)	mg/l	1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
25	Magnesium	mg/l	150	0.84	0.84	0.83	0.84	0.82	0.84	0.83
26	Sodium / Natrium (Na)	mg/l	200	1	1	1	1	1	1	1
27	Zinc (Zn)	mg/l	3	0.004	0.005	0.004	0.004	0.004	0.005	0.005
28	Sulphate (SO4)	mg/l	250	14	14	14	14	14	14	14
29	Nickel	mg/l	*0.02	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002

* mengikut Piawaian Mutu Air Minum Bagi Air Terawat



WATER RELEASES FROM SELANGOR AND TINGGI RIVER DAM COMPARED TO RESIDUAL FLOW AT BESTARI JAYA'S BARRAGE.



NOTE : Compulsory minimum residual flow of 300MLD



NATIONAL WATER RESOURCES STUDY REVIEW (2000-2050)

Available Rainfall in Malaysia (mm)

State	State Area (sq km)	Rainfall	Actual Evaporation	Groundwater Recharge	Surface Runoff
Perlis	821	1,880	1,290	120	470
Kedah	9,500	2,310	1,430	130	750
Pulau Pinang	1,048	2,350	1,430	120	800
Perak	21,035	2,420	1,320	170	930
Selangor	8,396	2,190	1,280	150	760
Negeri Sembilan	6,686	1,830	1,210	130	490
Melaka	1,664	1,880	1,210	100	570
Johor	19,210	2,470	1,130	200	1,140
Pahang	36,137	2,470	1,250	120	1,100
Terengganu	13,035	3,310	1,470	150	1,690
Kelantan	15,099	2,600	1,290	140	1,170
West Malaysia	132,631	2,490	1,280	148	1,060
Sabah	73,631	2,560	1,190	190	1,180
Sarawak	124,450	3,640	1,250	240	2,150
FT Labuan	91	3,100	1,480	150	1,470
East Malaysia	198,172	3,240	1,230	221	1,790
Malaysia	330,803	2,940	1,250	192	1,500



NATIONAL WATER RESOURCES STUDY REVIEW (2000-2050)

Table 1.2 - Water Demand for Various Sectors in Selangor

Sectors	2010	2020	2030	2040	2050	2010	2020	2030	2040	2050
	Water Demand MCM per year					Water Demand mm rainfall per year				
Potable Water Demand	1,474	1,787	1,960	2,181	2,364	175.5	212.8	233.5	259.8	281.6
Irrigated Paddy	720	655	555	516	482	85.8	78.0	66.1	61.5	57.4
Non-Paddy Crops	36.0	37.0	39.0	43.0	48.0	4.3	4.4	4.6	5.1	5.7
Livestock	8.6	11.3	14.9	20.2	27.9	1.0	1.3	1.8	2.4	3.3
<i>Total consumptive demand</i>	2,238	2,490	2,569	2,760	2,922	266.6	296.6	306.0	328.7	348.0
Fisheries	159.2	194.1	236.6	288.4	351.5	19.0	23.1	28.2	34.3	41.9
Total demand	2,397	2,684	2,806	3,048	3,274	285.5	319.7	334.2	363.1	389.9



State	Land Area Sq km	Total Consumptive Water Demand (mm)					Effective Rain (mm)	Excess/Deficit (mm)-Unregulated Flows				
		2010	2020	2030	2040	2050		2010	2020	2030	2040	2050
Perlis	821	372.3	364.2	348.0	345.5	342.3	71	(302)	(294)	(277)	(277)	(272)
Kedah	9,500	307.6	313.2	299.1	302.4	302.8	113	(195)	(201)	(187)	(190)	(190)
Pulau Pinang	1,048	729.4	791.3	797.5	834.4	853.2	120	(609)	(671)	(677)	(714)	(733)
Perak	21,035	92.7	91.6	85.5	85.6	86.1	140	47	48	54	54	53
Selangor	8,396	266.6	296.6	306.0	328.7	348.0	114	(153)	(183)	(192)	(215)	(234)
Negeri Sembilan	6,686	51.0	54.1	53.6	54.7	56.0	74	23	19	20	19	18
Melaka	1,664	193.9	220.1	225.9	246.0	263.4	86	(108)	(135)	(140)	(161)	(178)
Johor	19,210	37.2	45.8	53.8	60.6	67.7	171	134	125	117	110	103
Pahang	36,137	20.1	26.2	24.8	25.2	26.5	165	145	139	140	140	138
Terengganu	13,035	67.8	74.8	74.4	76.7	78.7	254					
Kelantan	15,099	108.1	107.2	105.0	106.0	106.2	176					
Pen Malaysia	132,631	96.5	103.1	102.2	105.9	109.2	159	62	56	57	53	50
Sabah	73,631	12.4	18.4	18.9	19.6	20.0	177	165	159	158	157	157
FT Labuan	91	197.7	264.3	40% surface runoff utilisation					50% surface runoff utilisation			
Sarawak	124,450	8.4	17.3									
East Malaysia	198,172	10.0	17.9	17.9	18.4	18.9	269	258	251	251	250	250
Total Malaysia	330803	44.7	52.0	51.7	53.5	55.1	225.0	180.3	173.0	173.3	171.5	169.9

Effective rain in Selangor,
14% from 760 mm.

40% surface runoff
utilisation

50% surface runoff
utilisation



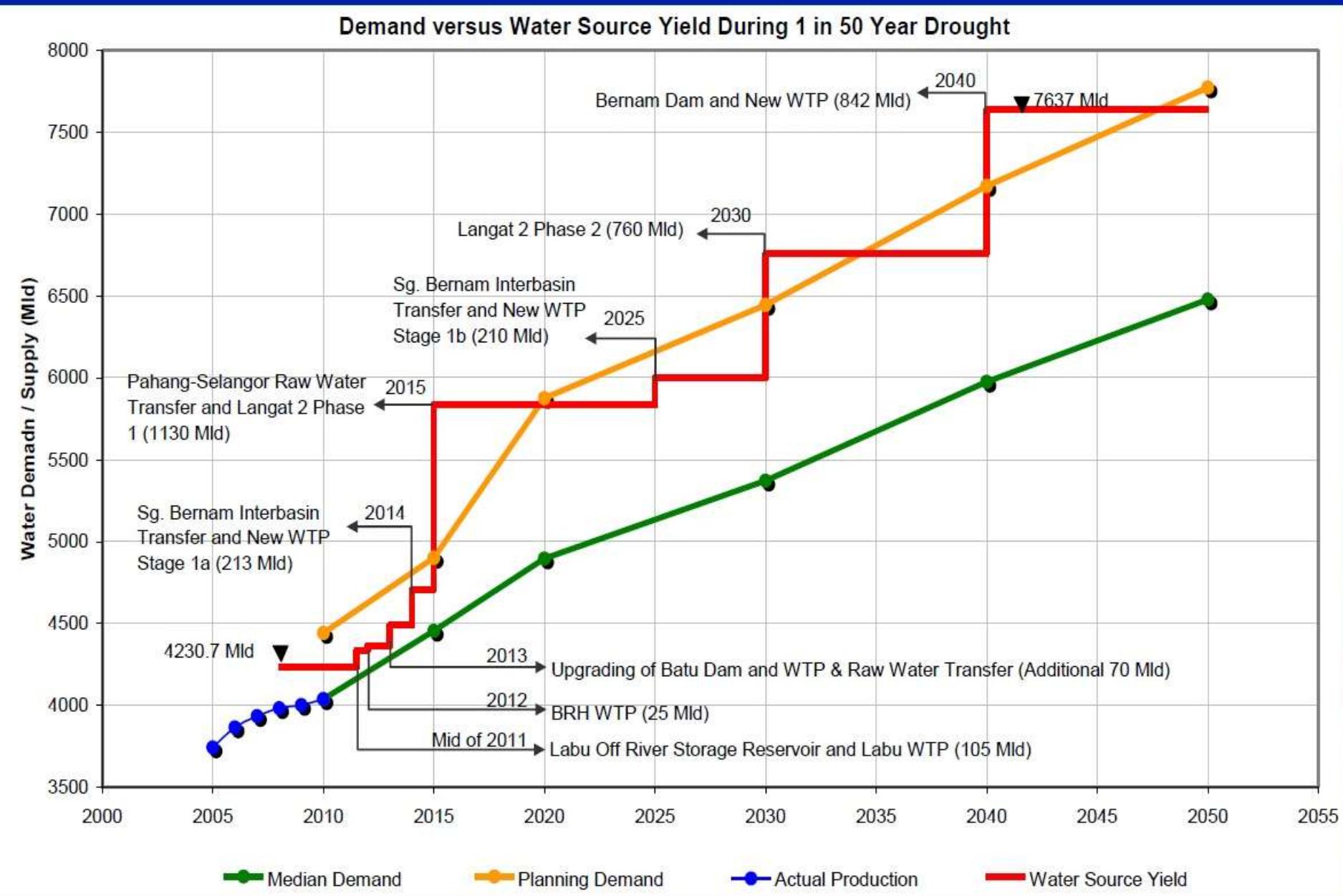
NATIONAL WATER RESOURCES STUDY REVIEW (2000-2050)

Available Water Resource

- Annual rainfall - 2,190mm
- Surface runoff - 760 mm

Equivalent to 6.38 billion cubic yearly or 17,000MLD
(take consideration of evaporation and ground
water recharge)

- Water demand all sector 2010 - 6132 MLD
- Environmental flow – 1700MLD
- 9168 MLD to be utilised





YEARLY CAUTIONARY CLOUD SEEDING INITIATIVE

- Early dry spell experienced since January 2014.
- Unusual trend against yearly recorded rainfall pattern (weather change).
- Significant decrease of dam's water capacity.
- Cloud seeding operation initiated with the co-operation of Met Malaysia, TUDM and the appointed company.
- Hygroscopic flare technique was used, but however the expected results were not significant.
- Received the co-operation from the Royal Rainmaking and Agricultural Aviation Department of Thailand on enhancing the effectiveness of the operation.



...CONT

- In the process of acquiring permissions to transfer and adopt Thailand's technology and technique on the operation.
- Thailand's "Sandwich Technique" utilizes variety of substances including dry ice, sodium chloride, calcium chloride and few others at different altitude.
- Cloud seeding operation is planned to be executed yearly as one of the cautionary action following procedure.
- To prevent reoccurrence of dam's capacity significant decrease in the future.
- To increase river flow thus reduce dependency on dam's water release.



LEMBAGA URUS AIR SELANGOR

LUAS

LEMBAGA URUS AIR
SELANGOR (LUAS)



During cloud seeding operation with Captain Chititewan of Royal Rainmaking and Agricultural Aviation of Thailand



RIVER MANAGEMENT POLICY

- To ensure the natural physical condition of the river is conserved to maintain the river's geomorphology.
- To conserve ecological and environmental value for aquatic life.
- To conserve and adopt the aesthetic value of the river in any development projects through preservation of the existing natural river.
- To ensure sufficient water quantity and quality clean water for water supply.
- To implement the Best Management Practices (BMPs) in any development projects to sustain the natural river such as through the MSMA.

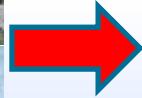
Note: Parallel to s43(1), SWMA Enactment 1999 for 'alteration activities'.



Natural river



Channelized river due to development



Paradigm Shift

**Implementation
of concept;
“Development
Based on River
Physical”**



EFFECT

- Increased flow velocity
- Increased erosion and sedimentation
- Flood risk

Diversion of Rawang River due to commercial development

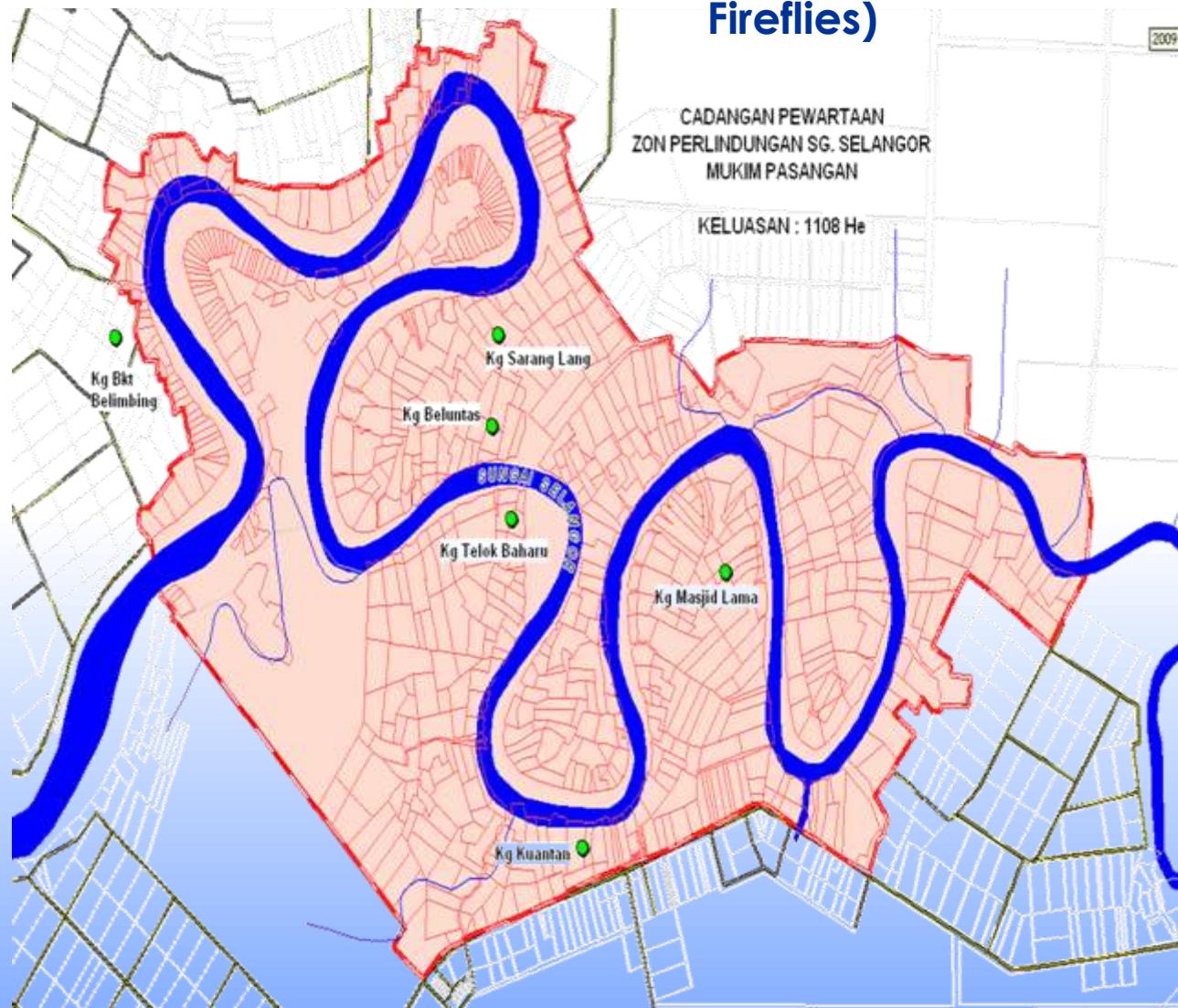


ZONE OF PROTECTION GAZETTEMENT

- **Zone of Protection (Declared Area and Restriction) Notification, No. 2 2010 – (7 dams of water catchment).**
- **Zone of Protection (Declared Area and Restriction) Notification, 2009 – (Fireflies, Mukim Pasangan).**
- **Zone of Protection (Declared Area and Restriction) Notification, 2010 (Environmental sensitive area, Mukim Kapar).**
- **Selangor River Basin Management Plan (2007-2012).**
- **Klang Port Strategy Implementation Plan.**



ZONE OF PROTECTION (DECLARED AREA AND RESTRICTION) PLAN JULAI 2009 (POLICY 4, Selangor River IRBM Plan : Conservation of Fireflies)



PETUNJUK :

- Zon Perlindungan
- Sungai
- Kampung
- Lot Tanah

PW1539



CONCLUSION

- SWMA functions & objectives remain as stated in the Enactment.
- Aggressive monitoring and enforcement through available tools.
- Effort on fully utilizing other available water resources.
- Management of water resource in integrated manner





NARBO -River Basin Benchmarking Accessment 2013 dan Target 2018





WAY FORWARD

Water resources as drivers of the state economy in various sectors



WAY FORWARD : RESTORE & TRANSFORM



**DECLINING QUALITY OF WATER RESOURCES
(RIVER BASINS & COASTAL AREA)**





THANK YOU

“Water for All”

