

# Manual for the user of ALLASKA

It should be possible to use ALLASKA without prior experience, but questions always arise. The purpose of this short manual is to answer the most common questions and to facilitate for the inexperienced to get a start.

**ALLASKA**

Database within the programme on ashes at Värmeforsk  
**Environmentally correct utilisation of ashes**

The purpose of this database is to collect quantitative information on the properties of residues from combustion. These ashes were produced at Swedish combustion plants.  
Data originate primarily from the programme on ashes at Värmeforsk.  
The database has been created by ÅF Consult AB on behalf of Värmeforsk.  
Updated 2011-07-14

Change language to Swedish

Warning! Swenglish mixed text in database! Read manual!

Only 100% of a fuel:

Fill in one or several search options.  
Leave empty for "all" (no condition).

Show count in selection:   
This function takes a long time

Type of ash:

Fuel:

Type of boiler:

Discharge:

Application:

Organic substances:

Plant:

Boiler:

Geotechnical properties

Leaching properties

Composition

Particle size

Organic substances

Boilers

Reset all conditions

Documents:  
[Manual >](#)  
[Meaning of ash >](#)  
[Download a copy of the database >](#)  
[Data to Allaska >](#)  
[Uncertainties and limits of quantification >](#)

UK 1178

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## Searching

', 'Type of ash:', 'Fuel:', 'Type of boiler:', 'Discharge:', 'Application:', 'Organic substances:', 'Plant:', 'Boiler:'. Each filter has a dropdown menu. In the center, it says 'Fill in one or several search options. Leave empty for "all" (no condition)'. On the right, there is a 'Show count in selection: ' checkbox and the text 'This function takes a long time'. Below this are several buttons: 'Geotechnical properties' (78 ash samples), 'Leaching properties' (275 ash samples), 'Composition' (739 ash samples), 'Particle size' (132 ash samples), 'Organic substances' (3 ash samples), 'Boilers' (92 boilers), and 'Reset all conditions'. At the bottom right, there is a 'Documents:' section with links: 'Manual >', 'Meaning of ash >', 'Download a copy of the database >', 'Data to Allaska >', and 'Uncertainties and limits of quantification >'. In the bottom left corner, the text 'UK 1178' is visible."/>

**ALLASKA**

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Only 100% of a fuel:

Fill in one or several search options.  
Leave empty for "all" (no condition).

Show count in selection:   
This function takes a long time

Type of ash:	<input type="text"/>	Geotechnical properties	78 ash samples
Fuel:	<input type="text"/>	Leaching properties	275 ash samples
Type of boiler:	<input type="text"/>	Composition	739 ash samples
Discharge:	<input type="text"/>	Particle size	132 ash samples
Application:	<input type="text"/>	Organic substances	3 ash samples
Organic substances:	<input type="text"/>	Boilers	92 boilers
Plant:	<input type="text"/>	Reset all conditions	
Boiler:	<input type="text"/>		

Documents:  
[Manual >](#)  
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[Uncertainties and limits of quantification >](#)

UK 1178

All help texts may be shown either in Swedish or in English. Click on the flag to choose the language.

When you click on any of the four buttons to the right, a search is initiated in the data that have been entered into ALLASKA. A report then presents the summary of the result.

To limit the search to those ashes that are interesting for you, choose conditions in the menus to the left on the screen. Please note that these are pre-selected conditions. If you wish to have all categories in a menu, leave this row blank.

You can limit the result to ash samples that only has 100% of one fuel through a checkbox.

If there are no ash samples in ALLASKA that meet all the conditions that you selected, ALLASKA returns the answer: "No ash samples in the selection" in red bottom left.

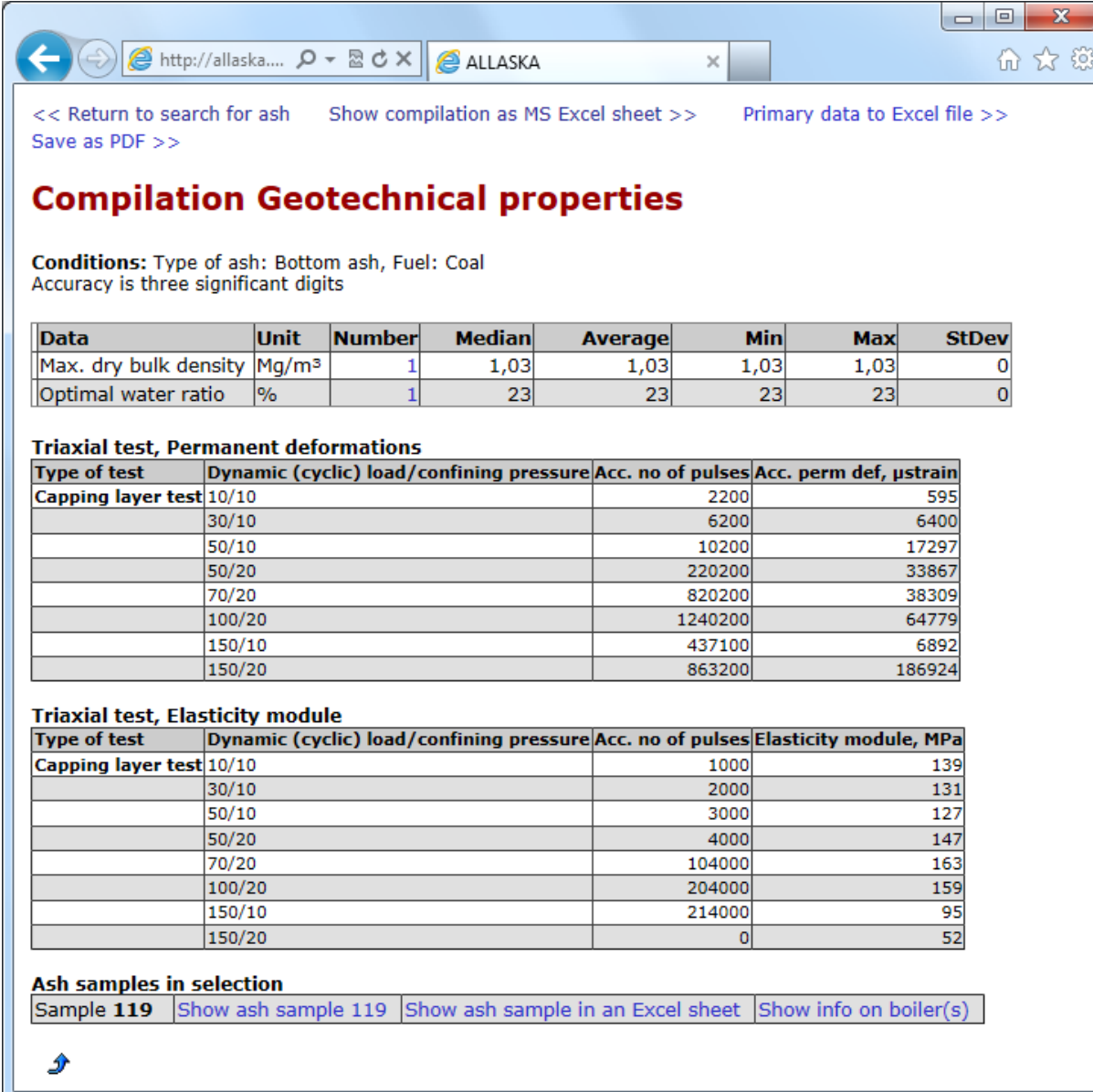
You may pre-view the number of samples in your selection by switching on the cell "Show number of samples in the selection". This may take some time as ALLASKA will search through all samples in the database, as much time as doing a real search.

When you click on the button "Boilers" to the right, a report will be shown on which boilers have contributed ash samples in the selection.

By clicking "Reset all conditions" the search forms will be restored to their original conditions.

In list with documents You can choose this manual and other information.

## Reports



The screenshot shows a web browser window with the URL <http://allaska...> and the page title "ALLASKA". The browser address bar contains navigation icons and the text "http://allaska...". The page content includes navigation links: "<< Return to search for ash", "Show compilation as MS Excel sheet >>", "Primary data to Excel file >>", and "Save as PDF >>".

### Compilation Geotechnical properties

Conditions: Type of ash: Bottom ash, Fuel: Coal  
Accuracy is three significant digits

Data	Unit	Number	Median	Average	Min	Max	StDev
Max. dry bulk density	Mg/m <sup>3</sup>	1	1,03	1,03	1,03	1,03	0
Optimal water ratio	%	1	23	23	23	23	0

#### Triaxial test, Permanent deformations


Type of test	Dynamic (cyclic) load/confining pressure	Acc. no of pulses	Acc. perm def, µstrain
Capping layer test	10/10	2200	595
	30/10	6200	6400
	50/10	10200	17297
	50/20	220200	33867
	70/20	820200	38309
	100/20	1240200	64779
	150/10	437100	6892
	150/20	863200	186924

#### Triaxial test, Elasticity module

Type of test	Dynamic (cyclic) load/confining pressure	Acc. no of pulses	Elasticity module, MPa
Capping layer test	10/10	1000	139
	30/10	2000	131
	50/10	3000	127
	50/20	4000	147
	70/20	104000	163
	100/20	204000	159
	150/10	214000	95
	150/20	0	52

#### Ash samples in selection

Sample 119	<a href="#">Show ash sample 119</a>	<a href="#">Show ash sample in an Excel sheet</a>	<a href="#">Show info on boiler(s)</a>
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The report presents statistical information for each variable (average, median, minimum and maximum, standard deviation) as well as the number of values available for each variable.

### Compilation Geotechnical properties

Also shows Triaxial test, Permanent deformations and Elasticity module.

### Compilation of the ash composition

You can choose to display the values of oxide or show elemental without oxygen.

[Return to search for ash](#)    [Show compilation as MS Excel sheet >>](#)    [Primary data to Excel file >>](#)  
[Save as PDF >>](#)

## Compilation Ash composition

**Conditions:** All  
 Accuracy is three significant digits

Show as oxide  
 Show as element without oxygen

Data	Unit	Number	Median	Average	Min	Max	StDev
137Cs		2	885	885	460	1310	601
Ag	mg/kg dry substance	49	5,75	6,39	0,64	16,2	3,96
Al2O3	% dry substance	679	7,37	7,79	0,12	86,9	6,07
As	mg/kg dry substance	647	33,9	86,5	0,1	3180	213
.	% drv						

## All compilations

During the compilation are the askprov that supplied data for the compilation.

The report can also be opened by Microsoft Excel. Click on the link [Show compilation as MS Excel sheet >>](#). The screens can look very different in different browsers. Choose preferably "Open".

Possible warning. Microsoft Excel opens in new window. Want to save your results, choose File, Save As.

allReport.aspx [Skrivskyddad] - Microsoft Excel

Arkiv    Start    Infoga    Sidlayout    Formler    Data    Granska    Visa    Acrobat

fx    Autosumma    Logik    Definiera namn    Spåra överordnade  
 Senast använda    Text    Använd i formel    Spåra underordnade  
 Finans    Datum/tid    Skapa från markering    Ta bort pilar    Bevakningsfönster    Beräkningsalternativ

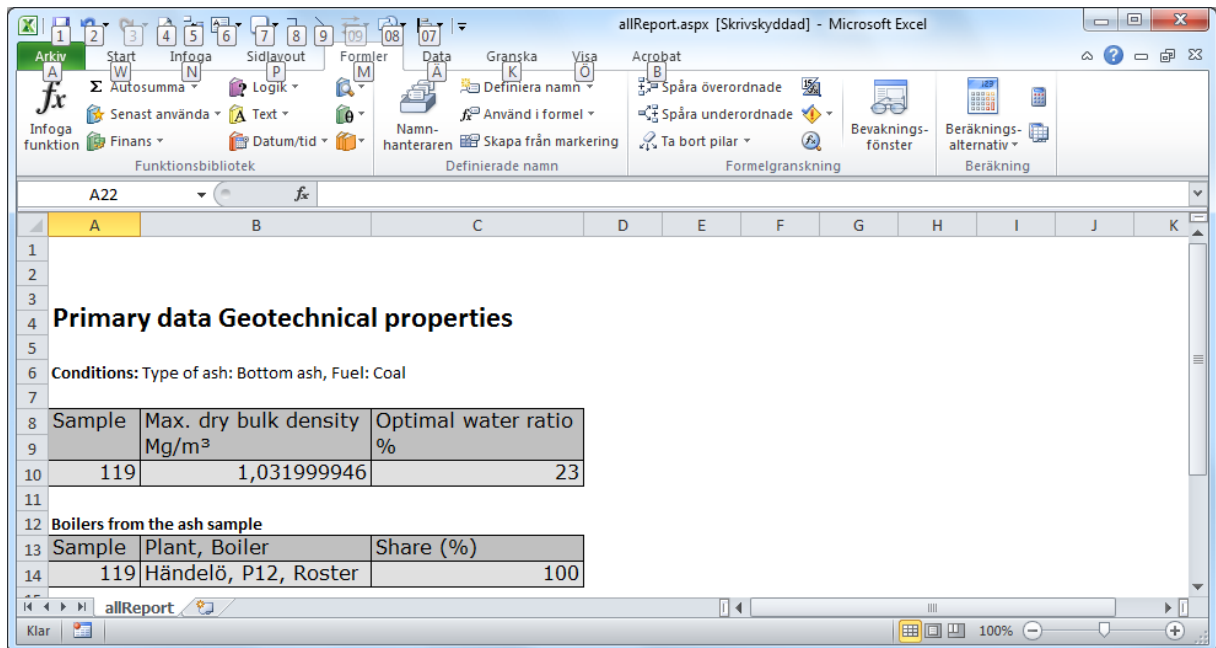
Funktionsbibliotek    Definierade namn    Formelgranskning    Beräkning

A25    fx

Data	Unit	Number	Median	Average	Min	Max	StDev
Max. dry bulk density	Mg/m <sup>3</sup>	1	1,03	1,03	1,03	1,03	0
Optimal water ratio	%	1	23	23	23	23	0

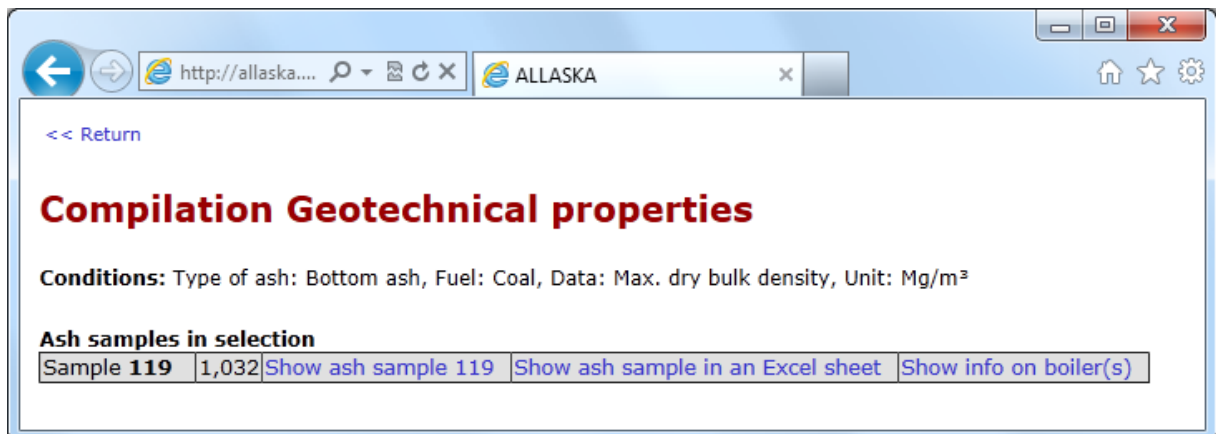
allReport

Another way to see data about the sample is in pivot form. Click on the link [Primary data to Excel file >>](#).



You can also save all data on the screen as a PDF. Click on the link [Save as PDF >>](#). Dialog box may appear different in different browsers. Select "Open".

Although there are 40 samples in the selection, data for a particular variable may have been contributed by only seven samples. To see which these are, click on the figure in the column number in the compilation. A new report comes up with just these samples.



For each sample, you can obtain additional information on the sample (on screen or as Excel sheet) and information about the boiler that delivered the ashes.

## Show Ash sample

To choose a report of an ash sample click the link [Show ash sample no](#) for a page in the browser or [Show ash sample in an Excel sheet](#) to get an Excel sheet.

http://allaska... ALLASKA

<< Return to search for ash

## Ash sample no 86

### 1. Type of ash

Title	Bottom ash 1 from Händelö's boiler 11, Sydkraft	Source	Värmeforsk report 856, Jan 2004, and 930, May 2005
Discharge, principle	Wet	Description	
Discharge, time	2003-03-07		From the project "A simplified test methodology for quality assurance - Phase 1". Sample: Limpa 1 Händelö boiler 11 Norrköping/Händelö, Wood ash "no 1"
Treatment			
Type of sample	Sub-sample	Test method	High
Application	Unknown	Sample taken (time)	2003-03-07, kl 7:20-14:30
Load	50 MW		

Type of ash	Type of ash, Sublevel	Share (%)	Notes
Bottom ash	-	100	

### 2. Particle size

Mesh size	Value	Unit	Method
0,063 mm	7,3	% pass	EN 933-1
0,125 mm	8,9	% pass	EN 933-1
16 mm after compaction	98,2	% pass	EN 933-1
31,5 mm after compaction	100	% pass	EN 933-1
45 mm after compaction	100	% pass	EN 933-1

### 3. Geotechnical properties

Data	Value	Unit	Method
Bulk density	1000	kg/m <sup>3</sup>	
Max. dry bulk density	1,047	Mg/m <sup>3</sup>	prEN13286-2
Optimal water ratio	30,2	%	prEN13286-2
Stiffness (resilient modulus), 20 kPa	23	MPa	
Stiffness (resilient modulus), 27 kPa	20	MPa	
Stiffness (resilient modulus), 33 kPa	20	MPa	
Stiffness (resilient modulus), 43 kPa	25	MPa	
Stiffness (resilient modulus), 50 kPa	30	MPa	
Stiffness (resilient modulus), 60 kPa	28	MPa	
Stiffness (resilient modulus), 77 kPa	28	MPa	

### 4. Composition

Data	Value	Unit	Method
Al <sub>2</sub> O <sub>3</sub>	8.1	% dry substance	
CaO	9.6	% dry substance	
Fe <sub>2</sub> O <sub>3</sub>	8.3	% dry substance	
K <sub>2</sub> O	2.2	% dry substance	
LOI, 1000 °C	15.5	% dry substance	
LOI, 550°C	11.5	% dry substance	
LOI, 800/850°C	14	% dry substance	Non-accredited

## 5. Leaching properties

Type of test	Data	Value	Unit	Method
Two-stage leaching - L/S=10	Al	147	mg/kg dry substance	EN 12457-3
Two-stage leaching - L/S=2	Al	38.6	mg/kg dry substance	EN 12457-3
Two-stage leaching - L/S=2	As	0.025	mg/kg dry substance	EN 12457-3
Two-stage leaching - L/S=10	As	0.0966	mg/kg dry substance	EN 12457-3
Two-stage leaching - L/S=10	Ba	1.79	mg/kg dry substance	EN 12457-3
Two-stage leaching - L/S=2	Ba	0.196	mg/kg dry substance	EN 12457-3
Two-stage leaching - L/S=2	Ca	324	mg/kg dry substance	EN 12457-3
Two-stage leaching - L/S=10	Ca	759	mg/kg dry substance	EN 12457-3
Two-stage leaching - L/S=10	Cd	0.0026	mg/kg dry substance	EN 12457-3

## 6. Triaxial test

<b>Test no</b>	<b>633</b>	<b>Date</b> 2003-05-20	<b>150 mm</b>	<b>Height</b>	<b>300 mm</b>
		<b>Diameter</b>			
<b>Aimed degree of compaction</b>	<b>90 %</b>	<b>Achieved degree of compaction</b>	<b>67,6 %</b>		
<b>Aimed dry bulk density</b>	<b>0,942 Mg/m3</b>	<b>Achieved dry bulk density</b>	<b>0,707 Mg/m3</b>		
<b>Aimed relative water ratio (relative to optimum water ratio)</b>	<b>100 %</b>	<b>Achieved relative water ratio before test</b>	<b>96 %</b>	<b>Achieved relative water ratio before test</b>	<b>96 %</b>

Comments

### Permanent deformations Test no 633

Type of test	Dynamic (cyclic) load/confining pressure	Acc. no of pulses	Acc. perm def, µstrain
<b>Capping layer test</b>	10/10	100	119
	10/10	200	164
	10/10	300	187
	10/10	400	212
	10/10	500	225
	10/10	600	237
	10/10	700	246

### Elasticity module Test no 633

Type of test	Dynamic (cyclic) load/confining pressure	Acc. no of pulses	Elasticity module, MPa
<b>Capping layer test</b>	30/10		20
	10/10		23
	50/10		20
	50/20		25
	70/20		29
	100/20		28
	150/10		28

## 7. Organic substances

Name	CASno	Value	Unit	Method of analysis	Synonyms
Acenaphtene	000083-32-9	0.115	mg/kg		
Acenaphtylene	000208-96-8	6.3	mg/kg		
Anthracene	000120-12-7	0.75	mg/kg		
Benz(a)anthracene	000056-55-3	0.425	mg/kg		

## 8. Additives

## 9. Fuels

Fuel, main level	Sublevel	Form of fuel	Share of total fuel input (%)	Ash content (% TS)	Moisture content (%)
Waste	Recycled wood chips		100		

Comments:

## 10. Boilers from the ash sample

Plant, Term	Share (%)
Händelö, P11 Roster	100

In lists Composition, Leaching properties and Organic substances < (less then-sign) is shoed before the value when it is below the detection level. The value is included when calculated.

**Ash sample no 86**

**1. Type of ash**

Title Bottom ash 1 from Händelö's boiler 11, [Source Värmeforsk report 856, Jan 2004, and 930, May 2005](#)

Discharge, principle Wet

Discharge, time 2003-03-07

Treatment From the project "A simplified test methodology for quality assurance Phase 1". Sample: Limpa 1 Händelö boiler 11 Norrköping/Händelö, Wood ash "no 1"

Type of sample Sub-sample

Application Unknown

Load 50 MW

**2. Particle size**

Mesh size	Value	Unit	Method
0,063 mm	7,3	% pass	EN 933-1
0,125 mm	8,9	% pass	EN 933-1
0,25 mm	12,8	% pass	EN 933-1

The ash samples showed as Microsoft Excel.

## Show info on boiler(s)

For information on the boiler, click on the link "Show info on boiler(s)". This new report will show the information on the boiler, as well as the other ash samples that have been produced by the boiler.

<< Return to search for ash

## Boiler(s) for ash sample no 77

**Type of ash**

Title Ash 1a from Igelsta deposited in the landfill Tveta [Source Värmeforsk report 830, October 2003](#)

Discharge, principle Unknown

Discharge, time April/May 2002

Treatment Pelletized

Type of sample Random sample

Application Ash recycling to forests

Load 100 MW

**Boiler Söderenergi, Igelsta, P2 Pulver**

Main principle Pulverized fuel furnace

Comments Pulverized fuel furnace. The fly ash is discharged with the fly ash from boiler 1 (not the electrostatic precipitator ash) and boiler 3. The bottom ash is discharged with the bottom ash and the electrostatic precipitator ash from boiler 1.

Nominal capacity 120 MW

Year of construction

Ash recirculation No



**Separate discharge possible for:**

	N/A	No	Yes, dry	Yes, wet
Bottom ash	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fly ash	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cyclone ash	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Electrostatic precipitator ash	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Filter ash	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Flue gas cleaning:**

Principle	Comments
Electrostatic precipitator	

**Ash samples from this boiler:**

Ash sample
77 Ash 1a from Igelsta deposited in the landfill Tveta
78 Ash 2a from Igelsta deposited in the landfill Tveta
79 Ash 2b from Igelsta deposited in the landfill Tveta
80 Ash 2c from Igelsta deposited in the landfill Tveta
81 Ash 3a from Igelsta deposited in the landfill Tveta
82 Ash 1b from Igelsta deposited in the landfill Tveta
83 Ash 3b from Igelsta deposited in the landfill Tveta
84 Ash 4 from Igelsta deposited in the landfill Tveta
85 Ash 5 from Igelsta deposited in the landfill Tveta
367 Bottom ash from Söderenergi
368 Fly ash from Söderenergi
801 FA yta1 labb
802 BA yta2 labb
803 FA & BA yta4 labb

## Conditions in the search

All samples that have been entered in ALLASKA will form the basis of the report, if one leaves all cells to the left blank. However, the search may be restricted to those samples that are interesting to you by choosing from the preselected conditions.

Please note: Choose plant before choosing boiler.

## Are you missing values?

Do you miss values or samples that should have been returned by ALLASKA? There may be several reasons for that:

- Those who entered data into ALLASKA overlooked it.
- There may be data for this variable, but the test is not a standard test (this may be more frequent for leaching properties than for composition).
- The value reported for a sample may be below the level of detection – in this case no value has been entered. There are alternatives: one could have entered the value of the level of detection, half this value or zero. The choice would have influenced the mean and other statistical values returned by the search. At present, the user may judge by himself/herself by comparing the number of values for this variable, e.g. the concentration of mercury, with the number of values recorded for a similar variable, e.g. the concentration of chromium. To investigate further, please go to the original report.
- The performer of the investigation has not wished to divulge from which boiler this ash sample has been taken. Search instead for a boiler that has not been identified – the data may be there.
- The data were not published in a project financed by the programme “Environmentally correct use of ashes” or the regular RD&D programme at Värmeforsk or the national “Framework Programme Ash Recycling” 1992-1996.

## Download a copy of the database

You must have Microsoft Access version 2002 (XP) or later to use the database. Click on link beneath Documents: [Download a copy of the database »](#).