Wastewater **M**anagement **Ex**pert system

"WaMEx"

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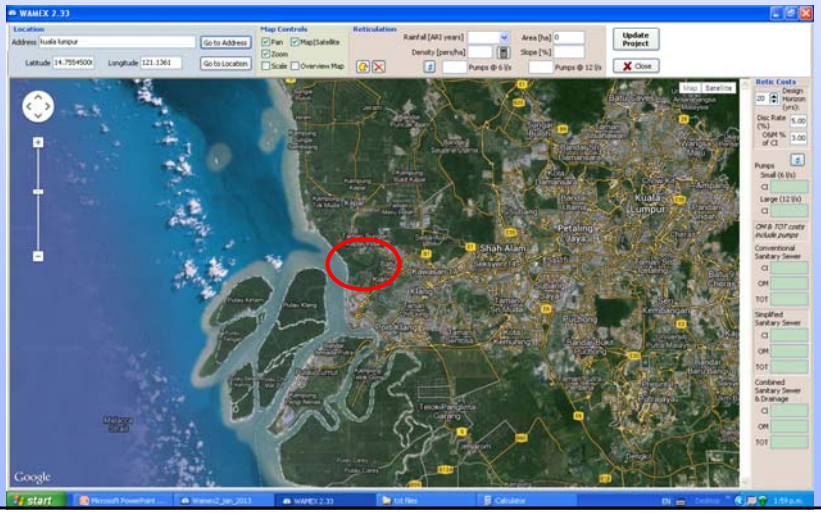
CASE STUDY WORK: Kuala Lumpur, Malaysia

CASE STUDY 1: Wastewater Technology Selection Module

Government is planning to develop a new urban area in Malaysia (KL): 213 Hectares **Population**: 10,000



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CASE STUDY 1: Wastewater Technology Selection Module

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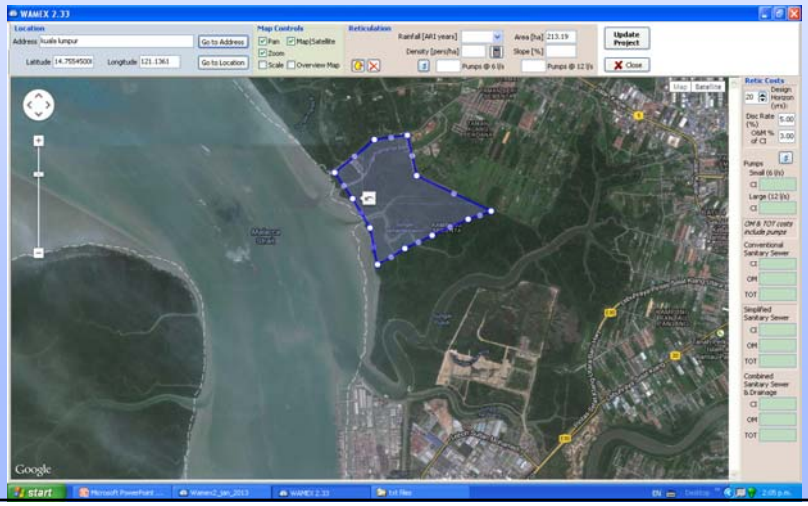

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CASE STUDY 1: Wastewater Technology Selection Module

Step 1: set up a new project!

Urban area in Malaysia (KL): 213 Hectares

Population: 10,000

Design Horizon: 20 years;
O&M as % of CI: 3%;
Discount Rate: 5%

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CASE STUDY 1: Wastewater Technology Selection Module

Step 2: define WW characteristics!

Wastewater source/characterisation options considered:
Sanitary Sewerage 100 l/p/d, 550, 100, 60, 5, 200

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CASE STUDY 1: Wastewater Technology Selection Module

Step 3: evaluate technology options!

Factors for consideration of technology options:
1: Efficiency (Coliform Removal, Sludge Generation),
2: Shock Resistance (Flow, Toxicity),
3: Economy (Energy);

Try different combinations of weights in order to check "sensitivity" of technologies;

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CASE STUDY 1: Wastewater Technology Selection Module

Step 4: Evaluate new scenario!

Government may adopt Singaporean Stds in the future
Design Horizon: 20 years;
O&M as % of CI: 3%;
Discount Rate: 5%

Factors for consideration of technology options:
1: Efficiency (Coliform Removal, Sludge Generation),
2: Shock Resistance (Flow, Toxicity),
3: Economy (Energy);

Try different combinations of weights in order to check "sensitivity" of technologies;

6

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CASE STUDY 1: Wastewater Technology Selection Module

Step 5: Analyse results!

Compare the results from both options

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CASE STUDY 1: Wastewater Technology Selection Module

Step 6: Answer the question below!

Which technology options would you recommend?

Discuss the results within the group

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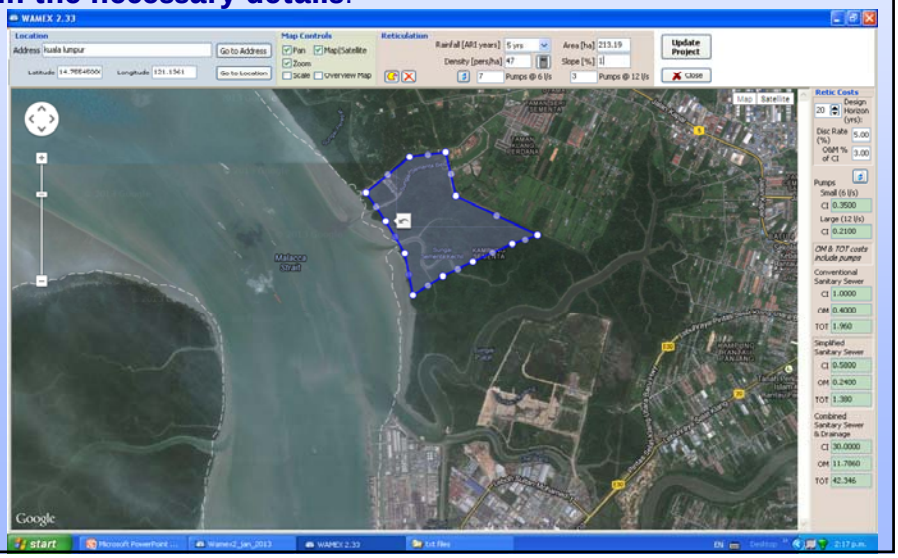
CASE STUDY 1: Reticulation Selection Module

Step 7

Fill in the necessary details:



CASE STUDY 1: Reticulation Selection Module

Step 7

Fill in the necessary details:

Terrain slope: 1%
Design Horizon: 50 years;
O&M as % of CI: 2%;
Discount Rate: 5%

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CASE STUDY 1: Reticulation Selection Module

Step 8

Calculate costs of three sewer options (costs are in USD Million):

- Conventional sanitary sewer
- Simplified sanitary sewer
- Combined Sanitary Sewer and Drainage

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CASE STUDY 1: Both Modules

Step 9

Add up all costs (i.e., treatment + reticulation) and discuss the findings within your group and present the conclusions!

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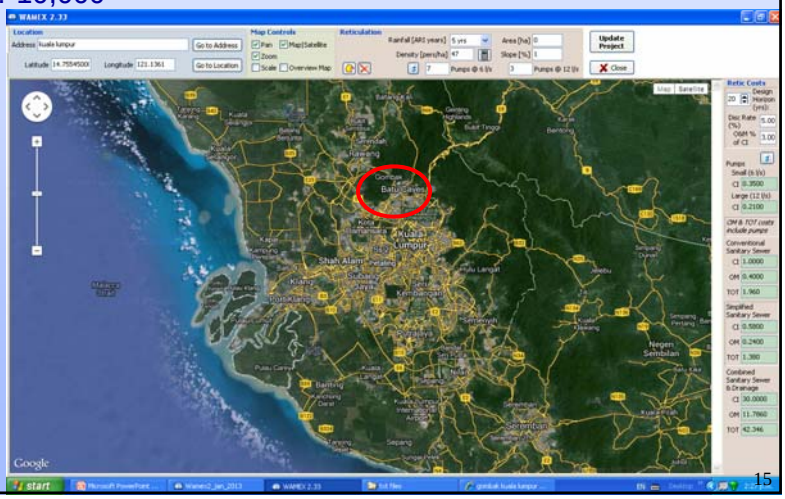
CASE STUDY 2: Wastewater Technology Selection Module

Government is planning to upgrade the WW system in the existing Batu Caves area in Malaysia (KL): 75 Hectares
Population: 10,000



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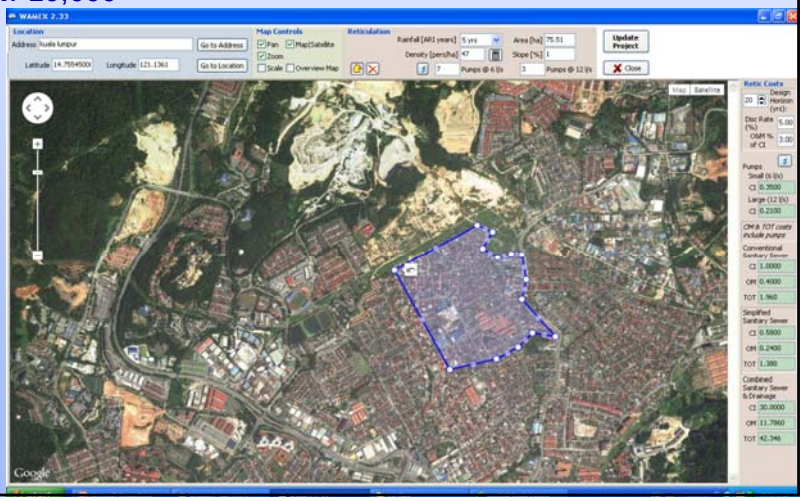
CASE STUDY 2: Wastewater Technology Selection Module

Government is planning to upgrade the WW system in the existing Batu Caves area in Malaysia (KL): 75 Hectares
Population: 10,000



CASE STUDY 2: Wastewater Technology Selection Module

Step 1: set up a new project!

Urban area in Malaysia (KL): 75 Hectares

Population: 10,000

Design Horizon: 20 years;
O&M as % of CI: 3%;
Discount Rate: 5%

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CASE STUDY 2: Wastewater Technology Selection Module

Step 2: define WW characteristics!

Wastewater source/characterisation options considered:
Group a) Sanitary Sewerage 100 l/p/d, 550, 100, 60, 5, 200
Group b) Black Water 150 l/p/d, 200, 100, 200, 5, 0
Group c) Combined Sewage 200 l/p/d, 400, 200, 20, 2, 30

20, 35, 33

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CASE STUDY 2: Wastewater Technology Selection Module

Step 3: evaluate technology options!

Factors for consideration of technology options:
1: Efficiency (Coliform Removal, Sludge Generation),
2: Shock Resistance (Flow, Toxicity),
3: Economy (Energy);

Try different combinations of weights in order to check "sensitivity" of technologies;

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CASE STUDY 2: Wastewater Technology Selection Module

Step 4: Evaluate new scenario!

Government may adopt Singaporean Stds in the future
Design Horizon: 20 years;
O&M as % of CI: 3%;
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Factors for consideration of technology options:
1: Efficiency (Coliform Removal, Sludge Generation),
2: Shock Resistance (Flow, Toxicity),
3: Economy (Energy);

Try different combinations of weights in order to check "sensitivity" of technologies;

6, 8, 13

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CASE STUDY 2: Wastewater Technology Selection Module

Step 5

Set up a new standard – assume values between Malaysian and Singaporean standards (database entry)

Evaluate technology options for the new standard

Discuss the results

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CASE STUDY 2: Wastewater Technology Selection Module

Step 6: Analyse results!

Compare the results from all three options

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CASE STUDY 2: Wastewater Technology Selection Module

Step 7: Answer the question below!

Which technology options would you recommend?

Discuss the results within the group

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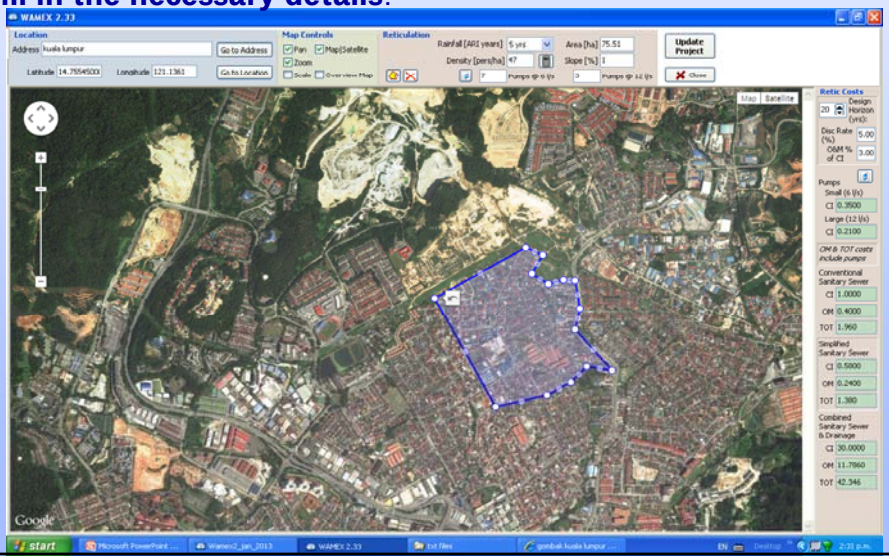
CASE STUDY 2: Reticulation Selection Module

Step 7

Fill in the necessary details:



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CASE STUDY 2: Reticulation Selection Module

Step 7

Fill in the necessary details:

Terrain slope: 1%
Design Horizon: 50 years;
O&M as % of CI: 2%;
Discount Rate: 5%

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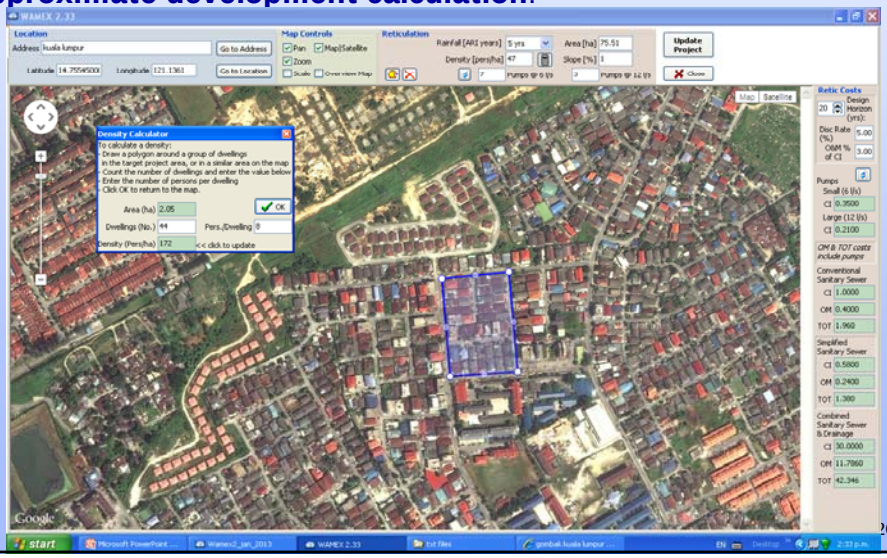
CASE STUDY 2: Reticulation Selection Module

Step 8: Measurements

Approximate development calculation:



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CASE STUDY 2: Reticulation Selection Module

Step 9

Calculate costs of three sewer options (costs are in USD Million):

- Conventional sanitary sewer
- Simplified sanitary sewer
- Combined Sanitary Sewer and Drainage

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CASE STUDY 2: Both Modules

Step 10

Add up all costs (i.e., treatment + reticulation) and discuss the findings within your group and present the conclusions!

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Thank you for your attention!

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