

Oskarshamn site investigation

Compilation and evaluation of data from monitoring of flushing water from KLX03 and KLX04

Karin Aquilonius, Erik Wijnbladh
Svensk Kärnbränslehantering AB

April 2005

Svensk Kärnbränslehantering AB

Swedish Nuclear Fuel
and Waste Management Co
Box 5864
SE-102 40 Stockholm Sweden
Tel 08-459 84 00
+46 8 459 84 00
Fax 08-661 57 19
+46 8 661 57 19



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Keywords: Aquatic environment, Conductivity, Salinity, Flushing water, pH, Infiltration.

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Abstract

During drilling activities in the site investigation programme in Oskarshamn flushing water has been infiltrated in the ground with nearby streams as recipients. To monitor the effects in the ground and surface water a monitoring programme was set up with focus on salinity and effects of salinity. In this report an evaluation of the results from the monitoring has been made. To sum up, there is no indication of rise in salinity (measured as conductivity) during the investigated period in the surface water, except for what is within the range of earlier observed natural variation. Therefore there is no reason to believe that the ecosystem in the streams has been negatively affected from salt in the flushing water.

Sammanfattning

Vid kärnbränningsaktiviteter i platsundersökningsprogrammet i Oskarshamn har spolvatten släpps ut på marken för infiltration och avledning till närliggande vattendrag. För att övervaka effekterna på grund- och ytvatten (framförallt med avseende på salthalt mätt som konduktivitet) genomfördes ett miljöövervakningsprogram. I denna rapport utvärderas resultaten från detta program. Sammanfattningsvis visar resultaten från övervakningen inte på någon effekt av spolvattnet på ytvattnets konduktivitet, utöver den naturliga variation som är uppmätt i tidigare mätningar. Av det skälet finns det ingen anledning att befara negativa effekter på vattenmiljön förorsakat av det uppumpade grundvattnets saltinnehåll.

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1 Introduction

This document reports the results gained by the activity “Vattenkemisk och ekologisk övervakning av Ekerumsbäcken vid utsläpp av spolvatten från KLX04” (Water chemistry and ecological monitoring of the stream Ekerumsbäcken, during release of flushing water from KLX04) and data from the surface water monitoring, during the release of flushing water from KLX03 drained into the stream Laxemarsån. The work was carried out in accordance with activity plan AP PS 400-04-022 (internal SKB controlling document).

This report gives a compilation and evaluation of the results gained in the monitoring, of water chemistry and ecological parameters, in the stream Ekerumsbäcken and of water chemistry in connection to KLX03. The flushing water from these boreholes has been lead to three sedimentation containers to a perforated tube and sprinkled out on the ground. After infiltration of the ground, the water reached a small ditch which drains in the streams, Figure 1-1.

Flushing water from drilling is continuously monitored for conductivity and is not to be released when the conductivity exceeds 300 mS/m, corresponding to a salinity of 2,000 mg/l.

The monitoring for KLX03 lasted from the start to the finalizing of the borehole, 2004-05-31 to 2004-09-08, and included analysis of outgoing flushing water and of water chemistry in the stream Laxemarsån.

The monitoring for KLX04 lasted from the start to the finalizing of the borehole, 2004-03-18 to 2004-06-28, and included analysis of outgoing flushing water and of water chemistry and bottom fauna in the stream Ekerumsbäcken.

The boreholes KLX03 and KLX04 and their drainage areas and sampling locations are show in Figure 1-2 and 1-3.

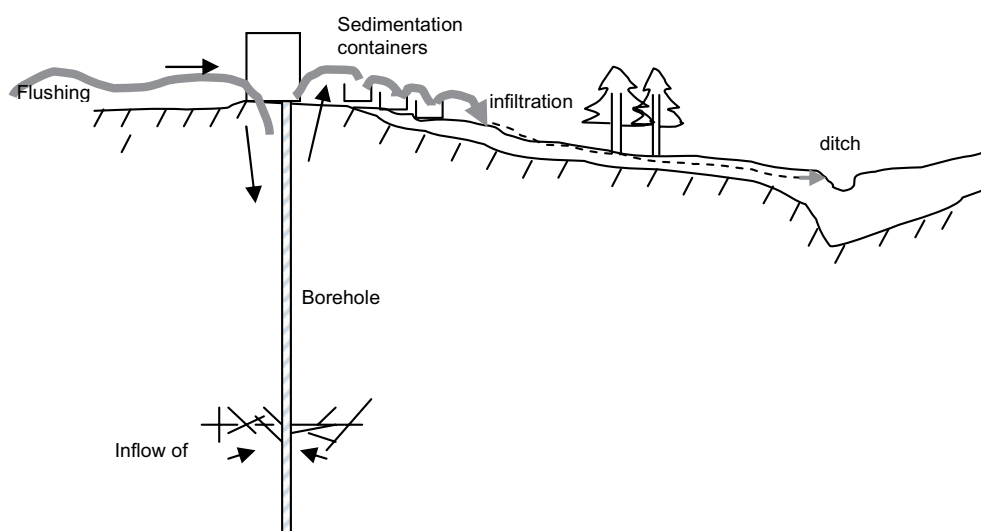


Figure 1-1. Schematic figure of flushing water treatment at the borehole KLX04 and KLX03.

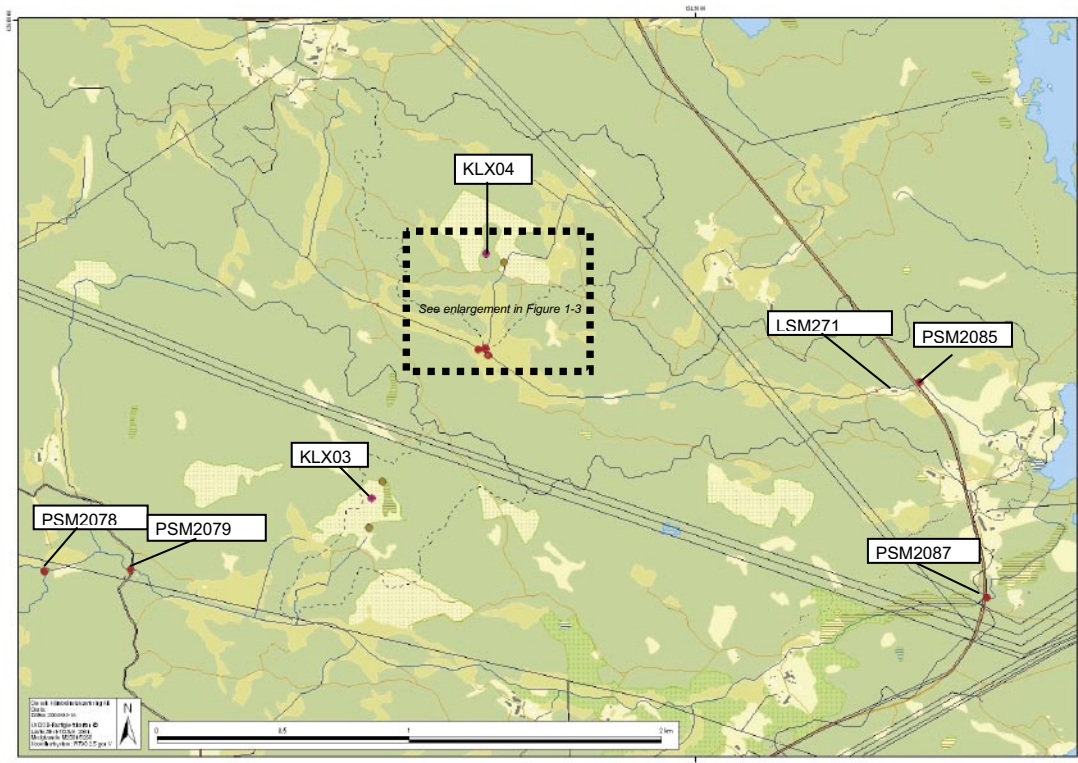


Figure 1-2. The boreholes KLX03, KLX04, Ekerumsbäcken, Laxemarsån and locations for sampling of water chemistry (PSM) and bottom fauna (LSM). Black lines indicate drainage areas and dotted lines, sub-drainage areas. See details in Figure 1-3.

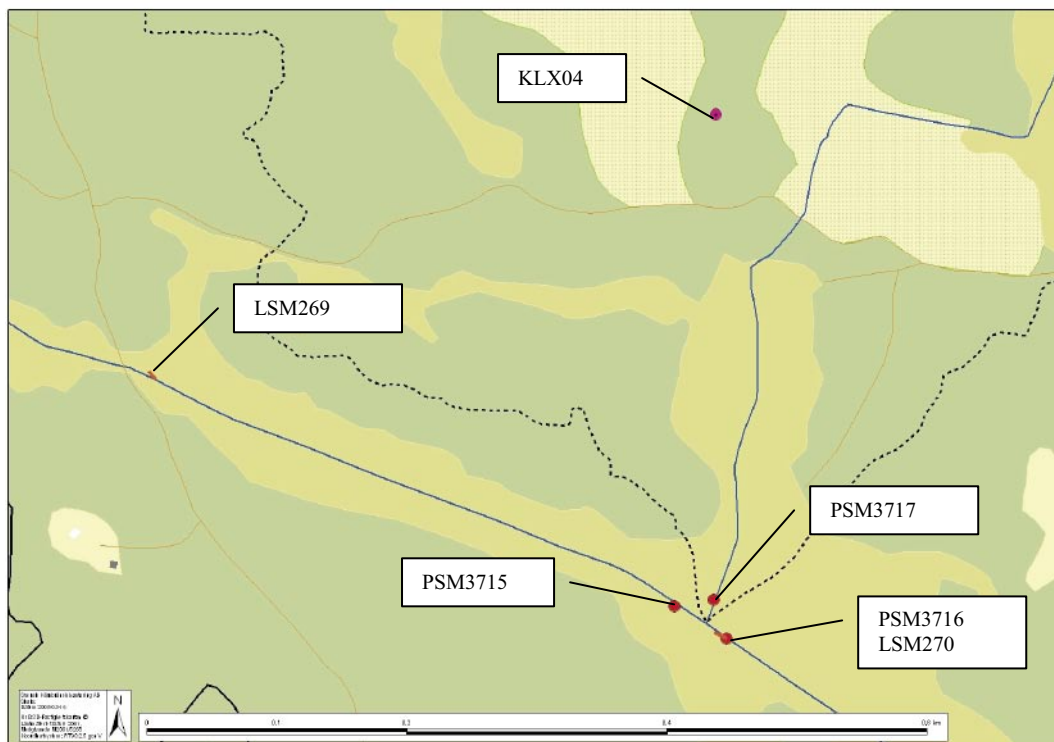


Figure 1-3. The borehole KLX04, Ekerumsbäcken, and locations for sampling of water (PSM) chemistry and bottom fauna (LSM), detail of Figure 1-2.

2 Objective and scope

The main objective of this activity have been to investigate if release and infiltration on the ground of flushing water from boreholes generates any negative effects on the water chemistry or the ecology of receiving watercourses.

Guidelines for release of effluent water were established by SKB and the regional County administration board (Länsstyrelsen i Kalmar län) was informed of these before the core drilling started. The limits for release of effluent water to the ground were:

- Salinity, 2000 mg/l (monitored as conductivity, with the limit 300 mS/l).
- Uranine, 0.3 mg/l.
- Suspended material, 600 mg/l.

3 Equipment

3.1 Description of equipment

3.1.1 Flushing water

The flushing water from drilling was continually logged for conductivity and water flow using a conductivity meter Kemotron 122-9221/30, 4–20 mA (mS/m) and water flow meter Aquaflux = 10 DN40 4–20 mA (0–180 litres/min). Two loggers were used; Datascan 7320 och Campbell CR10. Data recordings were made every minute. More details are given in SKB MD 321 004 (internal SKB controlling document).

3.1.2 Streams and ditches

Some of the parameters in the ditch and stream water were measured with YSI 6600 EDS multi-parameter probe. The probe is a torpedo-shaped water quality monitoring device that is immersed into the water to gather water quality data. The probe has multiple probes that measure several different parameters (Table 4-1). Calibration procedures have basically been performed according to instructions found in YSI Environmental Operations Manual.

For sampling of bottom fauna in the streams a hand net was used (Figure 3-1). The hand net had an opening of 25×25 cm and a mesh size of 0.5×0.5 mm. The samples were sifted in the field trough a sieve with a mesh size of 0.5×0.5 mm (Figure 3-1). The samples were then preserved in 70% ethanol /Ericsson and Engdahl, 2004/.

Magellan GPS 315: Used to obtain the exact location of the sites.



Figure 3-1. The hand net and sieve used in the streams.

3.1.3 Laboratory

Tube pump: Used in the laboratory to filter sampled water through 0.45 μm filter (PALL).
20 ml and 50 ml syringes: Used to filter sampled water in the laboratory as well as in field.
0.45 μm filter (PALL): Capsule filter used together with the tube pump.
0.45 μm filter Sterile-R: Single use filter used together with the syringes.

In the laboratory the animals were sorted out from the material using a magnifying glass and a stereo microscope. Identification was performed in a stereomicroscope (5–50X). For some species a light microscope with 400X magnification was used. The biomass was measured on an analytical balance with an accuracy of 0.1 mg.

4 Execution

4.1 General

The parameters included in the control program for KLX03 and KLX04 are presented in Table 4-1a and b respectively.

Table 4-1a. Environmental control KLX03.

Media	Probeparameters	Laboratory analysis	Sampling locations
Out going flushing water	Volume, electric Conductivity	Uranine concentration*, Conductivity	1
Ditch water	Temp, SpCond, Salinity, **DO %, **DO Conc, pH, ***ORP, water flow		1
Stream Laxemarsån	Temp, SpCond, Salinity, **DO %, **DO Conc, pH, ***ORP, water flow	HCO ₃ , Cl, SO ₄ , Br, F, pH, Conductivity	2 (up- and down stream ditch).

Table 4-1b. Environmental control KLX04.

Media	Probeparameters	Laboratory analysis	Sampling locations
Out going flushing water	Volume, Conductivity	Uranine concentration*, Conductivity	1
Ditch water	Temp, SpCond, Salinity, **DO %, **DO Conc, pH, ***ORP, water flow		1
Stream Ekerumsbäcken	Temp, SpCond, Salinity, **DO %, **DO Conc, pH, ***ORP, water flow	HCO ₃ , Cl, SO ₄ , Br, F, pH, Conductivity	2 (up- and down stream ditch).
• <i>Water chemistry</i>			
• Bottom fauna		Abundance, biomass, no of taxa	2 (after release of flushing water)–3 (before release of flushing water).

*uranine is a sodiumsalt (C₂₀H₁₀Na₂O₅)

**DO = Dissolved Oxygen

***ORP = Oxygen Reduction Potential,

The sampling locations are shown in Figure 1-2 and 1-3.

4.1.1 Flushing water

Volume and conductivity of the outgoing flushing water was for both boreholes continuously logged during the period of release and sub-samples were collected regularly, 1–2 times a month, for analysis in the laboratory. The measuring probe was placed before the water entered the sedimentation tanks, Figure 4-1.

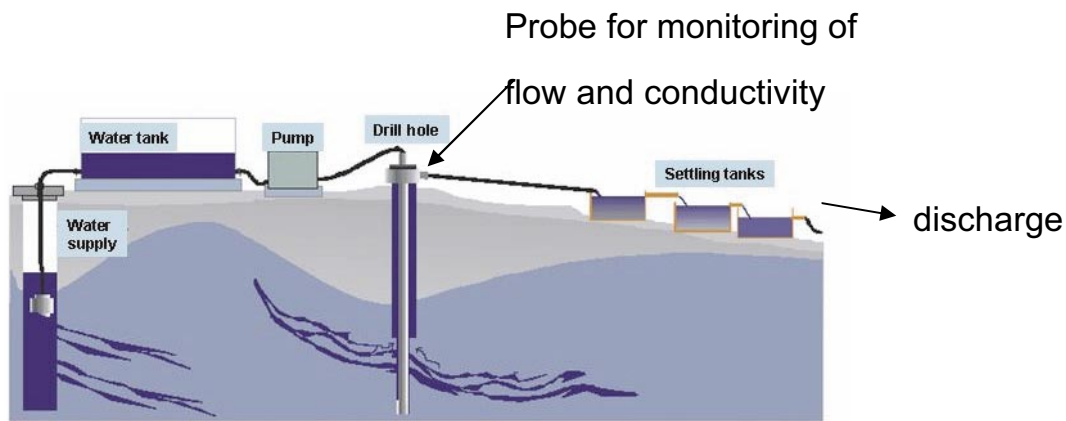


Figure 4-1. The flushing water system, placement of monitoring probe and settling tanks, from source to discharge point.

4.1.2 Surface water

The ditch water (PSM3717, see Figure 1-2) which drains into the stream Ekerumsbäcken was sampled (direct measurements) every second week from 2004-03-09 until 2004-07-13 during the year of 2004.

For the up- and downstream locations in the stream Ekerumsbäcken (PSM3715 and PSM3716 respectively) the water was sampled for laboratory analysis. Direct measurements with probe was performed as well as flow measurements, every second week from 2004-02-18 until 2004-07-13, 2004. Water flow has also been monitored every second week further down in Ekerumsbäcken, PSM2085, in the surface water monitoring programme (AP PS 400-03-079, internal SKB controlling document).

The stream Laxemarsån have three sampling locations (PSM2078, 2079 and 2087, see Figure 1-2), which are included in the site specific surface water sampling programme. These locations were sampled 1–2 times a month during 2004. One of them (PSM2087) is located downstream the borehole KLX03.

4.1.3 Bottom fauna

Bottom fauna was only sampled in the stream Ekerumsbäcken (LSM000269, 270 and 271, see Figure 1-2 and 1-3), according to the environmental control program for this borehole (KLX04). The sampling was performed at two occasions in three localities, one upstream and two downstream. The first sampling occasion was before release of the flushing water from KLX04, 2004-02-19 (LSM271), 2004-03-10 (LSM269) and LSM270). The sampling was repeated after the release had been in progress for four months, 2004-06-23 (LSM269 and LSM270). The sampling method used was kick sampling, according to the Swedish and European industrial standard SS EN 27 828. In addition the guideline from SEPA (Swedish Environmental Protection Agency) in the “Handboken för miljöövervakning” was followed for the method.

The samples were preserved in 70% ethanol and transported to the laboratory. The animals were sorted out from the material, counted and identified using a stereo microscope. The identification was driven to species level (if possible). The identification of dipterans was performed only to family level.

During sampling, field notes were taken at each sampling site in accordance with the guidelines from SEPA in the “Handboken för miljöövervakning”. The field notes are presented in Appendix 1.

4.2 Data handling/post processing

Field data were noted in field protocols. The field protocols for inventory of the bottom fauna are included in Appendix 1.

Data from the laboratory analyses were reported to the SICADA database.

4.3 Nonconformities

No nonconformities were recorded for the presented methods. However, analysis of shallow ground water was not performed as stated in the environmental control programme (MD300.003), only reference samples were taken. This will be corrected as from writing of this report, March 2005.

5 Results

5.1 Flushing water and surface water

5.1.1 KLX03

Totally for the period, approximately 1,200 m³ of flushing water have been released to infiltrate the ground at the borehole KLX03. The accumulated flushing water volume is shown in Figure 5-1.

The flow of the flushing water is shown in comparison with the surface water stations in Figure 5-2.

The flow of flushing water varied between 1–2% of the flow in the surface water, Laxemarsån.

Conductivity in flushing water and surface water in connection to KLX03 are shown in Figure 5-3.

The actual discharge and infiltration of flushing water on the ground never exceeded the limit of 300 mS/m at KLX03. A slight increase of conductivity in the surface water can be seen during the discharge period, but the increase is found both in the upstream and downstream sites. The measured conductivity is well within natural variation in the area.

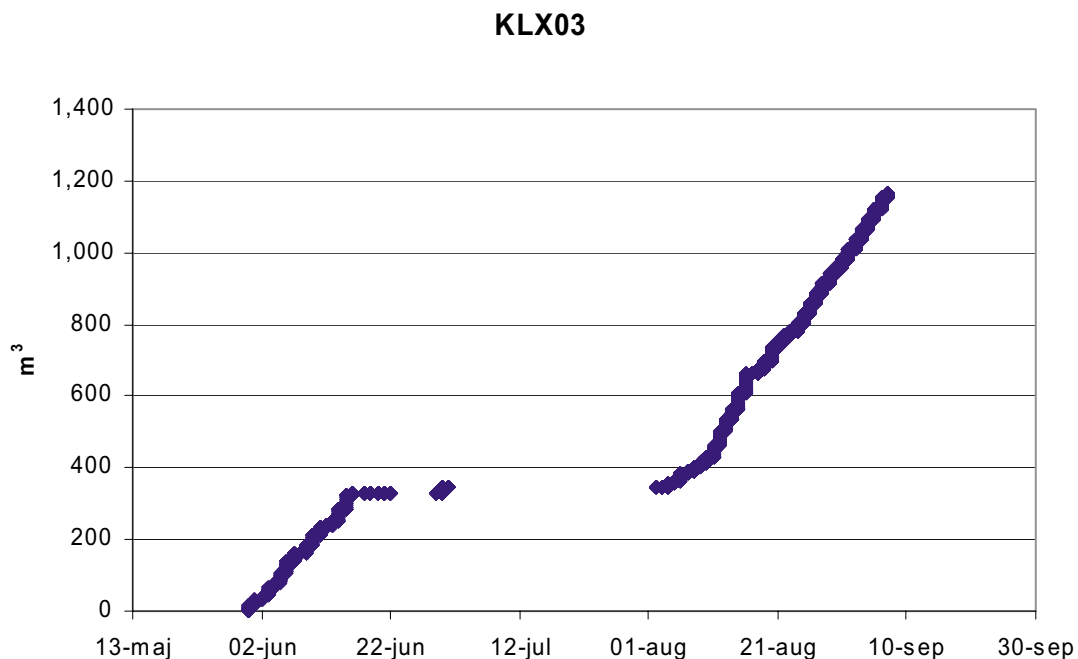


Figure 5-1. Accumulated volumes of flushing water from KLX03.

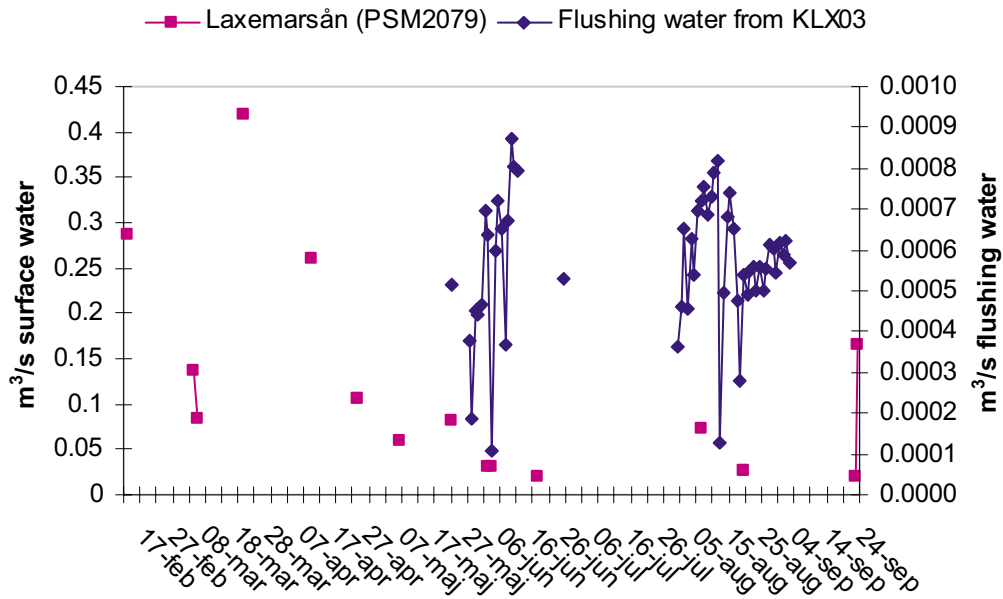


Figure 5-2. Water flow in m^3/s , of the stream water in Laxemarsån, and in flushing water from KLX03.

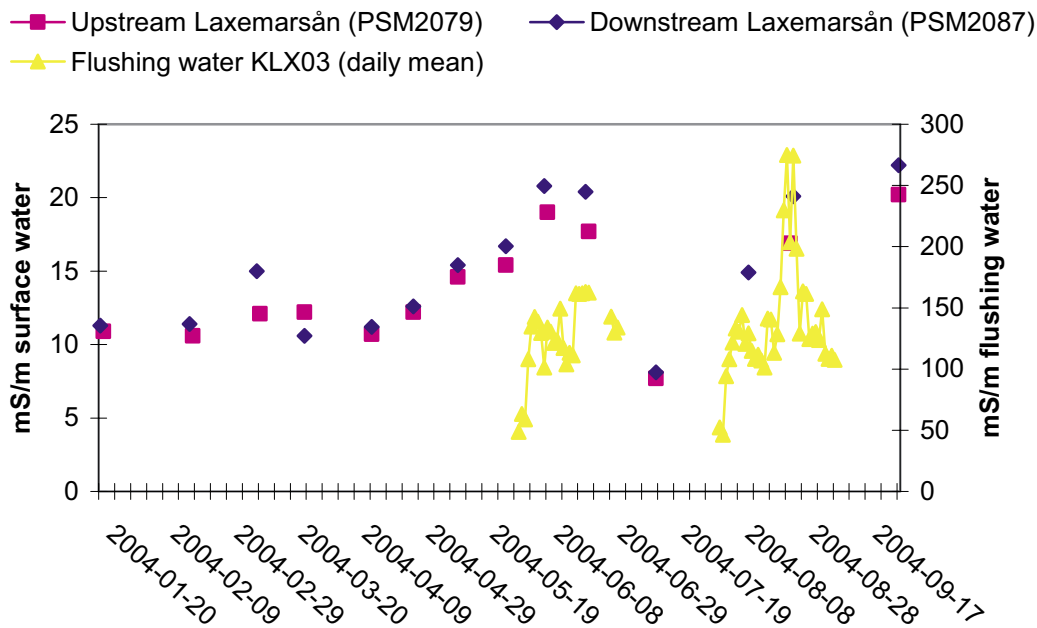


Figure 5-3. Conductivity in flushing water from KLX03 (values of daily mean) and in up- respectively downstream the borehole draining into in the stream Laxemarsån.

5.1.2 KLX04

Totally for the period approximately 4,000 m^3 of flushing water have been released to infiltrate the ground at the borehole KLX04. The accumulated flushing water volume is shown in Figure 5-4.

The flow of the flushing water is shown in comparison with the surface water stations in Figure 5-5.

KLX04

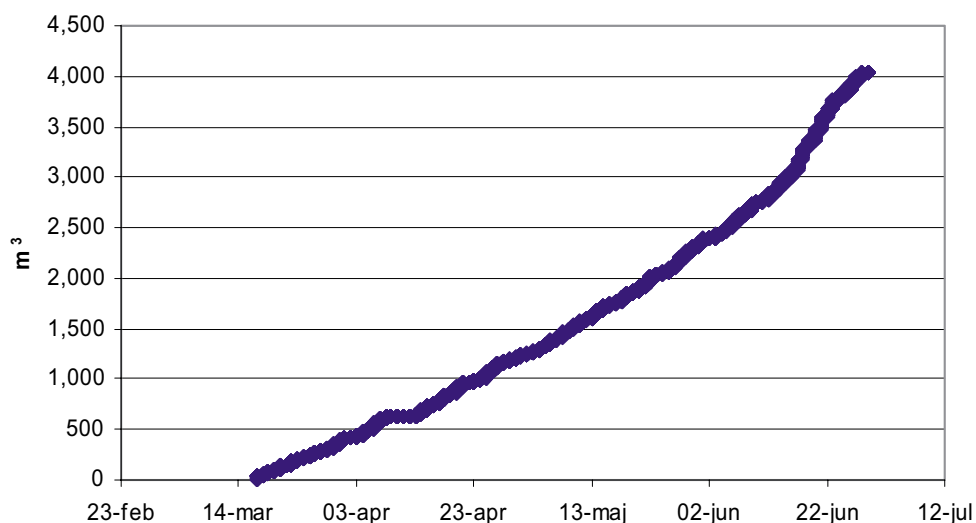


Figure 5-4. Accumulated volumes of flushing water from KLX04.

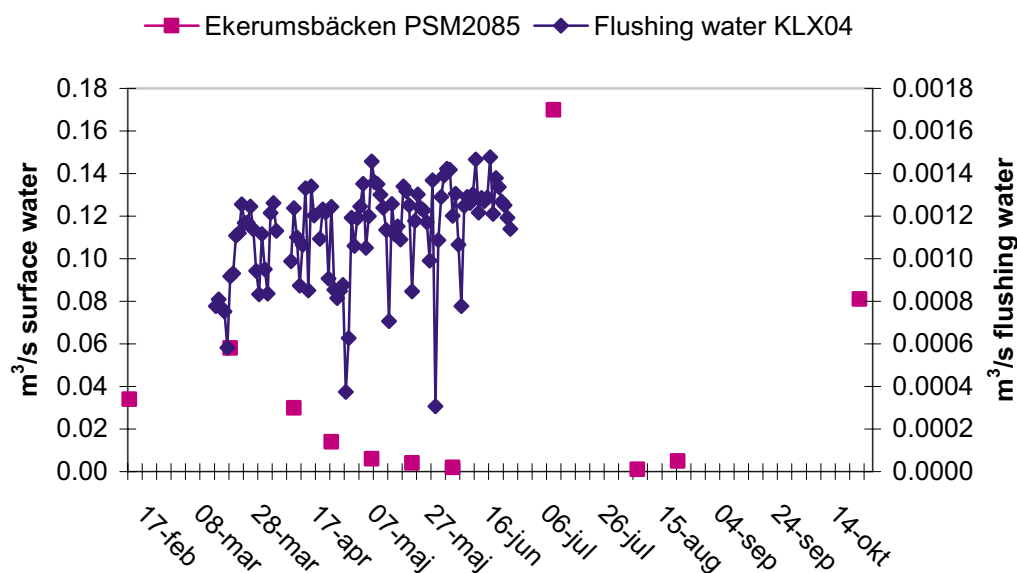


Figure 5-5. Water flow in m^3/s , in the stream water of the stream Ekerum, and of flushing water from KLX04.

The flow of flushing water varied between 2–60% of the flow in the surface water in Ekerumsbäcken.

Conductivity in flushing water and surface water in connection to KLX04 are shown in Figure 5-6. The figure clearly shows the effect of the ditch water on stream water; high conductivity in ditch water results in a higher (downstream) conductivity. There is a slight rise in conductivity during the boring period, but the rise is seen both up- and downstream and can thus not be connected to the release of flushing water. The low conductivity in July is probably due to the high flow and a corresponding precipitation.

Conductivity in the flushing water was during the whole release period beneath the limit of 300 mS/m.

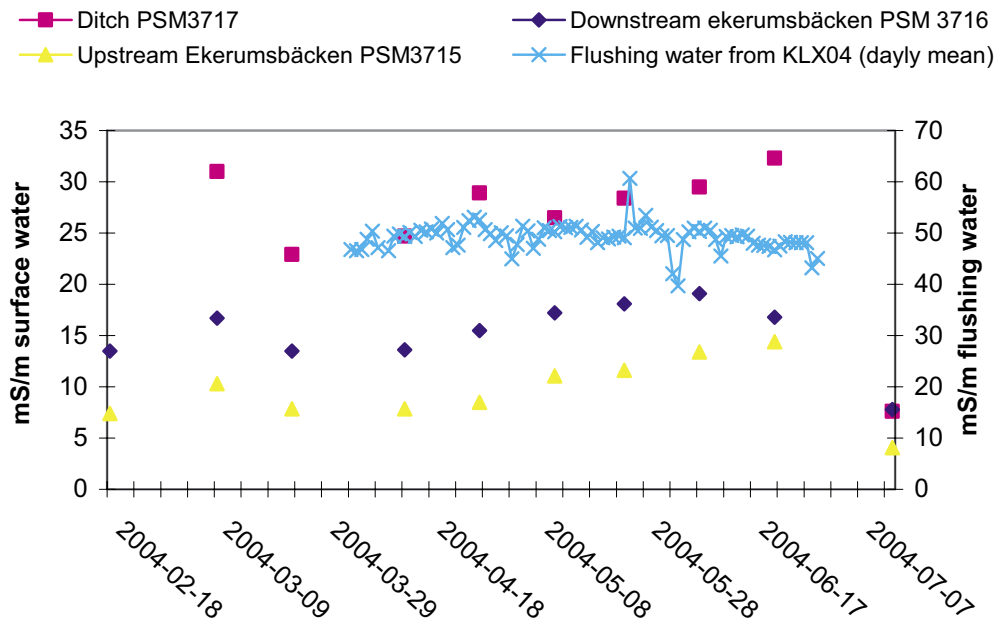


Figure 5-6. Conductivity in flushing water from KLX04, in drainage ditch and in up- respectively downstream the ditch drains in the stream Ekerumsbäcken.

5.1.3 Uranine in flushing water

The concentration of uranine in the flushing water has varied between 0.15 mg/l and 0.25 mg/l at both sites, with one exception: The first 200 m³ flushing water released from KLX04 had higher concentrations (up to 2 mg/l) due to technical problems.

5.2 Bottom fauna

Prior to the release of infiltrating flushing water, the following results regarding bottom fauna in the stream were reported. The substrate was dominated by sand and the vegetation was dominated by “floating leaf plants” and “above surface plants” at the two sampling locations (LSM269 and LSM270), se Figure 5-7 and 5-8.

At the upstream location (LSM269) 13 different taxa were found and at the downstream location (LSM270) 21 different taxa were found. Upstream the abundance was quite high, 2,838 individuals per square meter whereas downstream the abundance was very high, 7,070 individuals per square meter (Table 5-1). Upstream the dominating organism group was shredders and filter feeders whereas detritus feeders dominated abundance as well as the biomass downstream (Appendix 1).

After the release of infiltrating flushing water 20 different taxa were found at the upstream location and 28 different taxa were found at the downstream location (LSM270). Both upstream and downstream the abundance was very high, 15,368 and 6,014 individuals per square meter respectively (Table 5-2). Filter feeders were the dominating organism group upstream, whereas detritus feeders dominated both abundance and biomass downstream.

Upstream the species composition and biomass was dominated by filter feeders and downstream by detritus feeders (Appendix 1).



Figure 5-7. The upstream sampling location of Stream Ekerumsbäcken (LSM269) in March and June respectively.



Figure 5-8. The downstream sampling location of Stream Ekerumsbäcken (LSM270) in March and June respectively.

Table 5-1. Number of different taxa, abundance and biomass at the site in the stream Ekerumsbäcken, before and after release flushing water.

Before

Station number	Taxa (number)	Abundance (number/m²)	Biomass (g/m²)
LSM269	13	2,828	6.5
LSM270	21	7,070	22.4
LSM271	14	1,842	4.4

After

Station number	Taxa (number)	Abundance (number/m²)	Biomass (g/m²)
LSM269	20	15,386	41
LSM270	28	6,014	28
LSM271	–	–	–

6 Summary and discussion

Conductivity in shallow ground water in the site investigation area has been sampled since October 2002 and varies between 4 and 91 mS/m, with a mean conductivity of 37 mS/m.

Surface water in the area have been sampled during the site investigation and average conductivity in surface stream waters varies between 7 and 23 mS/m /Ericsson and Engdahl, 2004/.

The highest conductivity was measured in the ditch draining the flushing water from KLX04, which varied between 20 and 33 mS/m during the investigated period. This is above the range of mean conductivity in surface waters at the sampling locations in the site investigation area. However, in the ditch the measured values of conductivity sometimes exceeded 23 mS/m even before flushing water was released. The surface water conductivity is also still within the normal variation for shallow groundwater at the site and corresponds to approximately 50 mg/l of chloride /SEPA (Naturvårdsverket), 1999/, regarded as a moderate concentration.

Up- and downstream conductivity in the streams, seems to co-vary over time more, than conductivity in ditch water and in downstream stream water. This indicates that flow and precipitation has a stronger influence on the conductivity in the streams, than the addition of infiltrating flushing water.

The stream Ekerumsbäcken was inhabited by normal bottom fauna of its type. An increase in number of taxa, abundance and biomass can be seen following the release of flushing water. This is, however, a normal seasonal variation and is not likely to be associated with the release of flushing water.


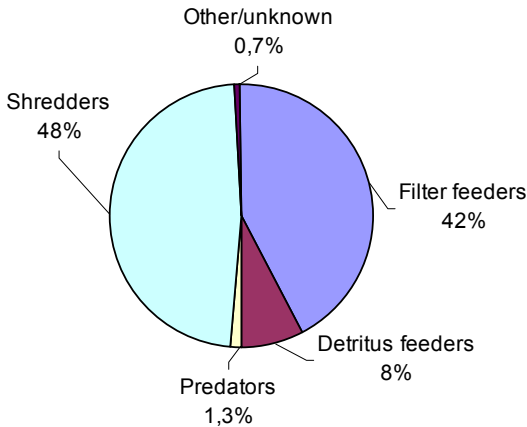
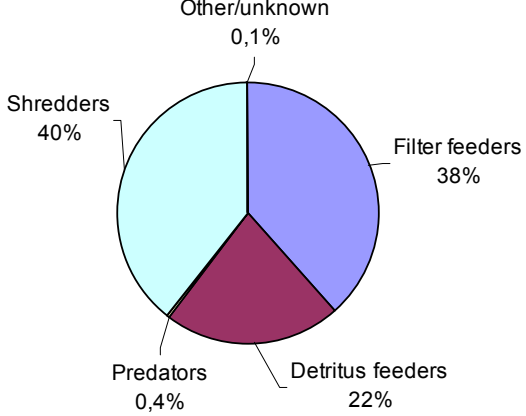
To sum up, there is no indication of rise in conductivity during the investigated period in the surface water other than within the range of earlier observed natural variation. Therefore there is no reason to believe that the ecosystem in the streams has been negatively affected.

References

Ericsson U, Engdahl A, 2004. Surface water sampling in Oskarshamn. SKB P-04-75. Svensk Kärnbränslehantering AB.

SEPA (Naturvårdsverket), 1999. Widerholm T, (ed) Bedömningsgrunder för miljö kvalitet, Grundvatten. Naturvårdsverket, Rapport 4915.

Results and protocols from Bottom fauna sampling

LSM000269. Ekerumsbäcken, upstream		Date:	2004-03-11
Main catch area: 72 Marströmmen/73 Virån		Co-ordinate:	6366874/1547741
 <p>37 m downstream the road</p>			
Classification			
Total number of taxa	13	very low	Diversity index: 1,79 very low
Aver. no. of taxa/sample	9,6	very low	ASPT index: 4,8 low
Abundance/sqm.	2 838	high	DSFI: 3 very low
Biomass (g/sqm)	6,5		Acidity index: 1 very low
EPT index:	6	very low	BottenpHauna index: 0
Classification of deviation from comparative value			
Diversity index:	evident	DSFI	high
ASPT index:	evident	Acidity index	very high
Abundance		Biomass	
			
Comments:			

LSM000269. Ekerumsbäcken, upstream

2004-03-11

Det. Alf Engdahl, Medins Sjö- och Åbiologi AB

Method: SS EN 27 828 + NV:s handbok för miljöövervakning



REPORT

utfärdad av ackrediterat laboratorium

REPORT issued by an Accredited Laboratory

SPECIES/TAXA	CATEGORY			Sample					Aver.	%
	Fk	Fg	Eg	1	2	3	4	5		
OLIGOCHAETA, fåborstmaskar										
Oligochaeta, oidentifierad	0	2	0	17	4	2	22	5	10,0	1,4
ISOPODA, gråsuggor										
Asellus aquaticus - (Linné, 1758)	1	2	2	79	30	44	31	33	43,4	6,1
PLECOPTERA, bäcksländor										
Nemoura cinerea - (Retzius, 1783)	1	5	3	354	224	198	470	330	315,2	44,4
TRICHOPTERA, nattsländor										
Glyptotaelius pellucidus - (Retzius, 1783)	1	5	2			1		1	0,4	0,1
Grammotaulius sp. (nigropunctatus-typ)	0	5	0			1	2	3	1,2	0,2
Limnephilidae	0	5	0	12	5	5	4	4	6,0	0,8
Limnephilus sp. (flavicornis-typ)	0	5	0			6	1	1	1,6	0,2
Limnephilus sp. (rhombicus-typ)	0	5	3	5	4	3	7	2	4,2	0,6
Limnephilus sp.	0	5	0	18	11	9	20	13	14,2	2,0
Trichostegia minor - (Curtis, 1834)	0	3	0	1		1	2		0,8	0,1
DIPTERA, tvåvingar										
Chironomidae (predators)	0	3	0	15		4	15	9	8,6	1,2
Chironomidae (unknown)	0	0	0	8	4	1	8	2	4,6	0,6
Cyclorrhapha	0	0	0					1	0,2	0,0
Simuliidae	1	1	0		1			4	1,0	0,1
BIVALVIA, musslor										
Pisidium sp.	1	1	0	385	123	62	510	410	298,0	42,0
SUM (number of individuals):				894	406	337	1092	818	709,4	100
SUM (number of taxa):				8	7	11	10	12	9,6	

Total number of taxa	13	Diversity index	1,79	Acidity index	1
Aver. numb. of taxa/sample	9,6	ASPT index	4,8	EPT index	6
Abundance/sqm.	2 838	DSFI	3		

Laboratorium ackrediteras av Styrelsen för ackreditering och teknisk kontroll (SWEDAC) enligt svensk lag. Den ackrediterade verksamheten vid laboratorierna uppfyller kraven i SS-EN ISO/IEC 17025 (2000). Denna rapport får endast återges i sin helhet, om inte utfärdande laboratorium i förväg godkänt annat.

LSM000269. Ekerumsbäcken, upstream

Water area

Lake/watershed:	<u>Ekerumsbäcken</u>	County:	<u>Kalmar</u>
Station number:	<u>LSM000269</u>	Municipality:	<u>Oskarshamn</u>
Station name:	<u>upstream</u>	Map number:	<u>6G SO</u>
Main catch. area:	<u>72 Marströmmen/73 Virån</u>	Co-ordinates:	<u>start: 6366874 / 1547741</u> <u>stop: 6366880/1547735</u>

Sampling

Date:	<u>2004-03-11</u>	Method:	<u>SS EN 27 828</u>
Name:	<u>Erik Wijnblad</u>	Sample size (m ²):	<u>0,25</u>
Organization:	<u>SKB</u>	No. of samples:	<u>5</u>
Purpose:	<u>control of effects</u>	Chem. sampl:	<u>no</u>

Station

Length:	<u>10 m</u>	Water velocity:	<u>slow (<0,2 m/s)</u>
Width (wet surface):	<u>1,4 m</u>	Turbidity:	<u>clear</u>
Width (normal surface):	<u>1 m</u>	Colour:	<u>clear</u>
Water level:	<u>low</u>	Water temp:	<u>0,5 °C</u>
Average depth:	<u>0,26 m</u>	Trophic level:	<u>eutrohic</u>
Maximum depth:	<u>0,31 m</u>		
Site description:	<u>37 m downstream the road</u>		

Bottom substrate and water vegetation (dominating type and grade of covering)

Inorganic mtrl, dom. 1:	<u>sand</u>	Vegetation type, dom. 1:	<u>Float. leaf plants:</u>
Inorganic mtrl, dom. 2:	<u>-</u>	Vegetation type, dom. 2:	<u>Above surf. plants:</u>
Inorganic mtrl, dom. 3:	<u>-</u>	Vegetation type, dom. 3:	<u>-</u>

Clay:	<u>>50%</u>	Above surf. plants:	<u>5-50%</u>	Fine detritus:	<u>5-50%</u>
Sand:	<u>5-50%</u>	Float. leaf plants:	<u>> 50%</u>	Large detritus:	<u>5-50%</u>
Gravel:	<u>missing</u>	Long shoot plants:	<u>missing</u>	Fine dead wood:	<u>missing</u>
Small stones:	<u>missing</u>	Rosette plants:	<u>missing</u>	Large dead wood:	<u>missing</u>
Large stones:	<u>missing</u>	Mosses:	<u><5 %</u>		
Small boulders:	<u>missing</u>	Periphyton:	<u>missing</u>		
Large boulders:	<u>missing</u>				
Flat rock:	<u>missing</u>				

Immediate surroundings 0-30 m (Dominating types)

Dominating 1:	<u>field</u>	Dominating 2:	<u>-</u>	Dominating 3:	<u>-</u>
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Bank description 0-5 m

Vegetation type	Dom. species:	Sub.dom. species:
Dominating 1:	<u>grass</u>	<u>-</u>
Dominating 2:	<u>-</u>	<u>-</u>
Dominating 3:	<u>-</u>	<u>-</u>
Shading:	<u>missing</u>	

Influence

Type:	Strength:
A: <u>Agriculture</u>	<u>very high</u>
B: <u>-</u>	<u>-</u>
C: <u>-</u>	<u>-</u>

Miscellaneous

The substrate quality was not suitable for the kick sample method. Samples were taken by drawing the handnet through vegetation. Sampling was completed with a qualitative sample. The edges were ice-covered.

LSM000269. Ekerumsbäcken, upstream

Date: 2004-06-23

Main catch area: 72 Marströmmen/73 Virån

Co-ordinate: 6366874/1547741



27 m downstream the road

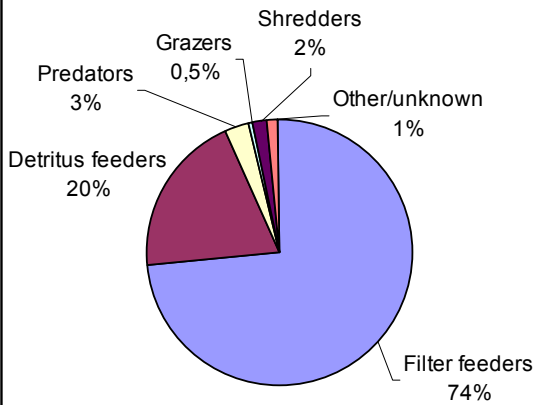
Classification

Total number of taxa	20	low	Diversity index:	1,42	very low
Aver. no. of taxa/sample	11,4	low	ASPT index:	4,2	very low
Abundance/sqm.	15 386	very high	DSFI	3	very low
Biomass (g/sqm)	41,0		Acidity index	4	low
EPT index:	2	very low	BottenpHauna index:	0	

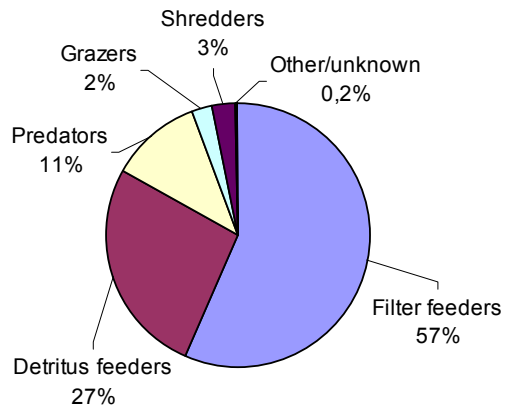
Classification of deviation from comparative value

Diversity index:	high	DSFI	high
ASPT index:	evident	Acidity index	evident

Abundance



Biomass



Comments:

LSM000269. Ekerumsbäcken, upstream

2004-06-23

Det. Alf Engdahl, Medins Sjö- och Åbiologi AB

Method: SS EN 27 828 (mod.) + NV:s handbok för miljöövervakning



REPORT

utfärdad av ackrediterat laboratorium
REPORT issued by an Accredited Laboratory

SPECIES/TAXA	CATEGORY			Sample					Aver.	%
	Fk	Fg	Eg	1	2	3	4	5		
HYDROZOA, hydror										
Hydridae	4	1	0	1	2				0,6	0,0
TURBELLARIA, virvelmaskar										
Planariidae(Planaria /Dugesia-gruppen)	3	3	0		1				0,2	0,0
Polycelis sp.	1	3	0		1	2	3	1	1,4	0,1
OLIGOCHAETA, fåborstmaskar										
Oligochaeta, oidentifierad	0	2	0	13			1	18	6,4	0,4
HIRUDINEA, iglar										
Erpobdella sp.	0	3	2				1	2	0,6	0,0
Haemopsis sanguisuga - (Linné, 1758)	0	3	0		1				0,2	0,0
ISOPODA, gråsuggor										
Asellus aquaticus - (Linné, 1758)	1	2	2	82	170	54	62	234	120,4	7,8
HYDRACARINA, sötvattenskvalster										
Hydracarina, oidentifierad	0	3	0			2		3	1,0	0,1
ARANEA, spindlar										
Argyroneta aquatica - (Clerck, 1757)	0	3	0					1	0,2	0,0
PLECOPTERA, bäcksländor										
Nemoura cinerea - (Retzius, 1783)	1	5	3	27	33	26	18	27	26,2	1,7
MEGALOPTERA, sävsländor										
Sialis sp.	0	3	0			1			0,2	0,0
TRICHOPTERA, nattsländor										
Oligostomis reticulata - (Linné, 1761)	2	4	3	8	14	5	1	7	7,0	0,5
HEMIPTERA, skinnbaggar										
Gerris lacustris - (Linné, 1758)	1	3	0	1					0,2	0,0
COLEOPTERA, skalbaggar										
Dytiscus sp.	0	3	0		1	1			0,4	0,0
Hydrophilidae	0	0	0			1			0,2	0,0
DIPTERA, tvåvingar										
Chironomidae (other/unknown)	0	0	0	14	60	10		20	20,8	1,4
Chironomidae (predators)	0	3	0	7	50	60	50	60	45,4	3,0
Chironomidae (detritus feeders)	0	2	0	4	90	180	480	135	177,8	11,6
GASTROPODA, snäckor										
Radix labiata - (Rossmässler, 1835)	3	4	3				1	1	0,4	0,0
BIVALVIA, musslor										
Pisidium sp.**	1	1	0	275	1110	2250	1200	810	1129,0	73,4
SUM (number of individuals):				432	1533	2592	1817	1319	1538,6	100
SUM (number of taxa):				10	12	12	10	13	11,4	

Total number of taxa	20	Diversity index	1,42	Acidity index	4
Aver. numb. of taxa/sample	11,4	ASPT index	4,2	EPT index	2
Abundance/sqm.	15 386	DSFI	3		

Laboratorium ackrediteras av Styrelsen för ackreditering och teknisk kontroll (SWEDAC) enligt svensk lag. Den ackrediterade verksamheten vid laboratorierna uppfyller kraven i SS-EN ISO/IEC 17025 (2000). Denna rapport får endast återges i sin helhet, om inte utfärdande laboratorium i förväg godkänt annat.

LSM000269. Ekerumsbäcken, upstream			
Water area			
Lake/watershed:	<u>Ekerumsbäcken</u>	County:	<u>Kalmar</u>
Station number:	<u>LSM000269</u>	Municipality:	<u>Oskarshamn</u>
Station name:	<u>upstream</u>	Map number:	<u>6G SO</u>
Main catch. area:	<u>72 Marströmmen/73 Virån</u>	Co-ordinates:	<u>start: 6366874 / 1547741</u> <u>stop: 6366880/1547735</u>
Sampling			
Date:	<u>2004-06-23</u>	Method:	<u>SS EN 27 828 (mod.)</u>
Name:	<u>E Wijnbladh/A Engdahl</u>	Sample size (m ²):	<u>0,1</u>
Organization:	<u>SKB</u>	No. of samples:	<u>5</u>
Purpose:	<u>control of effects</u>	Chem. sampl:	<u>no</u>
Station			
Length:	<u>10 m</u>	Water velocity:	<u>slow (<0,2 m/s)</u>
Width (wet surface):	<u>1 m</u>	Turbidity:	<u>turbid</u>
Width (normal surface):	<u>1 m</u>	Colour:	<u>coloured</u>
Water level:	<u>moderately high</u>	Water temp:	<u>9,9 °C</u>
Average depth:	<u>0,11 m</u>	Trophic level:	<u>eutrophic</u>
Maximum depth:	<u>0,14 m</u>		
Site description:	<u>27 m downstream the road</u>		
Bottom substrate and water vegetation (dominating type and grade of covering)			
Inorganic mtrl, dom. 1:	<u>-</u>	Vegetation type, dom. 1:	<u>Above surf. plants:</u>
Inorganic mtrl, dom. 2:	<u>-</u>	Vegetation type, dom. 2:	<u>Float. leaf plants:</u>
Inorganic mtrl, dom. 3:	<u>-</u>	Vegetation type, dom. 3:	<u>-</u>
Clay:	<u><5%</u>	Above surf. plants:	<u>> 50%</u>
Sand:	<u>missing</u>	Float. leaf plants:	<u><5 %</u>
Gravel:	<u>missing</u>	Long shoot plants:	<u>missing</u>
Small stones:	<u>missing</u>	Rosette plants:	<u>missing</u>
Large stones:	<u>missing</u>	Mosses:	<u>missing</u>
Small boulders:	<u>missing</u>	Periphyton:	<u><5 %</u>
Large boulders:	<u>missing</u>		
Flat rock:	<u>missing</u>		
		Fine detritus:	<u>5-50%</u>
		Large detritus:	<u>5-50%</u>
		Fine dead wood:	<u><5%</u>
		Large dead wood:	<u>missing</u>
Immediate surroundings 0-30 m (Dominating types)			
Dominating 1:	<u>field</u>	Dominating 2:	<u>-</u>
		Dominating 3:	<u>-</u>
Bank description 0-5 m			
Vegetation type	<u>herbs/grass</u>	Dom. species:	<u>Ranunculus</u>
Sub.dom. species:	<u>Chamomilla</u>		
Dominating 1:	<u>herbs/grass</u>		
Dominating 2:	<u>-</u>		
Dominating 3:	<u>-</u>		
Shading:	<u>missing</u>		
Influence			
Type:	<u>Agriculture</u>	Strength:	<u>very high</u>
A:	<u>Agriculture</u>		
B:	<u>-</u>		
C:	<u>-</u>		
Miscellaneous			
The substrate quality was not suitable for the kick sample method. Samples were taken by drawing the handnet through vegetation. Sampling was completed with a qualitative sample.			

LSM000270. Ekerumsbäcken, downstream

Date: 2004-03-10

Main catch area: 72 Marströmmen/73 Virån

Co-ordinate: 636675/1548180



15-25 m downstream the tributary stream

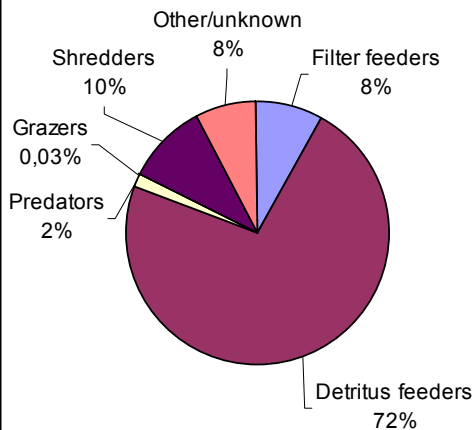
Classification

Total number of taxa	21	low	Diversity index:	1,57	very low
Aver. no. of taxa/sample	12,4	low	ASPT index:	4,7	low
Abundance/sqm.	7 070	very high	DSFI	3	very low
Biomass (g/sqm)	22,43		Acidity index	2	very low
EPT index:	7	very low	BottenpHauna index:	10	

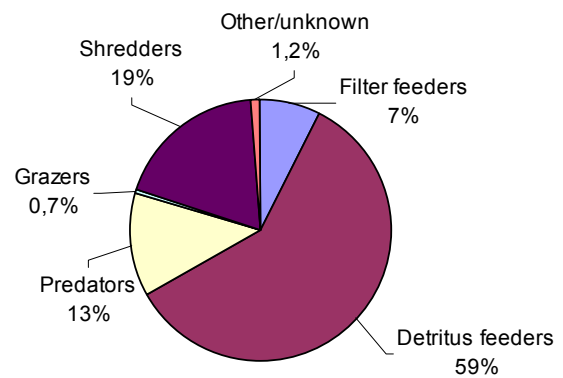
Classification of deviation from comparative value

Diversity index:	high	DSFI	high
ASPT index:	evident	Acidity index	high

Abundance



Biomass



Comments:

LSM000270. Ekerumsbäcken, downstream

2004-03-10

Det. Alf Engdahl, Medins Sjö- och Åbiologi AB

Method: SS EN 27 828 + NV:s handbok för miljöövervakning



REPORT

utfärdad av ackrediterat laboratorium

REPORT issued by an Accredited Laboratory

SPECIES/TAXA	CATEGORY			Sample					Aver.	%
	Fk	Fg	Eg	1	2	3	4	5		
TURBELLARIA, virvelmaskar										
Dendrocoelum lacteum - (O. F. Müller, 1774)	3	3	0	2		1	4	3	2,0	0,1
Polycelis sp.	1	3	0	55	22	4	25	20	25,2	1,4
OLIGOCHAETA, fåborstmaskar										
Oligochaeta, oidentifierad	0	2	0			2			0,4	0,0
ISOPODA, gråsuggor										
Asellus aquaticus - (Linné, 1758)	1	2	2	375	2160	860	1350	1620	1273,0	72,0
ODONATA, trollsländor										
Pyrrhosoma nymphula - (Sulzer, 1776)	1	3	3		1				0,2	0,0
EPHEMEROPTERA, dagsländor										
Cloeon sp.	0	4	3		1				0,2	0,0
Leptophlebia marginata - (Linné, 1767)	1	2	3	1			3		0,8	0,0
PLECOPTERA, bäcksländor										
Nemoura cinerea - (Retzius, 1783)	1	5	3	158	84	162	234	108	149,2	8,4
MEGALOPTERA, sävsländor										
Sialis sp. (lutaria gr.)	1	3	2		2	2		1	1,0	0,1
TRICHOPTERA, nattsländor										
Glyptotaelius pellucidus - (Retzius, 1783)	1	5	2			2	2	2	1,2	0,1
Grammotaulius sp. (nigropunctatus-typ)	0	5	0			4		5	1,8	0,1
Limnephilidae	0	5	0	2	11	3	2	6	4,8	0,3
Limnephilus sp. (flavicornis-typ)	0	5	0	3	16	8	7	17	10,2	0,6
Limnephilus sp. (rhombicus-typ)	0	5	3				2	3	1,0	0,1
Limnephilus sp.	0	5	0	2	35	5	3	17	12,4	0,7
COLEOPTERA, skalbaggar										
Agabus sp.	0	3	0		1	1	1		0,6	0,0
Dytiscus marginalis - Linné, 1758	0	3	3					1	0,2	0,0
Hydroporus sp.	1	3	3		1				0,2	0,0
Ilybius sp.	2	3	0			4	5		1,8	0,1
DIPTERA, tvåvingar										
Chironomidae	0	0	0	41	375	48	99	104	133,4	7,5
Simuliidae	1	1	0	2	27	38	6	114	37,4	2,1
GASTROPODA, snäckor										
Radix labiata - (Rossmässler, 1835)	3	4	3					2	0,4	0,0
BIVALVIA, musslor										
Pisidium sp.	1	1	0	5	240	65	24	216	110,0	6,2
SUM (number of individuals):				646	2976	1209	1767	2239	1767,4	100
SUM (number of taxa):				9	12	14	13	14	12,4	

Total number of taxa	21	Diversity index	1,57	Acidity index	2
Aver. numb. of taxa/sample	12,4	ASPT index	4,7	EPT index	7
Abundance/sqm.	7 070	DSFI	3		

Laboratorium ackrediteras av Styrelsen för ackreditering och teknisk kontroll (SWEDAC) enligt svensk lag. Den ackrediterade verksamheten vid laboratorerna uppfyller kraven i SS-EN ISO/IEC 17025 (2000). Denna rapport får endast återges i sin helhet, om inte utfärdande laboratorium i förväg godkänt annat.

LSM000270. Ekerumsbäcken, downstream

Water area

Lake/watershed:	<u>Ekerumsbäcken</u>	County:	<u>Kalmar</u>
Station number:	<u>LSM000270</u>	Municipality:	<u>Oskarshamn</u>
Station name:	<u>downstream</u>	Map number:	<u>6G SO</u>
Main catch. area:	<u>72 Marströmmen/73 Virån</u>	Co-ordinates:	<u>start: 6366675 / 1548180</u> <u>stop: 6366680/1548170</u>

Sampling

Date:	<u>2004-03-10</u>	Method:	<u>SS EN 27 828</u>
Name:	<u>Alf Engdahl</u>	Sample size (m ²):	<u>0,25</u>
Organization:	<u>Medins</u>	No. of samples:	<u>5</u>
Purpose:	<u>control of effects</u>	Chem. sampl:	<u>yes</u>

Station

Length:	<u>10 m</u>	Water velocity:	<u>slow (<0,2 m/s)</u>
Width (wet surface):	<u>2,1 m</u>	Turbidity:	<u>clear</u>
Width (normal surface):	<u>2,1 m</u>	Colour:	<u>clear</u>
Water level:	<u>moderately high</u>	Water temp:	<u>1 °C</u>
Average depth:	<u>0,2 m</u>	Trophic level:	<u>eutrohic</u>
Maximum depth:	<u>0,3 m</u>		
Site description:	<u>15-25 m downstream the tributary stream</u>		

Bottom substrate and water vegetation (dominating type and grade of covering)

Inorganic mtrl, dom. 1:	<u>-</u>	Vegetation type, dom. 1:	<u>Float. leaf plants:</u>
Inorganic mtrl, dom. 2:	<u>-</u>	Vegetation type, dom. 2:	<u>Above surf. plants:</u>
Inorganic mtrl, dom. 3:	<u>-</u>	Vegetation type, dom. 3:	<u>Rosette plants:</u>

Clay:	<u>missing</u>	Above surf. plants:	<u>5-50%</u>	Fine detritus:	<u><5%</u>
Sand:	<u>missing</u>	Float. leaf plants:	<u>> 50%</u>	Large detritus:	<u><5%</u>
Gravel:	<u>missing</u>	Long shoot plants:	<u>missing</u>	Fine dead wood:	<u>missing</u>
Small stones:	<u>missing</u>	Rosette plants:	<u>5-50%</u>	Large dead wood:	<u>missing</u>
Large stones:	<u>missing</u>	Mosses:	<u>missing</u>		
Small boulders:	<u>missing</u>	Periphyton:	<u>missing</u>		
Large boulders:	<u>missing</u>				
Flat rock:	<u>missing</u>				

Immediate surroundings 0-30 m (Dominating types)

Dominating 1:	<u>field</u>	Dominating 2:	<u>-</u>	Dominating 3:	<u>-</u>
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Bank description 0-5 m

	Vegetation type	Dom. species:	Sub.dom. species:
Dominating 1:	<u>grass</u>	<u>-</u>	<u>-</u>
Dominating 2:	<u>-</u>	<u>-</u>	<u>-</u>
Dominating 3:	<u>-</u>	<u>-</u>	<u>-</u>
Shading:	<u>missing</u>		

Influence

	Type:	Strength:
A:	<u>Agriculture</u>	<u>very high</u>
B:	<u>-</u>	<u>-</u>
C:	<u>-</u>	<u>-</u>

Miscellaneous

The substrate quality was not suitable for the kick sample method. Samples were taken by drawing the handnet through vegetation. Sampling was completed with a qualitative sample.

LSM000270. Ekerumsbäcken, downstream

Date: 2004-06-23

Main catch area: 72 Marströmmen/73 Virån

Co-ordinate: 6366675/1548180



5-15 m downstream the tributary stream

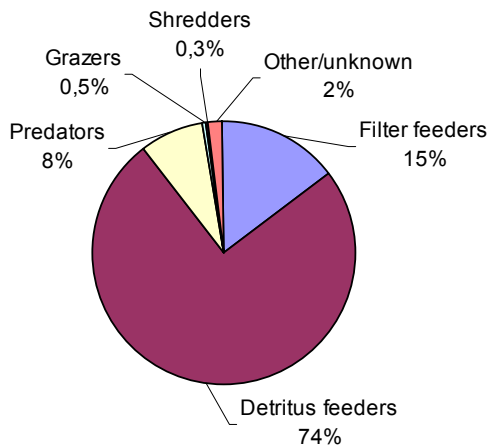
Classification

Total number of taxa	28	moderately high	Diversity index:	1,73	very low
Aver. no. of taxa/sample	15,8	moderately high	ASPT index:	4,6	low
Abundance/sqm.	6 014	very high	DSFI	3	very low
Biomass (g/sqm)	28,1		Acidity index	5	moderately high
EPT index:	3	very low	BottenpHauna index:	10	

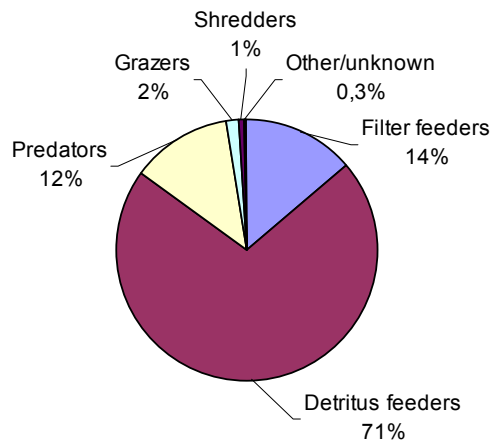
Classification of deviation from comparative value

Diversity index:	high	DSFI	high
ASPT index:	evident	Acidity index	moderately high

Abundance



Biomass



Comments:

LSM000270. Ekerumsbäcken, downstream

2004-06-23

Det. Alf Engdahl, Medins Sjö- och Åbiologi AB

Method: SS EN 27 828 (mod) + NV:s handbok för miljöövervakning



REPORT

utfärdad av ackrediterat laboratorium
REPORT issued by an Accredited Laboratory

SPECIES/TAXA	CATEGORY			Sample					Aver.	%
	Fk	Fg	Eg	1	2	3	4	5		
TURBELLARIA, virvelmaskar										
Dendrocoelum lacteum - (O. F. Müller, 1774)	3	3	0				3	4	1,4	0,2
Planariidae(Planaria /Dugesia-gruppen)	3	3	0					2	0,4	0,1
Polycelis sp.	1	3	0		1		7		1,6	0,3
OLIGOCHAETA, fåborstmaskar										
Oligochaeta, oidentifierad	0	2	0	7	2	3	1	7	4,0	0,7
HIRUDINEA, iglar										
Erpobdella lineata - (Müller, 1774)	0	3	2			1		1	0,4	0,1
Erpobdella sp.	0	3	2	1	2	1		1	1,0	0,2
Erpobdella testacea - (Savigny, 1822)	3	3	2		1		1		0,4	0,1
ISOPODA, gråsguggor										
Asellus aquaticus - (Linné, 1758)	1	2	2	290	355	138	810	440	406,6	67,6
HYDRACARINA, sötvattens kvalster										
Hydracarina, oidentifierad	0	3	0	2	1		3	1	1,4	0,2
ARANEA, spindlar										
Argyroneta aquatica - (Clerck, 1757)	0	3	0				1	1	0,4	0,1
ODONATA, trollsländor										
Cordulia aenae - (Linné, 1758)	2	3	0				1		0,2	0,0
EPHEMEROPTERA, dagsländor										
Cloeon sp. (dipterum gr.)	0	4	3	2	1		1	4	1,6	0,3
MEGALOPTERA, sävsländor										
Sialis sp. (lutaria gr.)	1	3	2	4		1	3	3	2,2	0,4
TRICHOPTERA, nattsländor										
Limnephilidae	0	0	0				1		0,2	0,0
Limnephilus sp. (rhombicus-typ)*	0	5	3							
Limnephilus sp.	0	5	0	3	3		2		1,6	0,3
Oligostomis reticulata - (Linné, 1761)	2	4	3		4				0,8	0,1
HEMIPTERA, skinnbaggar										
Corixidae	0	2	0		2		5	11	3,6	0,6
Hesperocorixa sahlbergi - (Fieber, 1848)	2	2	0			1			0,2	0,0
Notonecta glauca - Linné, 1758	2	3	0	1					0,2	0,0
COLEOPTERA, skalbaggar										
Dytiscus sp.	0	3	0					1	0,2	0,0
Hydaticus seminiger - (De Geer, 1774)	0	3	0					1	0,2	0,0
Hydaticus sp.	0	3	0	4			1		1,0	0,2
Hydaticus transversalis - (Pontoppidan, 1763)	0	3	0					1	0,2	0,0
Hydrophilidae	0	0	0	1		1			0,4	0,1
Hydroporus sp.	1	3	3			1	1	1	0,6	0,1
Hyphydrus ovatus - (Linné, 1761)	2	3	2				1		0,2	0,0
DIPTERA, tvåvingar										
Chironomidae (other/unknown)	0	0	0	6	6		20	12	8,8	1,5
Chironomidae (predators)	0	3	0	63	25	30	30	39	37,4	6,2
Chironomidae (detritus feeders)	0	2	0	72	6	28	24	36	33,2	5,5
GASTROPODA, snäckor										
Galba truncatula - (O. F. Müller, 1774)	0	4	0					1	0,2	0,0
Radix balthica/labiata	3	4	0	1	1	1			0,6	0,1
BIVALVIA, musslor										
Pisidium sp.	1	1	0	111	43	22	185	90	90,2	15,0
SUM (number of individuals):				568	453	229	1100	657	601,4	100
SUM (number of taxa):				15	14	12	19	19	15,8	

Total number of taxa	28	Diversity index	1,73	Acidity index	5
Aver. numb. of taxa/sample	15,8	ASPT index	4,6	EPT index	3
Abundance/sqm.	6 014	DSFI	3		

Laboratorium ackrediteras av Styrelsen för ackreditering och teknisk kontroll (SWEDAC) enligt svensk lag. Den ackrediterade verksamheten vid laboratorierna uppfyller kraven i SS-EN ISO/IEC 17025 (2000). Denna rapport får endast återges i sin helhet, om inte utfärdande laboratorium i förväg godkänt annat.

LSM000270. Ekerumsbäcken, downstream			
Water area			
Lake/watershed:	<u>Ekerumsbäcken</u>	County:	<u>Kalmar</u>
Station number:	<u>LSM000270</u>	Municipality:	<u>Oskarshamn</u>
Station name:	<u>downstream</u>	Map number:	<u>6G SO</u>
Main catch. area:	<u>72 Marströmmen/73 Virån</u>	Co-ordinates:	<u>start: 6366675 / 1548180</u> <u>stop: 6366680/1548170</u>
Sampling			
Date:	<u>2004-06-23</u>	Method:	<u>SS EN 27 828 (mod)</u>
Name:	<u>Alf Engdahl</u>	Sample size (m ²):	<u>0,1</u>
Organization:	<u>Medins</u>	No. of samples:	<u>5</u>
Purpose:	<u>control of effects</u>	Chem. sampl:	<u>no</u>
Station			
Length:	<u>10 m</u>	Water velocity:	<u>lugnt (< 0,2 m/s)</u>
Width (wet surface):	<u>1,8 m</u>	Turbidity:	<u>grumligt</u>
Width (normal surface):	<u>1,8 m</u>	Colour:	<u>färgat</u>
Water level:	<u>moderately high</u>	Water temp:	<u>10,9 °C</u>
Average depth:	<u>0,16 m</u>	Trophic level:	<u>eutrof</u>
Maximum depth:	<u>0,22 m</u>		
Site description:	<u>5-15 m downstream the tributary stream</u>		
Bottom substrate and water vegetation (dominating type and grade of covering)			
Inorganic mtrl, dom. 1:	<u>-</u>	Vegetation type, dom. 1:	<u>Above surf. plants:</u>
Inorganic mtrl, dom. 2:	<u>-</u>	Vegetation type, dom. 2:	<u>Float. leaf plants:</u>
Inorganic mtrl, dom. 3:	<u>-</u>	Vegetation type, dom. 3:	<u>-</u>
Clay:	<u><5%</u>	Above surf. plants:	<u>> 50%</u>
Sand:	<u>missing</u>	Float. leaf plants:	<u><5 %</u>
Gravel:	<u>missing</u>	Long shoot plants:	<u>missing</u>
Small stones:	<u>missing</u>	Rosette plants:	<u>missing</u>
Large stones:	<u>missing</u>	Mosses:	<u>missing</u>
Small boulders:	<u>missing</u>	Periphyton:	<u><5 %</u>
Large boulders:	<u>missing</u>		
Flat rock:	<u>missing</u>		
Immediate surroundings 0-30 m (Dominating types)			
Dominating 1:	<u>field</u>	Dominating 2:	<u>-</u>
		Dominating 3:	<u>-</u>
Bank description 0-5 m			
	Vegetation type	Dom. species:	Sub.dom. species:
Dominating 1:	<u>herbs/grass</u>	<u>Ranunculus</u>	<u>-</u>
Dominating 2:	<u>-</u>	<u>-</u>	<u>-</u>
Dominating 3:	<u>-</u>	<u>-</u>	<u>-</u>
Shading:	<u>missing</u>		
Influence			
	Type:	Strength:	
A:	<u>Agriculture</u>	<u>very high</u>	
B:	<u>-</u>	<u>-</u>	
C:	<u>-</u>	<u>-</u>	
Miscellaneous			
The substrate quality was not suitable for the kick sample method. Samples were taken by drawing the handnet through vegetation. Sampling was completed with a qualitative sample.			

LSM000271. Ekerumsbäcken, kempunkten

Date: 2004-02-19

Main catch area: 72 Marströmmen/73 Virån

Co-ordinate: 636654/154972



Approximately 150 m upstream the road

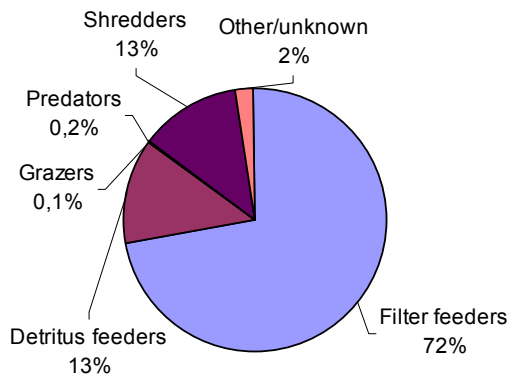
Classification

Total number of taxa	14	very low	Diversity index:	1,46	very low
Aver. no. of taxa/sample	8,6	very low	ASPT index:	5,0	low
Abundance/sqm.	1 842	high	DSFI	3	very low
Biomass (g/sqm)	4,38		Acidity index	1	very low
EPT index:	7	very low	BottenpHauna index:	0	

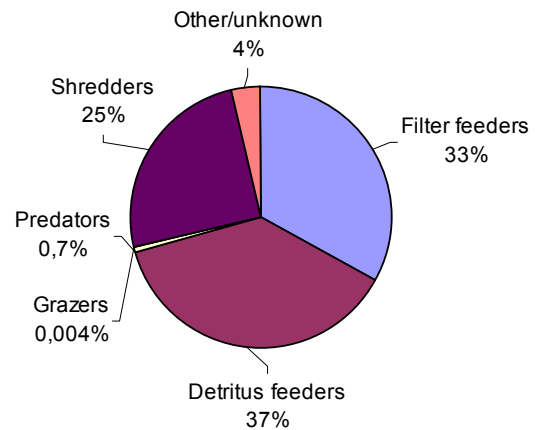
Classification of deviation from comparative value

Diversity index:	high	DSFI	high
ASPT index:	moderately high	Acidity index	very high

Abundance



Biomass



Comments:

LSM000271. Ekerumsbäcken, kemipunkten

2004-02-19

Det. Alf Engdahl, Medins Sjö- och Åbiologi AB

Method: SS EN 27 828 + NV/s handbok för miljöövervakning



REPORT

utfärdad av ackrediterat laboratorium
REPORT issued by an Accredited Laboratory

SPECIES/TAXA	CATEGORY			Sample					Aver.	%
	Fk	Fg	Eg	1	2	3	4	5		
OLIGOCHAETA, fåborstmaskar										
Oligochaeta, oidentifierad	0	2	0	2		7	2	1	2,4	0,5
ISOPODA, gråsuggor										
Asellus aquaticus - (Linné, 1758)	1	2	2	60	74	26	55	61	55,2	12,0
EPHEMEROPTERA, dagsländor										
Leptophlebia marginata - (Linné, 1767)	1	2	3	1					0,2	0,0
Leptophlebia vespertina - (Linné, 1758)	1	2	3	1					0,2	0,0
Leptophlebia sp.	1	2	3	4			3	2	1,8	0,4
PLECOPTERA, bäcksländor										
Amphinemura sp.	0	4	4	1	1				0,4	0,1
Nemoura cinerea - (Retzius, 1783)	1	5	3	44	60	33	65	26	45,6	9,9
Nemoura sp.	0	5	0	9	12	6	9	9	9,0	2,0
TRICHOPTERA, nattsländor										
Limnephilus sp.	0	5	0	1					0,2	0,0
Micropterna sequax - Mc Lachlan, 1875	0	5	0	5	1	6		3	3,0	0,7
Plectrocnemia conspersa - (Curtis, 1834)	1	3	3					2	0,4	0,1
Polycentropodidae	0	3	0		1				0,2	0,0
COLEOPTERA, skalbaggar										
Ilybius sp.	2	3	0					1	0,2	0,0
DIPTERA, tvåvingar										
Chironomidae	0	0	0	6	11	6	8	10	8,2	1,8
Limoniidae	0	0	0	4	2	2			1,6	0,3
Simuliidae	1	1	0	335	750	180	167	224	331,2	71,9
BIVALVIA, musslor										
Pisidium sp.	1	1	0			3	1		0,8	0,2
SUM (number of individuals):				473	912	269	310	339	460,6	100
SUM (number of taxa):				11	8	8	7	9	8,6	

Total number of taxa	14	Diversity index	1,46	Acidity index	1
Aver. numb. of taxa/sample	8,6	ASPT index	5,0	EPT index	7
Abundance/sqm.	1 842	DSFI	3		

Laboratorium ackrediteras av Styrelsen för ackreditering och teknisk kontroll (SWEDAC) enligt svensk lag. Den ackrediterade verksamheten vid laboratorierna uppfyller kraven i SS-EN ISO/IEC 17025 (2000). Denna rapport får endast återges i sin helhet, om inte utfärdande laboratorium i förväg godkänt annat.

LSM000271. Ekerumsbäcken, kemipunkten

Water area

Lake/watershed:	<u>Ekerumsbäcken</u>	County:	<u>Kalmar</u>
Station number:	<u>LSM000271</u>	Municipality:	<u>Oskarshamn</u>
Station name:	<u>kemipunkten</u>	Map number:	<u>6G SO</u>
Main catch. area:	<u>72 Marströmmen/73 Virån</u>	Co-ordinates:	<u>start: 6366540 / 1549720</u> <u>stop: 6366535/1549715</u>

Sampling

Date:	<u>2004-02-19</u>	Method:	<u>SS EN 27 828</u>
Name:	<u>Alf Engdahl</u>	Sample size (m ²):	<u>0,25</u>
Organization:	<u>Medins</u>	No. of samples:	<u>5</u>
Purpose:	<u>control of effects</u>	Chem. sampl:	<u>no</u>

Station

Length:	<u>10 m</u>	Water velocity:	<u>moderately high (0,2-0,7 m/s)</u>
Width (wet surface):	<u>1,3 m</u>	Turbidity:	<u>clear</u>
Width (normal surface):	<u>1,3 m</u>	Colour:	<u>clear</u>
Water level:	<u>moderately high</u>	Water temp:	<u>0,5 °C</u>
Average depth:	<u>0,06 m</u>	Trophic level:	<u>mesotrophic</u>
Maximum depth:	<u>0,1 m</u>		
Site description:	<u>Approximately 150 m uppstream the road</u>		

Bottom substrate and water vegetation (dominating type and grade of covering)

Inorganic mtrl, dom. 1:	<u>gravel</u>	Vegetation type, dom. 1:	<u>mosses</u>
Inorganic mtrl, dom. 2:	<u>sand</u>	Vegetation type, dom. 2:	<u>-</u>
Inorganic mtrl, dom. 3:	<u>small stones</u>	Vegetation type, dom. 3:	<u>-</u>

Clay:	<u><5%</u>	Above surf. plants:	<u>missing</u>	Fine detritus:	<u>missing</u>
Sand:	<u>5-50%</u>	Float. leaf plants:	<u>missing</u>	Large detritus:	<u>missing</u>
Gravel:	<u>>50%</u>	Long shoot plants:	<u>missing</u>	Fine dead wood:	<u><5%</u>
Small stones:	<u><5%</u>	Rosette plants:	<u>missing</u>	Large dead wood:	<u>missing</u>
Large stones:	<u>missing</u>	Mosses:	<u>5-50%</u>		
Small boulders:	<u>missing</u>	Periphyton:	<u>missing</u>		
Large boulders:	<u>missing</u>				
Flat rock:	<u>missing</u>				

Immediate surroundings 0-30 m (Dominating types)

Dominating 1:	<u>coniferous forest</u>	Dominating 2:	<u>open ground</u>	Dominating 3:	<u>-</u>
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Bank description 0-5 m

Vegetation type	Dom. species:	Sub.dom. species:
Dominating 1:	<u>trees</u>	<u>leaf</u>
Dominating 2:	<u>shrubs</u>	<u>-</u>
Dominating 3:	<u>-</u>	<u>-</u>
Shading:	<u>5-50%</u>	<u>-</u>

Influence

Type:	Strength:
A:	<u>-</u>
B:	<u>missing</u>
C:	<u>-</u>

Miscellaneous

The substrate quality was suitable for the kick sample method. Sampling was completed with a qualitative sample. There was some broken ice at the bottom.

LSM000269 (mars)

Biomass

Functional group	Biomass in sample (g)					Average	Standard-deviation	Biomass/sqm (g)	Proportion %
	1	2	3	4	5				
Filter feeders	1.1010	0.2210	0.1143	0.8340	0.8320	0.620	0.429	2.48	38.4
Detritus feeders	0.6689	0.2201	0.2982	0.2315	0.3407	0.352	0.184	1.41	21.8
Predators	0.0137	0.0000	0.0009	0.0144	0.0059	0.007	0.007	0.03	0.4
Grazers	0.0000	0.0000	0.0000	0.0000	0.0000	0.000	0.000	0.00	0.0
Shredders	0.9841	0.2887	0.4085	0.6439	0.8513	0.635	0.292	2.54	39.3
Other/unknown	0.0024	0.0012	0.0003	0.0017	0.0022	0.002	0.001	0.01	0.1
Sum:	2.77	0.73	0.82	1.73	2.03	1.62		6.46	100.00

LSM000269 (june)

Biomass

Functional group	Biomass in sample (g)					Average	Standard-deviation	Biomass/sqm (g)	Proportion %
	1	2	3	4	5				
Filter feeders	0.7374	2.4765	4.1520	2.2350	1.9335	2.307	1.229	23.07	56.3
Detritus feeders	0.5330	1.2855	0.4412	0.6937	2.5266	1.096	0.865	10.96	26.7
Predators	0.0262	0.7881	0.7141	0.3849	0.4119	0.465	0.303	4.65	11.3
Grazers	0.0384	0.0490	0.1643	0.1242	0.1227	0.100	0.054	1.00	2.4
Shredders	0.1204	0.1534	0.1000	0.0886	0.1435	0.121	0.028	1.21	3.0
Other/unknown	0.0057	0.0255	0.0043	0.0000	0.0085	0.009	0.010	0.09	0.2
Sum:	1.46	4.78	5.58	3.53	5.15	4.10		41.0	100.00

LSM000270 (mars)

Biomass

Functional group	Biomass in sample (g)					Average	Standard-deviation	Biomass/sqm (g)	Proportion %
	1	2	3	4	5				
Filter feeders	0.0110	1.0035	0.2335	0.0800	0.7662	0.419	0.441	1.68	7.5
Detritus feeders	1.1805	4.3590	2.8809	3.7283	4.4421	3.318	1.3491	3.27	59.2
Predators	0.3265	0.3161	0.3844	0.5591	1.9834	0.714	0.716	2.86	12.7
Grazers	0.0000	0.0007	0.0000	0.0000	0.1947	0.039	0.087	0.16	0.7
Shredders	0.4479	1.1491	1.1136	1.0146	1.5366	1.052	0.392	4.21	18.8
Other/unknown	0.0242	0.1827	0.0207	0.0482	0.0507	0.065	0.067	0.26	1.2
Sum:	1.99	7.01	4.63	5.43	8.97	5.61		22.43	100.00

LSM000270 (june)**Biomass**

Functional group	Biomass in sample (g)					Average	Standard-deviation	Biomass/sqm (g)	Proportion %
	1	2	3	4	5				
Filter feeders	0.5343	0.1788	0.1451	0.6660	0.4167	0.388	0.225	3.88	13.8
Detritus feeders	1.3004	2.0663	1.2802	3.0042	2.3531	2.001	0.732	20.01	71.3
Predators	0.5084	0.2399	0.1715	0.1985	0.6003	0.344	0.197	3.44	12.2
Grazers	0.1407	0.0375	0.0173	0.0046	0.0399	0.048	0.054	0.48	1.7
Shredders	0.0343	0.0256	0.0000	0.0215	0.0000	0.016	0.016	0.16	0.6
Other/unknown	0.0024	0.0024	0.0048	0.0325	0.0048	0.009	0.013	0.09	0.3
Sum:	2.52	2.55	1.62	3.93	3.41	2.81		28.06	100.00

LSM000271 (mars)**Biomass**

Functional group	Biomass in sample (g)					Average	Standard-deviation	Biomass/sqm (g)	Proportion %
	1	2	3	4	5				
Filter feeders	0.3660	0.8194	0.1997	0.1835	0.2447	0.363	0.265	1.45	33.1
Detritus feeders	0.4247	0.5433	0.1513	0.4506	0.4738	0.409	0.151	1.64	37.3
Predators	0.0000	0.0010	0.0000	0.0000	0.0392	0.008	0.017	0.03	0.7
Grazers	0.0001	0.0001	0.0000	0.0000	0.0000	0.000	0.000	0.00	0.0
Shredders	0.4248	0.1571	0.4618	0.0994	0.2383	0.276	0.161	1.11	25.2
Other/unknown	0.1460	0.0211	0.0222	0.0014	0.0043	0.039	0.061	0.16	3.6
Sum:	1.36	1.54	0.83	0.73	1.000	1.09		4.38	100.00