

Block I General details	
1	<p>Location of the PCB disposal facility:</p> <p>Name of Facility: Stena Gotthard AB City: Gothenburg Country: Sweden <i>(Provide address information in Block IV)</i></p>
2	<p>Licence / authorization:</p> <p>Is this facility licensed or authorized to handle PCBs? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>If "Yes": (i) Nature of licence / authorization: The County Administrative Board and the Environmental Court (ii) Please submit the licensing history <i>(please attach to this questionnaire)</i></p> <p>Issuing authority (<i>name</i>): The County Administrative Board in Värmland <input checked="" type="checkbox"/> National <input type="checkbox"/> Local or <input type="checkbox"/> Independent</p>
3	<p>Please provide information on storage at the facility including:</p> <p>Capacity for the various PCB waste and equipment types: The capacity is 7000-8000 transformer per year. Today, the amount of transformer to be handled is about 2500. Approximately 10 % of all transformers in Sweden contain PCB.</p> <p>Method: See enclosure 2.</p> <p>Holding time: 2-4 weeks</p>
4	<p>Worker protection <i>(Please summarize protective measures applied during treatment of PCB wastes)</i>. Where PCB:s are involved, special safety procedures, protective clothing, goggles, gloves and masks are used. All the employed also have to be educated</p> <p>Does the facility have an accident book? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p> <p>Most frequent cause(s) of incidents involving PCBs: The incident of getting PCB on the skin. This risk is eliminated when safety protective clothing is used.</p>

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Opinion box - PCB Management issues *(Please describe briefly)*

What are your major concerns? The main problem today is the situation that actors generally within the industry estimates a transformer containing PCB, but a lower amount than 50 ppm as free from PCB. Another problem is that much of the material still will be destructed in an unsustainable way.

Can you identify research and development needs in PCB management that would be beneficial for your region and waste managers worldwide? It will be important to develop a simple method to analyse PCB-contaminated material within our facilities, instead of getting extern support for this issue.

Block II Types of PCB wastes

Part A: Treatment of PCB containing equipment/material

Part A1: Metallic Parts

A1.1

Types of metallic PCB equipment/material treated:

Limitation on waste accepted
(please specify, if appropriate)

Concentration <i>(specify the unit)</i>		Quantity <i>(specify the unit)</i>
unit:		unit:
min	max	

Equipment containing 100 % PCB

Equipment containing mineral oil contaminated by PCB

Others:

Please specify any other limitation on waste accepted:

A1.2

Presentation of metallic equipment/material

In what form must the metallic PCB equipment/material be presented:

Drums

Other packaging:

Other constraints:

A1.3

Treatment of metallic PCB equipment/material

Immediate destruction of metallic equipment/material containing PCB? Yes No

If 'Yes', please specify the applied technology in Part III

Extraction of PCB? Yes No

If 'Yes':

- please specify the applied technology in Part III
- Is the decontaminated metallic equipment/material subjected to reuse/recycling? Yes No

If 'Yes', please specify in **Block II Part C** (Reuse and recycling)

Part A: Treatment of PCB containing equipment/material

Part A2: Non-metallic Parts

A2.1	Types of non-metallic PCB equipment/material treated:	Limitation on waste accepted <i>(please specify, if appropriate)</i>	
		Concentration <i>(specify the unit)</i>	Quantity <i>(specify the unit)</i>
		unit:	unit:
		min	max
	<input type="checkbox"/> PCB-containing materials (clothes, cables, etc.)		
	<input type="checkbox"/> PCB-contaminated residues, sludges		
	<input type="checkbox"/> PCB-contaminated soils and sediments		
<input type="checkbox"/> Packaged / drummed waste			
<input type="checkbox"/> Other:			
<i>Please specify any other limitation on waste accepted:</i>			
A2.2	<p>Presentation of non-metallic equipment/material</p> <p>In what form must the non-metallic PCB equipment/material be presented:</p> <input type="checkbox"/> Drums <input type="checkbox"/> Other packaging: <input type="checkbox"/> Other constraints:		

A2.3

Treatment of non-metallic PCB equipment/material

Immediate destruction of non-metallic equipment/material containing PCB? Yes No

If 'Yes', please specify the applied technology in Part III

Extraction of PCB? Yes No

If 'Yes':

- please specify the applied technology in Part III
- Is the decontaminated non-metallic equipment/material subjected to reuse/recycling? Yes No

If 'Yes', please specify in **Block II Part C** (Reuse and Recycling)

Part B: Treatment of PCB oils and PCB waste oils

B1

Types of PCB oils and PCB waste oils treated:	Limitation on waste accepted <i>(please specify, if appropriate)</i>		
	Concentration <i>(specify the unit)</i>		Quantity <i>(specify the unit)</i>
	unit:		unit:
	min	max	
<input type="checkbox"/> 100 % PCB oils			
<input type="checkbox"/> Mineral oils contaminated by PCB			
<input type="checkbox"/> Waste oils contaminated by PCB			
<input type="checkbox"/> Other:			
<p><i>Please specify any other limitation on waste accepted:</i></p>			

B2

Presentation of PCB oils and PCB waste oils

In what form must the PCB oils and PCB waste oils be presented:

- Drums
- Other packaging:
- Other constraints:

B3

Treatment of PCB oils and PCB waste oils

Please specify the applied technology for the destruction of PCB oils and PCB waste oils in Part III

Part C: Reuse & Recycling of decontaminated PCB equipment/material

C1

Types decontaminated PCB equipment/material treated:	Limitation on waste accepted <i>(please specify, if appropriate)</i> Quantity <i>(specify the unit)</i> unit:
<input checked="" type="checkbox"/> Transformers <input type="checkbox"/> Capacitors	300 per year.
<input checked="" type="checkbox"/> Materials (clothes, <u>cables</u> , etc.)	70 tones per year
<input type="checkbox"/> Residues, sludges	
<input type="checkbox"/> Soils and sediments	
<input type="checkbox"/> Other:	

Please specify any other limitation on waste accepted:

C2

Presentation of decontaminated PCB equipment/material

In what form must the decontaminated PCB equipment/material be presented:

- Drums ??
- Other packaging:
- Other constraints:

C3

Treatment of decontaminated PCB equipment/material

Reuse and Recycling of decontaminated PCB equipment/material? Yes x No

If 'Yes', please specify the applied technology in Part III

Is the decontaminated PCB equipment/material disposed of? Yes x No

If 'Yes', please specify: The material, such as oil, mercury etc. will be transported for destruction.

Transport to the disposal site? Yes x No

If 'Yes':

International transport

x National transport

Location of disposal site: SAKAB in Kumla, Sweden.

Please provide a short description of disposal site: SAKAB is a plant which will handle mainly all kind of hazardous waste from the Swedish industry.

Block III Detailed information on applied technologies		
1	The following description refers to Block II, Part:	Type of PCB waste or decontaminated equipment/material:
	<input type="checkbox"/> A1 (Treatment of metallic PCB equipment/material)	
	<input type="checkbox"/> A2 (Treatment of non-metallic PCB equipment/material)	
	<input type="checkbox"/> B (Treatment of PCB oil and PCB waste oil)	
	<input checked="" type="checkbox"/> C (Reuse and recycling of decontaminated PCB equipment/material)	Transformers, Condensers and Cables
2	<p>Applied technologies (Please specify the technology used for disposal). Sätt ditt kryss i rätt ruta.</p> <p><input type="checkbox"/> Pyrolysis / gasifiers</p> <p><input type="checkbox"/> Gas Phase Chemical Reduction (GPCR)</p> <p><input type="checkbox"/> Base Catalysed Decomposition (BCD)</p> <p><input type="checkbox"/> Sodium Reduction</p> <p><input type="checkbox"/> Super-Critical Water Oxidation (SCWO)</p> <p><input type="checkbox"/> Plasma Arc</p> <p><input type="checkbox"/> Molten Salt Oxidation</p> <p><input type="checkbox"/> Solvated Electron Technology</p> <p><input type="checkbox"/> Retrofilling</p> <p><input checked="" type="checkbox"/> Other: Cable granulation.</p> <p>Type of technology (1-sentence description):</p> <p>Dismantling of transformers, cables and other electrical equipment, and decommissioning of large equipment and drainage of PCB at customer site.</p> <p>Description of the technology please provide additional information as appropriate (<i>summarize here and, if necessary, attach documentation</i>)</p> <p>A new technique is under development, but the technique is not yet tested and therefore, the presentation of the technique will follow as soon as the technique is tested. More information will follow later.</p> <p>Commissioned? <input type="checkbox"/> Yes <input type="checkbox"/> No Year:</p> <p>Can the technology be used in a mobile facility? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>	

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State of development

Does the technology exist as an industrial unit? Yes No

If "No", please indicate when it will become operational:

If "Yes", please indicate how many units exist:

In what countries:

4

Pretreatment:

Does the technology require any pretreatment procedures? Yes No

If "Yes", please specify required pretreatment procedures:

- Thermal Desorption
 Dilution
 Low Temperature Rinsing
 Electro-osmosis
 Draining/Solvent washing
 Dismantling/Shredding
 Other:

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Byproducts

What byproducts does the technology produce? *(please specify below)*

Byproduct	Kind	Amount
Liquids:	Oil, mercury	300 L per tonnes of waste treated
Solids:	Paper, wood	100 kg per tonnes of waste treated
Air:		m ³ per tonnes of waste treated

Does the technology allow all byproducts to be monitored for POPs*/PTS** before release? Yes No

If POPs*/PTS** are discovered, can the byproducts be returned to the process for further treatment? Yes No

Are any of the byproducts classified as other sorts of hazardous wastes? Yes No

If "Yes" please specify:

What volumes of such byproducts are generated by handling a unit volume of PCB wastes:

Can third party monitoring data be provided? Yes No

If "Yes", please attach to this questionnaire.

* POPs: Persistent Organic Pollutants

** PTS: Persistent Toxic Substances

How are byproducts disposed of? *(please describe briefly)*

The by products are transported for destruction. They are transported to SAKAB in Kumla.

6	<p>Efficiency</p> <p><i>(please specify, if appropriate)</i> 80 % of the material will be recycled. The remaining part will be transported for destruction.</p> <p>Destruction efficiencies (DEs): 20 %</p>
7	<p>Monitoring & Control of releases (Kryssa för det som stammer).</p> <p>What technologies are used to monitor releases: The monitoring of releases is performance through reports to the environmental authority. No special technologies are used for this purpose.</p> <p>Air:</p> <p>Effluents:</p> <p>Solids:</p> <p>Are all releases monitored for POPs/PTS before release? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>If POPs*/PTS** are discovered, can the releases be returned to the process for further treatment? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Are any of the releases classified as hazardous wastes? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>If "Yes" please specify:</p> <p>What technologies are used/ required to monitor and treat any such releases prior to release:</p> <p>What volumes of such releases are generated by handling a unit volume of PCB wastes:</p> <p>Is third party monitoring data available? <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p><i>If "Yes", please attach to this questionnaire.</i></p> <p style="text-align: right;">* POPs: Persistent Organic Pollutants ** PTS: Persistent Toxic Substances</p>
	<p>How are releases disposed of? <i>(please describe briefly)</i></p> <p>The presentation will be available in the environmental report to the local and national authority.</p>

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Disposal costs (Skriv gärna I uppgifter om ni har prisuppgifter).

What are the *approximate* costs for applying the technology per unit[‡], **including** costs for all technical pretreatment steps, **excluding** all costs **not** related to the technical application of the technology (transport costs, costs for disposal of decontaminated transformers/capacitors/materials, etc.)?

Please specify type of treated/disposed PCB equipment/material/oil below:

	Costs per unit [‡]	Currency
a)		
b)		
c)		
d)		
e)		
f)		
g)		

[‡] Specify the unit for a) to g):

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Treatment capacities and scaling (tonnes per year for main waste & equipment types)

Capacity of existing facilities: units[‡] per year: 7000-8000 transformers per year.

Can the technology be adapted to higher or lower capacities? Yes No

If "Yes":

- (i) What is the capacity of the smallest commercially viable facility: units[‡] per year
- (ii) What is the capacity of the largest commercially viable facility: units[‡] per year

Does the adaptation will cause additional costs? Yes No

If "Yes" specify the increase in costs for the adaptation (%) of the initial costs:

- (i) For smaller plants: %
- For larger plants: %

[‡] Please specify the unit:

Block IV**Facility: Address and Service Information****1**

Facility Name: Stena Gotthard AB, Transformatoranläggning

Address: Östanvindsgatan 14

City/Town: Karlstad

P.O. Box: SE 652 21 Karlstad

District/State: Karlstad, Värmlands län.

Country: Sweden

Telephone: + 46 (0)54 -854822

Fax: + +46 (0)54 854825

Email: jeff.nilsson@stenaGotthard.se

Web site: www.stenaGotthard.se

Person completing form

Name: Jeff Nilsson

Position: Director

Parent Company (*if different*)

Address: Fiskhammsgatan 8B

City/Town: Göteborg

P.O. Box: Box 4088, 400 40 Göteborg

District/State: Västra Götaland

Country: Sweden

Telephone: +46 (0) 31 7752000

Fax: + 46 (0) 31 144825

Email:

2	<p>Other Services offered by the company</p> <p><input checked="" type="checkbox"/> Laboratory analysis / testing</p> <p><input type="checkbox"/> PCB waste packaging for shipment</p> <p><input type="checkbox"/> PCB classification / labeling</p> <p><input type="checkbox"/> Clean-up of PCB contaminated sites</p> <p><input type="checkbox"/> PCB wastes transport</p> <p><input type="checkbox"/> Other PCB-related services:</p>
3	<p>Further information</p> <p>Identify any company information (brochures, notes etc...) provided separately and if you wish provide additional comments on your services in not more than 50 words:</p> <p>The brochures "Don't waste resources while dealing with PCB problems", will be enclosed and sended to you by post.</p>

Enclosure 1

Licensing history

Before the company received the license to handle PCB contaminated waste 2000, all the PCB contaminated wastes was transported for destruction to the company SAKAB in Sweden. In order to increase the recycling of the material, an application was sent to handle and dismantling the material at the place in Karlstad, instead of sending the material to SAKAB. This application resulted in that the Stena Gotthard plant in Karlstad improved the recycling of material to a degree of 80 %. The process to get the license was ongoing in approximately 24 months.

Enclosure 2

Method to handle transformers and condensers

After arriving to Stena Gotthards transformers facilities in Karlstad, each transformers has its own registered ID number, which follows it until final dismantling. The information is maintained in a customized computer system. All PCB transformers are stored and processed at room temperature in a lined, reinforced area under cover. Before scrapping can begin, oil is drained for 1-2 days and collected in different tanks depending on whether or not it contains levels of PCB. Any remaining oil is removed using absorbents. This process automatically generates detailed waste statistics in compliance with government requirements. The data will be used in the company's environmental report.