



*Integrated Planning and Partnership Model
for Brownfield Regeneration*

Baltic Urban Lab Webinar 3

Soil contamination in brownfields – How does it affect planning?

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City of Norrköping





*Soil contamination in Brownfields
-how does it affect planning?*

Issues

- Health and safety
- Environment and spreading of contamination to surrounding areas
- Time and economy



Layout of the webinar

Part one: Managing the remediation process

- Why is there a problem with contaminated land?
- Preparations to remediation
- Executing remediations
- Post remediation

Part two: Remediating the Inner Harbour of Norrköping

- Preparations
- Remediation methods chosen
- Work to be done
- Costs and time
- Problems and lessons learned

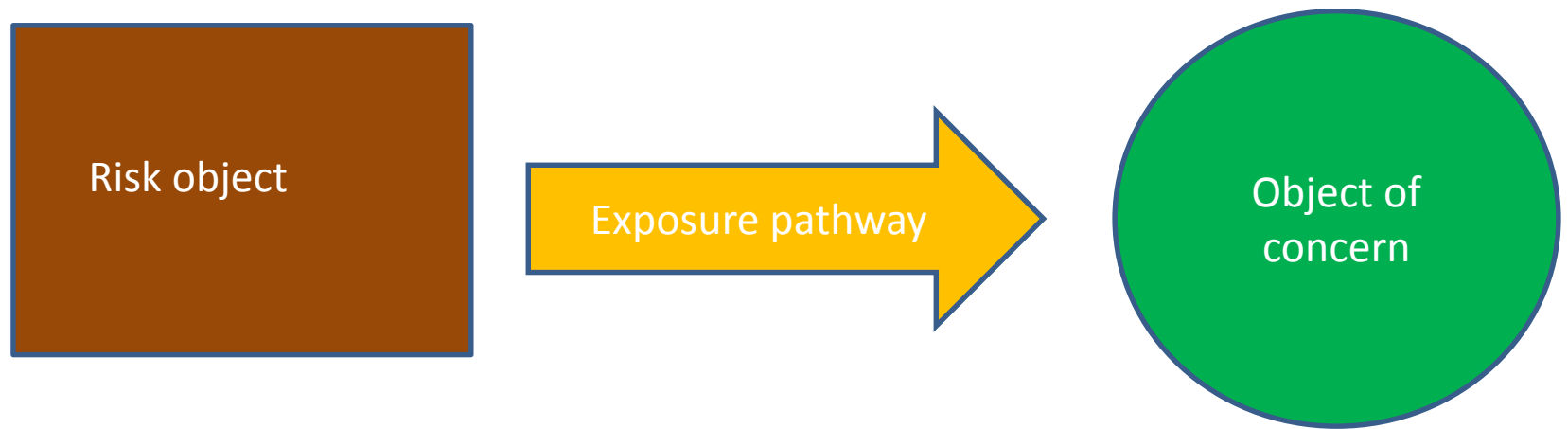




Why is soil contamination a problem when planning Brown Fields?

- Is there a risk with the current situation at the site?
- Future use of the land – new risks?



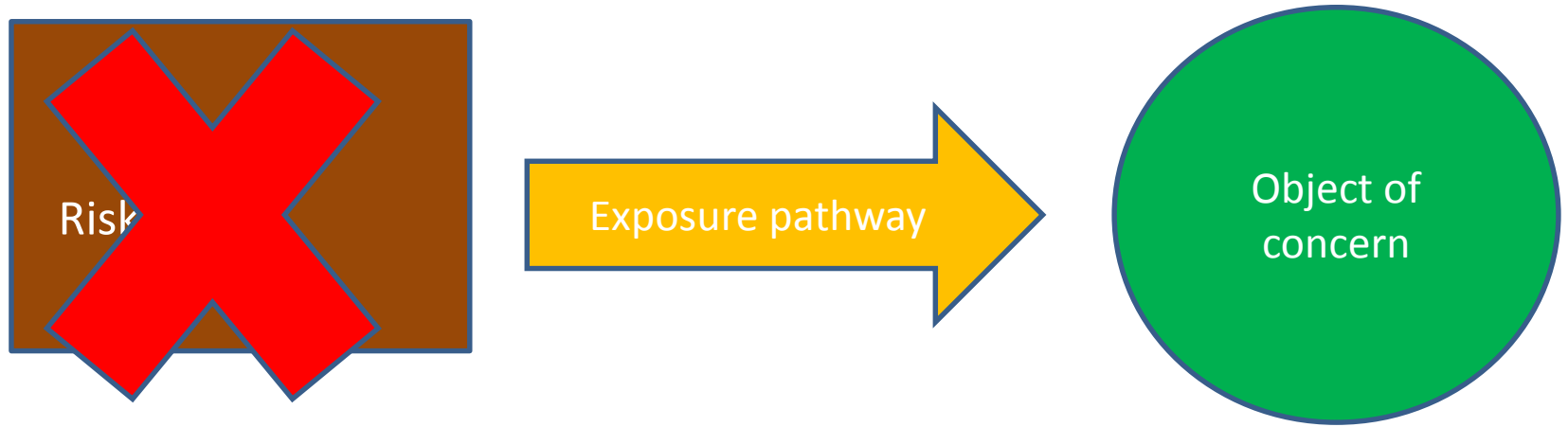


Risk assessment

Risk object :contaminated soil, water, sediment, building etc

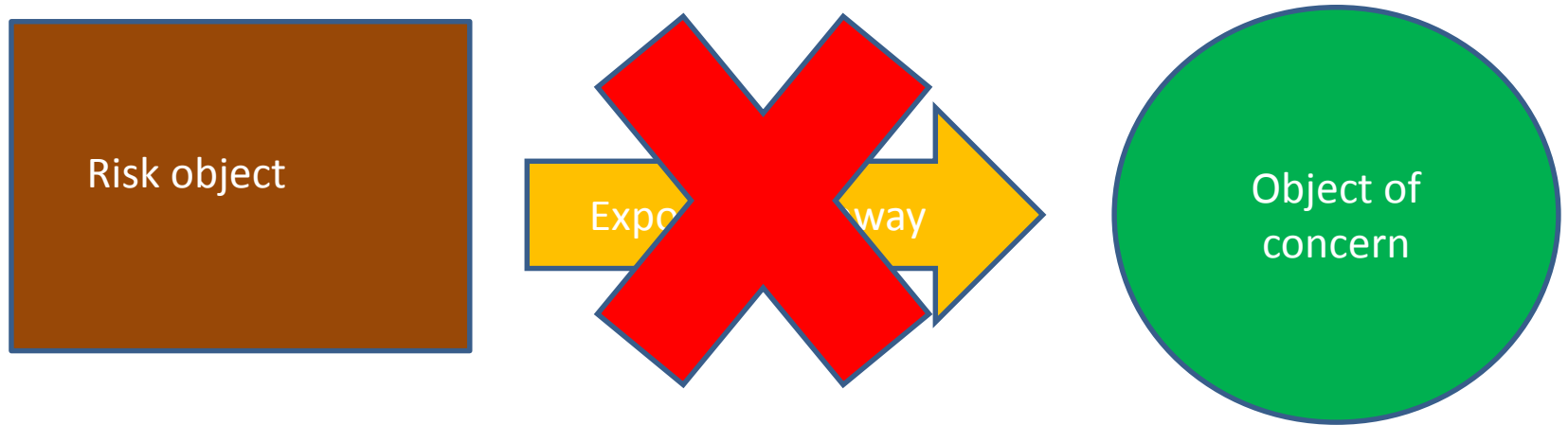
Path way : ingestion, inhalation, dermal contact of contaminated soil or water etc

Object of concern, Human; Adults and children,, animals, vegetation, surface waters, groundwaters, etc



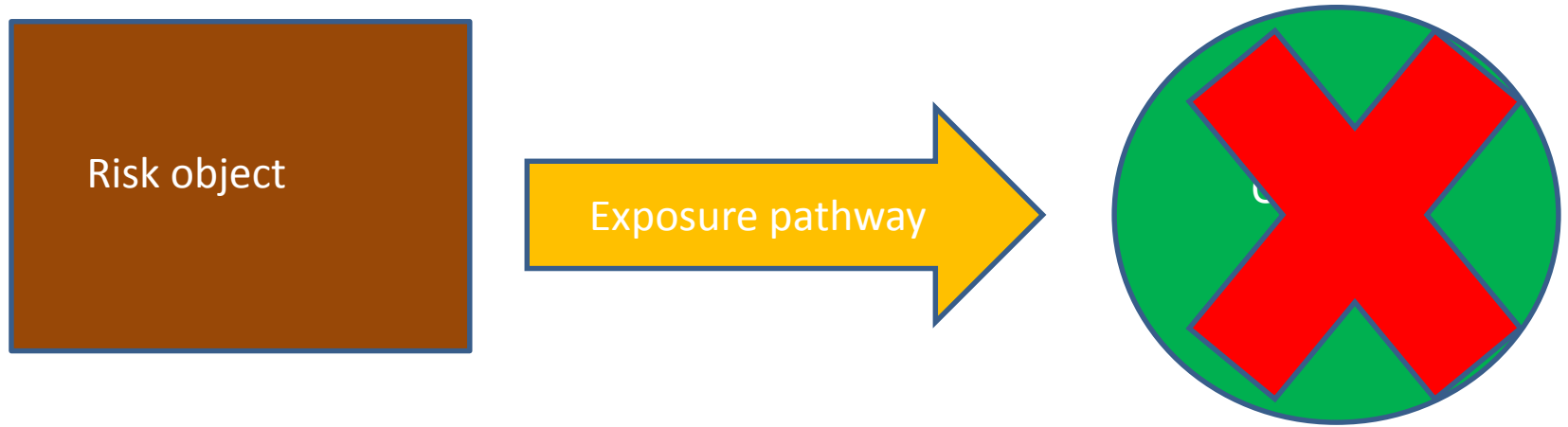
Risk assessment

No risk object? = No risk



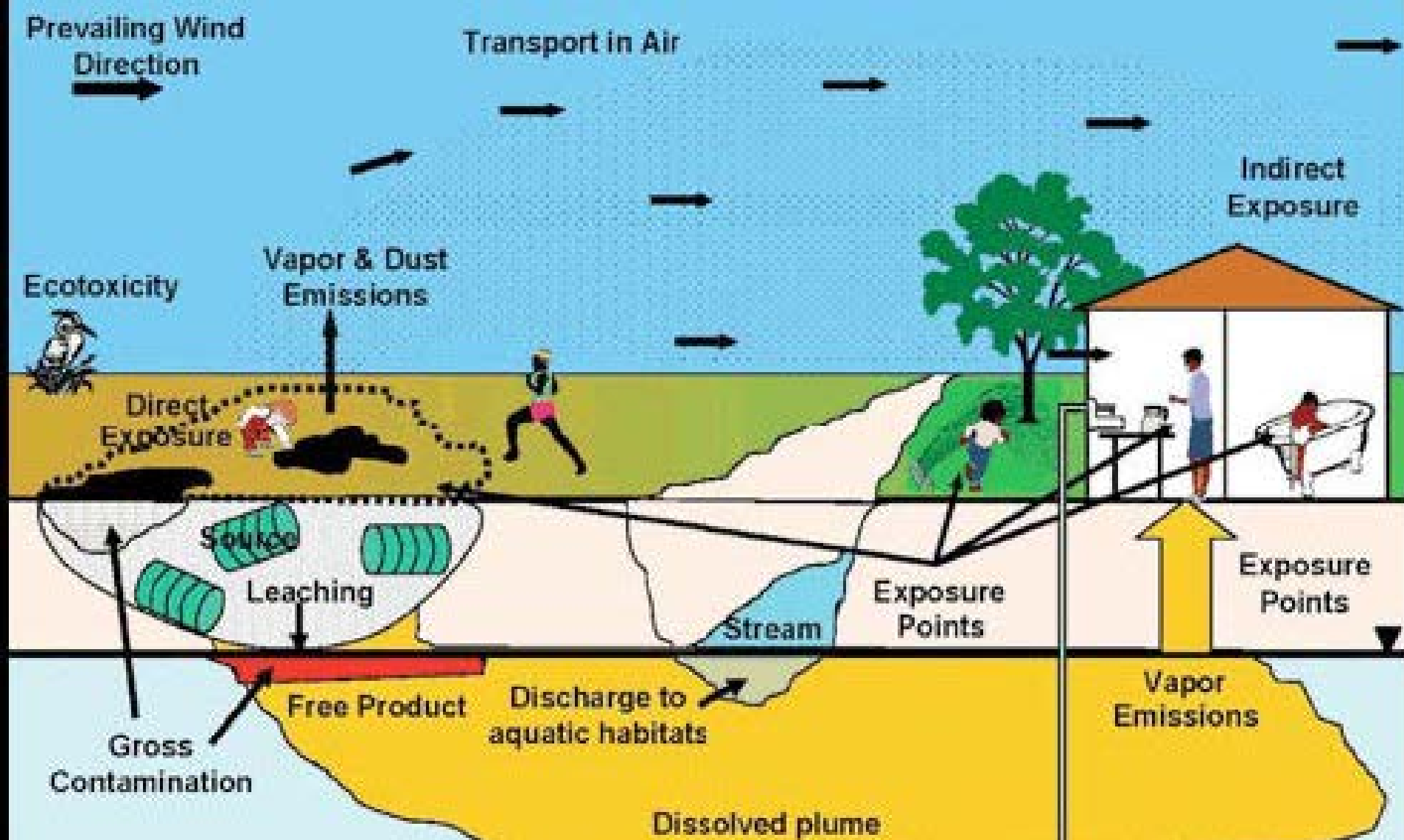
Risk assessment

No pathway = No risk



Risk assessment

No object of concern = No risk



Risk assessment -> Conceptual Model

Risk assessment should start with a conceptual model



Part one: Managing the remediation process

Preparations

- Surveys of contamination
- Assessing risks
- Choosing remediation method
- Risk evaluation of remediation alternatives



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Johannesborg

Kompletterande undersökningar
Maj-juni 2012

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ORT: Linköping
DATUM: 2012-06-13

0 5 10 20 Meter

Arsenik, mg/kg

- < 10
- 10 - 25
- 25 - 40
- 40 - 100
- 100 - 500
- > 500

Delområden

Vectura



Part one: Managing the remediation process

Remediation Goals

- Measurable Remediation Goals
- Authorities and other stakeholder confident with the goals
- If You are using guideline values – how are You measuring them





Part one: Managing the remediation process

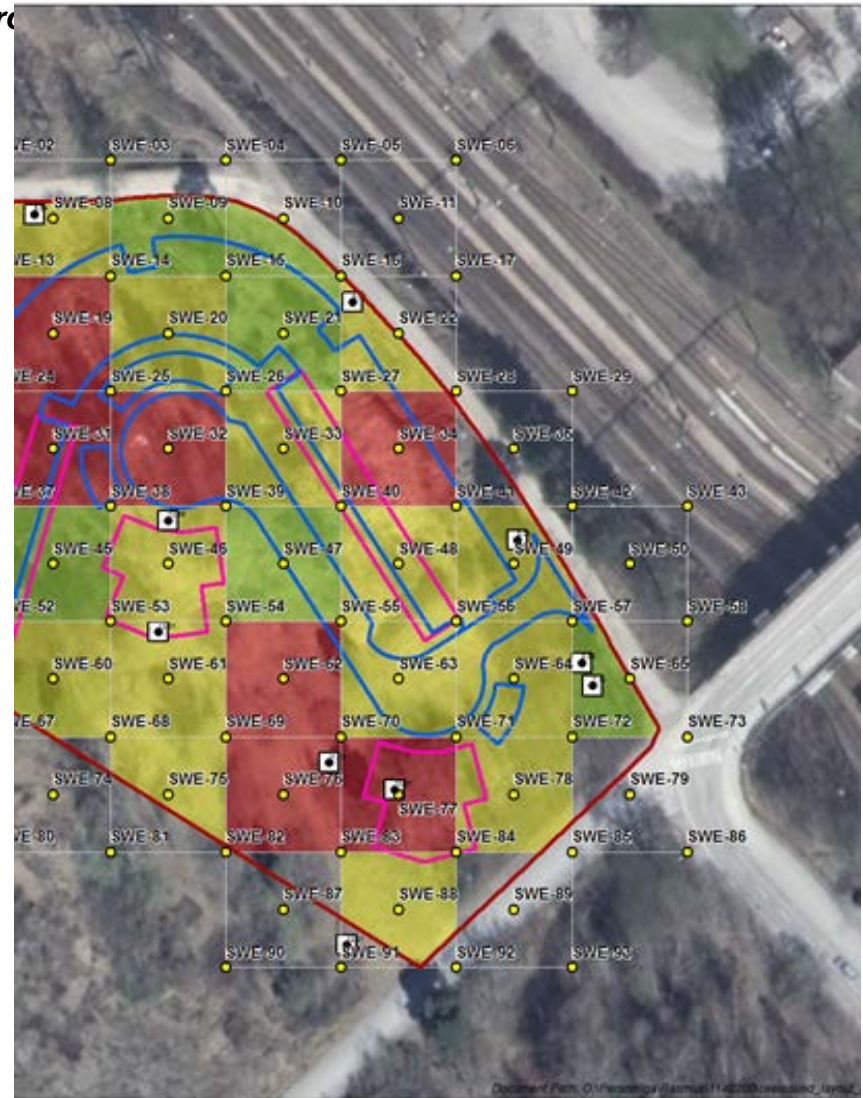
Preparations -permits

- Remediation Permit?
- Permit to lower groundwater?
- Culture heritage – permits?
- Restrictions of preservation nature?
- Permit to demolate buildings?
- Permit to demolish concrete?
- Protect vegetation such as special trees from damage



Preparations

- Health and Safety and Environment plan (HSE)
- If excavation – excavation plan
- Risk analysis: Identify risks such as interference and time dependent tasks



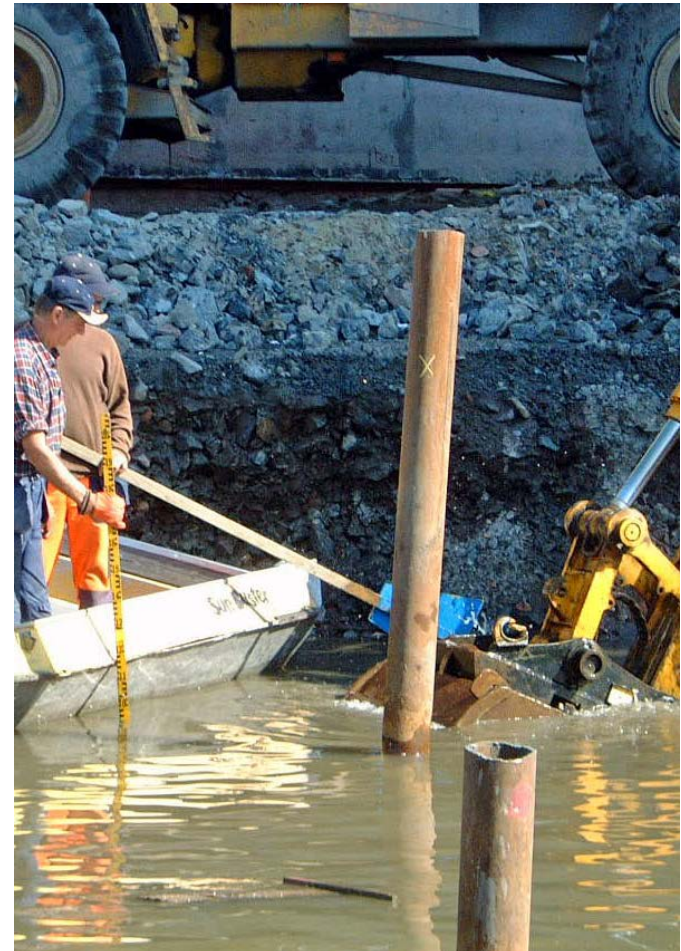


Part one: Managing the remediation process

Technical Preparations and tendering

- Demolition of buildings?
- Handle concrete and asphalt, old asphalt with tar?
- Do you have to pump out groundwater?
- Contaminated water must be cleaned
- Risk of landslides?
- Logistics
- Dust control
- Noise control

There are a lot of questions that have to be solved when tendering - not just digging out the contaminated soil.





Part one: Managing the remediation process

Tendering

- Contractor to remediate the soil
- Contaminated soil treatment facility
- Contractor to demolate buildings
- Laboratory
- Transports
- Concrete crushing etc
- Backfillings

Make sure to set interfaces to other contract works at the working area





Part one: Managing the remediation process

Communication

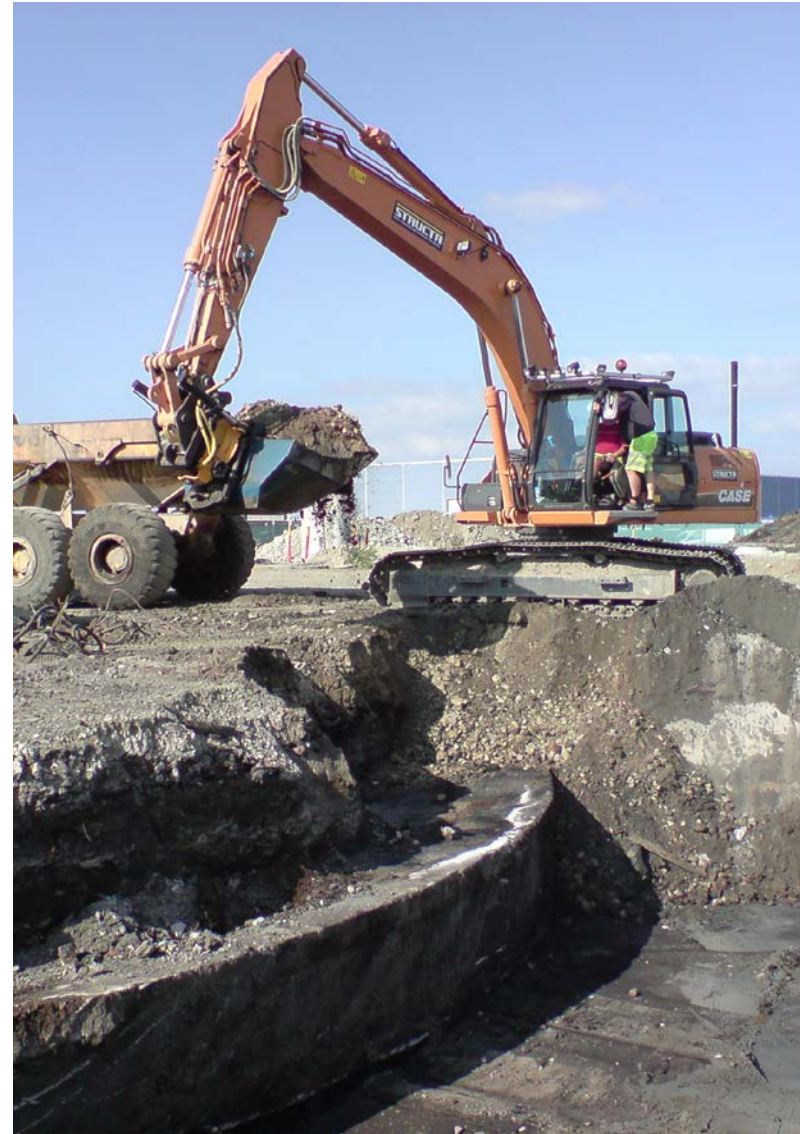
- Stakeholders
- Authorities
- Public





Implementation of the remediation

- Coordination of different contracts, archeologist, environmental control
- Health and safety follow-up
- Watercleaning – follow up on cleaning results
- Environmental control – surface waters, groundwater, air,
- Control of remediation results – are the remediation goals met?
- Do not forget to communicate through the implementation of the remediation





Finish remedaition

- Be sure to document the remediation actions taken.
- Record the reduction of contaminants
- Document the contamination that could not be reduced and do a risk assessment on remaining contamination if any.

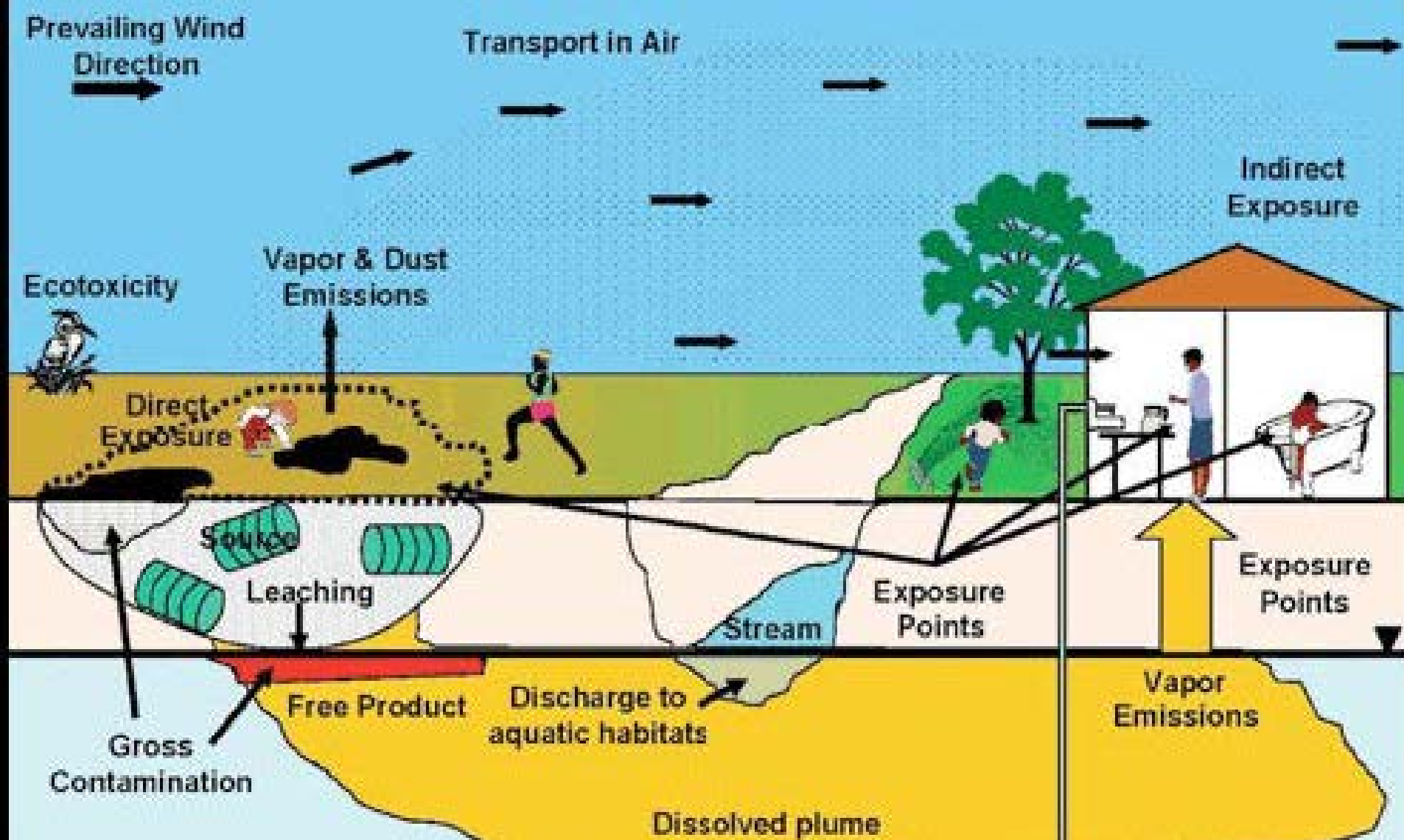


The Gaswork site today



Gas work site tomorrow ?!

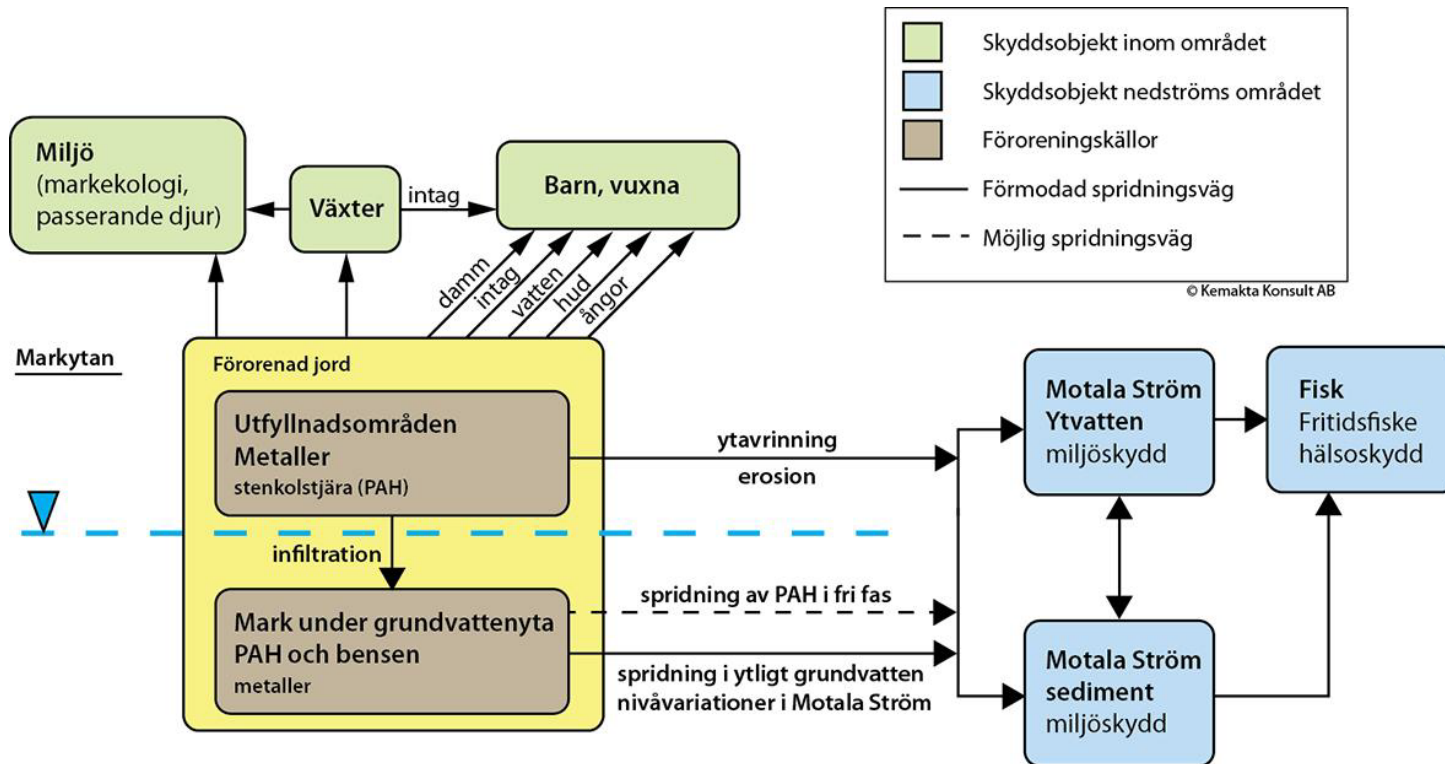


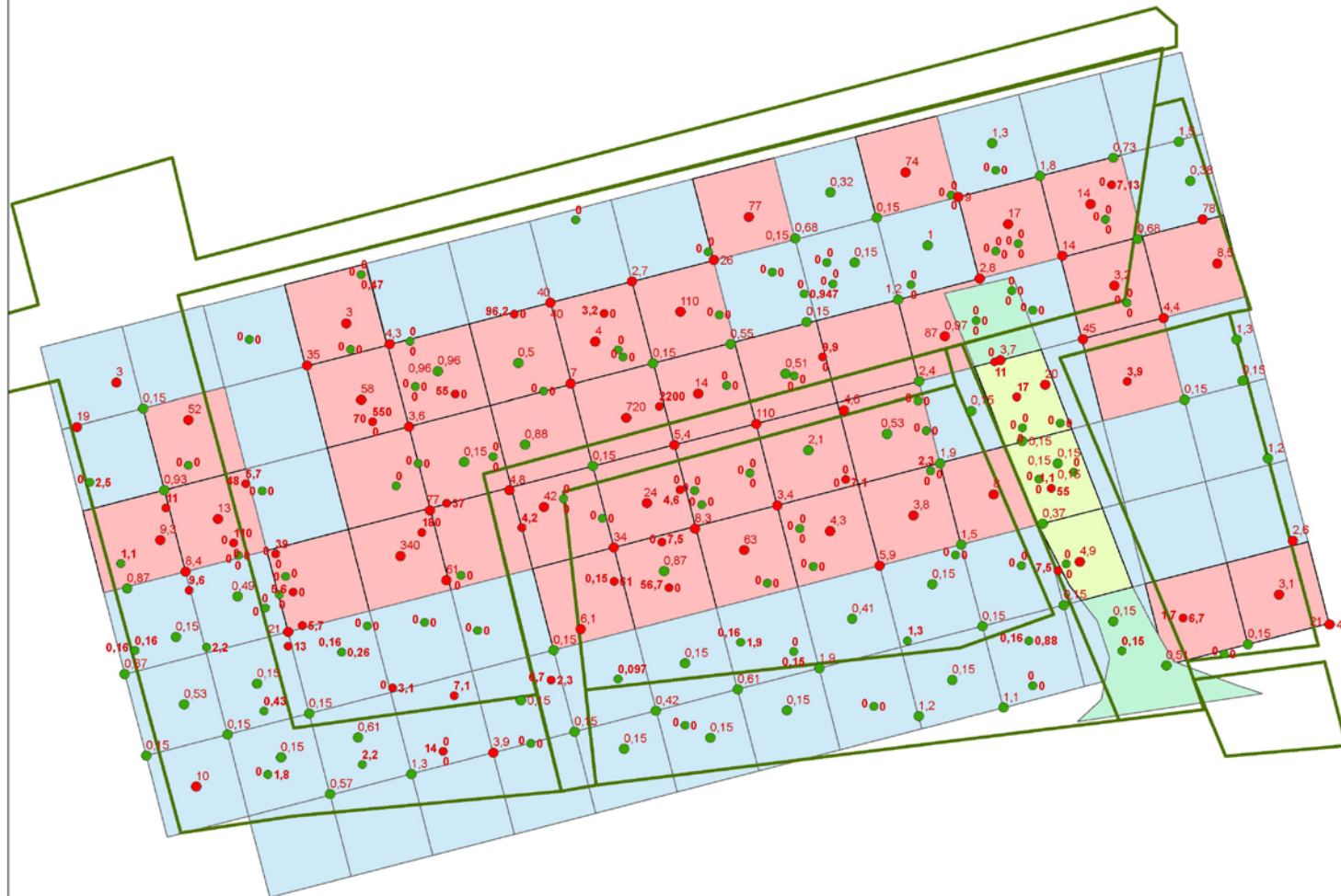


Conceptual Model

Risk assessment should start with a conceptual model

Conceptual model of risk Inner harbour





Nivå 0-0,5 m u my

TECKENFÖRKLARING

Resultat_0-05

PAH_H

- 0,150000 - 2,500000
- 2,500001 - 720,000000

Dockan: 3 rutor = 600 m3

Gasverket: 40 rutor = 8 000 m3



Växel: 08-695 60 00

UPPDRAGSANSVARIG YVONNE STIGLUND	KONSTR SEAAPN
ORT NORRKÖPING	DATUM 2016-03-22
SKALA 1:1 000	FORMAT A3
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Investigations and a excavating Plan



Part two: 2 Remediation of the Inner harbour

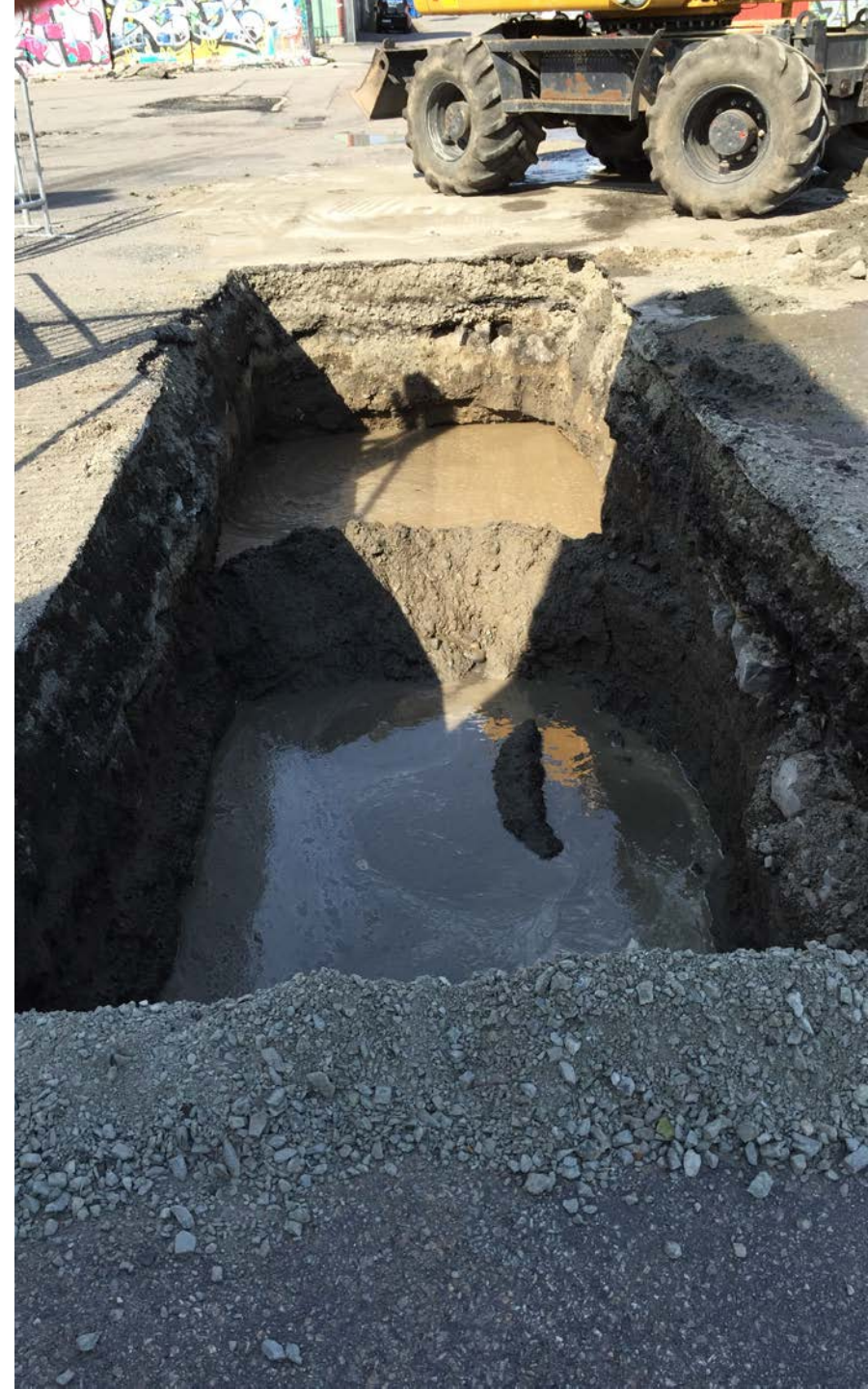
Preparations -permits

- Remediation Permit?
 - Yes we need one
- Permit to lower groundwater?
 - Yes we need it
- Culture heritage – permits?
 - Investigations as we remediate
- Restrictions of preservation nature?
 - No
- Permit to demolate buildings?
 - Yes we need to get permission to demolate buildings
- Permit to demolish concrete?
 - Yes we need permit to crushe concrete
- Protect vegetation such as special trees from damage
 - No need



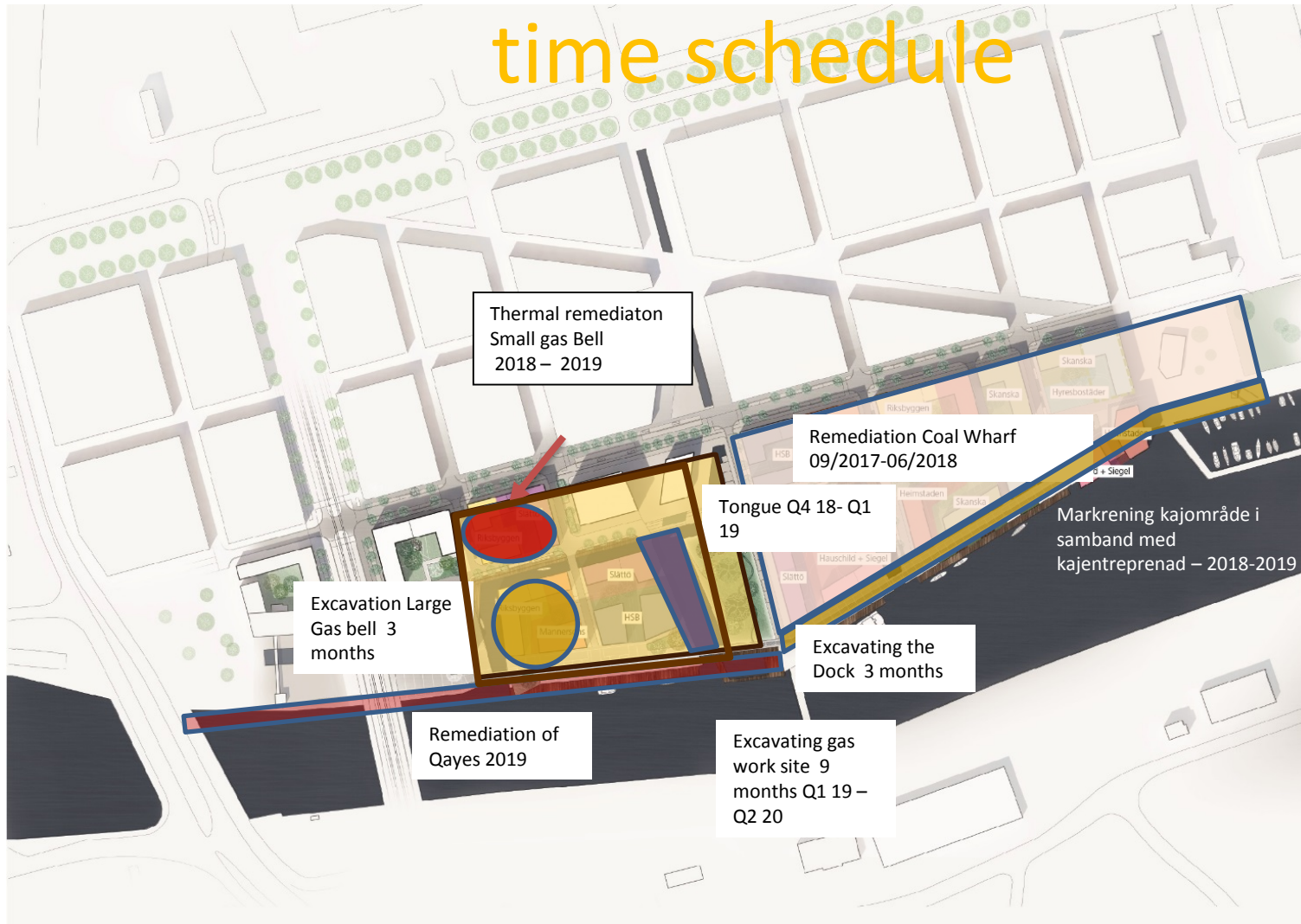
Most work consuming so far

- Compiling the application of permit to lower the groundwater
- Compiling the application to get financial allowance from the Swedish USEPA
- Complete the report of the Survey of the gaswork site
- Develop guideline values to drainage water from excavation
- Get relevant soil remediation goals



Inner harbour Norrköping Remediation

time schedule





Part two: 2 Remediation of the Inner harbour

Conclusions

How contamination affects planning:

How contaminated is the land?

-Is it possible to remediate the soil prior to the land use?

What are the costs to remediate the soil to resident use?

At Inner harbour the costs to remediate the Coal wharf is estimated to about 5 M Euro

The Gasworks site 10-20 M Euro

Time consuming -3-10 Years of preparations – 2-3 Years of remediation





Thank You for listening

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Position

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