

**SARPSBORG ENERGIGJENVINNING 2 KS****TERMS OF PERMIT****1. Legal terms****1.1 Basis for the permit**

This permit is based on the following laws, regulations and guidelines:

- Law dated March 13, 1981 No. 6 on Protection against Pollution and Waste (with subsequent amendments)
- EU Directive 2000/76/EU
- EU Directive 2000/532/EF
- Regulation on Waste Incineration
- Regulation on Hazardous Waste
- Internal control. Regulation with guidance (H-2036)
- Report to the Storting No. 24 (2000-2001)
- BAT Reference Documents

**1.2 Pollution fees**

Pursuant to section 73 of the Pollution Control Act, the County Governor may impose pollution fees to ensure that the measures are implemented as stipulated in the permit.

**1.3 Violation of the terms**

Violation of the permit terms is punishable under the Pollution Control Act. In the event of a violation of this permit, or of the conditions attached to it, Chapter 10 of the Pollution Control Act shall apply if the violation is not prosecuted under stricter penal provisions.

**1.4 Changes to and reversal of the permit.**

The County Governor may revoke or amend the terms of the permit or impose new conditions and, if necessary, revoke the permit, if the conditions in Section 18 of the Pollution Control Act are present.

**1.5 Equipment replacement**

If the business is planning to make a substantial replacement of equipment that makes it technically feasible to counteract the pollutants or increase the recycling level in a significantly better way than when the permit was granted, the person responsible must notify the County Governor in advance, cf. Section 19 of the Pollution Control Act.

## **1.6 Closing down and shutdown**

If the business is closed down or stopped, the County Governor must be notified if the operations can lead to contamination after the closing down or shutdown.

## **1.7 Supervision**

The Company is required to allow representatives for the pollution control authorities or any party authorized by them to inspect the plant at any time.

## **1.8 Notification of acute pollution and spillage.**

In the event of acute pollution or danger of acute pollution, the County Governor must be notified as soon as possible. Cf. also Section 39 in the Pollution Control Act on notification duty and the regulations on notification of acute pollution or the danger of acute pollution dated July 9, 1992.

If problems arise that lead to spillage of a duration of more than 8 hours, the County Governor must be immediately notified of the cause and the relevant measures taken. This time limit also applies to operating problems on continuous meters.

The Pollution Control Authorities will impose a shutdown or similar measures under such conditions. The County Governor can order the implementation of measures to improve operation regularity and cleaning effect.

## **2 Types of waste**

### **2.1 Residual consumption waste and production waste**

The permit covers the incineration of residual waste following prior sorting of consumer waste and production waste. The relevant types of waste are listed in accordance with the European waste list in Sec. 9.3. Some types of waste may be regulated if alternative resource utilization is more socio-economical. The sorting must be aimed at both special waste and recyclable materials, and the residual waste must no longer be suitable for material recycling, for technical or socio-economic reasons. Consumer waste and production waste are classified by the definitions in the Pollution Control Act, i.e. Ordinary waste from households, business activities and services that have similar contaminating properties.

## **3 Plant operation requirements**

### **3.1 Technical requirements and plant design**

The existing limits for emissions to the air must be observed at all times. The plant must aim to continuously reduce its emissions of substances hazardous to health and the environment, and to the extent technically and economically feasible, using the best available technology.

Best available technology here means the most efficient and advanced steps in the development of waste incineration and cleaning technology in the EEA, cf. "BAT Reference Documents".

Operations should be based on the maximum utilization of the heat released from the combustion process for energy purposes.

TECHNICAL OPERATIONS REQUIREMENTS		
Parameter	Requirement	Logging frequency
After-combustion chamber temperature	> 850 °C	1 min
Retention time in the combustion chamber after the injection of secondary air	> 2 sec	
Non-incinerated organic residue in slag	< 3 weight % TOC	4 times/yr

*Table 1. Technical operations requirements. (Definitions and procedures are described in Ch. 9)*

The combustion gases should, after the final injection of combustion air, even under the most adverse conditions and at full capacity, be heated to 850 °C in a controlled and uniform manner. The temperature should be maintained for at least 2 seconds before cooling. The temperature should be measured near the inside wall of the chamber, before the gas comes into contact with cooled surfaces. Measurements of oxygen concentration and pressure should also be made.

To verify the requirements set out in Table 1, the retention time and minimum temperature of the furnace gas should be checked and documented when stable operations are achieved and at least once under the worst imaginable operating conditions.

### **3.2 Use of support burner for emission limits compliance**

The technical requirements and set emission limits must be complied with under all possible operating conditions. In the event of deviations from normal, stable operating conditions or during start-up/shutdown, the support burner must operate automatically to ensure sufficiently high temperature in the secondary zone.

### **3.3 Input stop**

The plant will be operated with a functioning automatic system that prevents the supply of waste to the combustion chamber

- at start-up, until the combustion temperature in the after-combustion chamber has reached 850 °C
- when the temperature drops below 850 °C in the after-combustion chamber
- when continuous emission measurements show that an emission limit value is exceeded continuously or several times during an 8 hour period as a result of

disturbances or failure of the treatment plant.

### 3.4 Work environment

The plant must be built and operated such that the working environment does not suffer. If the company believes that the stipulated conditions in this permit cannot be implemented without adversely affecting the working environment, it is obliged to inform the County Governor immediately. The County Governor will amend the permit and impose the necessary measures.

This condition does not preclude imposing other requirements on the basis of other legislation with regards to the indoor environment or safety.

## 4 Emissions into the air

### 4.1 Furnace gas and chimney height

The gas emission speed from the chimney should be at least 20 m/s under normal operating variations. The temperature from the chimney should be at least 125 °C. The exhaust gases shall be emitted at a height of at least 51 m above the ground (cutting height 79 m).

### 4.2 Emission limits for air and measurement requirements

EMISSION LIMITS FOR EMISSIONS INTO THE AIR							
Parameter	Requirement <sup>1)</sup> (Max. concentrations)		Check measurements			Operating instruments for continuous measurement	
	24 hour average mg/Nm <sup>3</sup>	1/2 hour average mg/Nm <sup>3</sup>	Measurement frequency	Number of samples/analysis per measurement	Min. average time per sample	Min. logging frequency	Average time per reg.
Total dust	10 √	30 √	annual	cont.	1 hour	30 min	24 hours
Hg	0.03 √		2 x annually	4	1 hour		
Cd+Tl	0.05 √		2 x annually	4	1 hour		
Pb+Cr+Cu+Mn+Sb+As+Co+Ni+V+Sn	0.5 √		2 x annually	4	1 hour		
CO	50 √	100 √	annual	cont.		2 min	1/2 hour
HF (inorganic fluoride)	1 √	4 √	annual	Cont.	1 hour		
HCl (Inorg. Chloride (g))	10 √	60 √	annual	cont.	1 hour	30 min <sup>3)</sup>	24 hours
TOC	10 √	20 √	annual	Cont.	1 hour	30	24 hours

NO <sub>x</sub> (NO <sub>2</sub> )	200 <sup>2)</sup> √	400 <sup>2)</sup> √	annual	4	1/2 hour	5 min	1/2 hour
NH <sub>3</sub>	10		annual	4	1 hour		
SO <sub>x</sub> (SO <sub>2</sub> )	50 <sup>4)</sup> √	200 √	annual	cont.	1 hour	30 min	24 hours
Dioxins	0.1 <sup>5)</sup> √		2 x annually	3	3 hours		

*Table 2. Licensing requirements for emissions into the air (Definitions and procedures are described in Ch. 10)*

1) referred to 11 vol % O<sub>2</sub> and dry furnace gas, temp. 273K, pressure 101,3 kPa

2) as NO<sub>2</sub>

3) possibly documented otherwise

4) as SO<sub>2</sub>

5) ng/Nm<sup>3</sup> measured as 2,3,7,8 TCDD equivalents (Nordic standard)

- For parameters with continuous parameters, the results from calibrating measuring equipment can replace the annual control measurement if such calibration is performed at least once per year.
- During the first 12 regular months when the plant is operating, measurements of the heavy metals, dioxins and furans shall be performed every three months. During this operating period, the County Governor shall continuously report on the measurement results, as well as results from the continuous measurements at the plant.
- The results of the emission requirements for all parameters in Table 2 shall be compiled in separate reports, to be sent to the county governor within 6 and 12 months after the start of operations.
- These emission limits must also be met when the original effect of the emission reducing equipment has been reduced as a result of wear and tear or any other significant and expected deterioration of equipment that affects emissions.
- When calculating hourly and half-hourly average values, the measurement values from the whole ordinary operating time of the plant shall be used. The daily mean values shall be determined from the calculated hourly or half-hourly mean values.

### **4.3 Measurement requirements**

All measurements at an incineration plant, emissions into air and water, operating parameters, noise etc. shall be made representatively.

All measurements shall primarily be made in accordance to CEN standards. If the CEN standards are not available, the standards should be used to ensure the provision of data from a comparable scientific quantity. It is preferable to use Norwegian standards, or, if such a standard does not exist, ISO or other international standards. If relevant standards are not available, the chosen measuring method must be relevant and documented, stating the overall measurement accuracy.

All measurements should be carried out in accordance with the recognized methods for quality assurance. If external measurement instances are used for sampling/analysis, the measurement instances should, to the extent possible, be accredited.

Measuring equipment for the continuous measurement of emissions to air and water should be calibrated at least every 12 months, using parallel measurements or similar methods. The equipment should be calibrated using parallel measurements at least every 3 years.

Measuring equipment for continuous measurement of emissions to air shall have an accuracy such that the value of the 95% confidence interval for a single measurement result, at the daily mean level of the emission limits does not exceed the following percentages of the daily mean values:

Total dust:	30%
TOC:	30%
HCl:	40%
HF:	40%
SO <sub>2</sub> :	20%
NO <sub>x</sub> :	20%
CO:	10%

The continuous measurement of CO emissions to air must be ensured, especially when using an emergency meter. It should be put into operation as soon as possible upon the failure of the ordinary measuring equipment.

#### **4.4 Odor and other annoyances.**

The plant shall be designed, built and operated in such a way that odors, litter or other annoyances from the plant will not appear injurious or be at the risk of harm or inconvenience to the immediate environment.

### **5. Emissions into the water**

#### **5.1 Emission limits**

The plant should not have process emissions to water.

Exhausted boiler water can be added to Glomma after pH adjustment (pH 6-9) and dilution.

Sewage and drainage from the plant and the adjacent areas where waste is disposed must be collected, so that discharge to the ground and other recipients is not possible. Adequate capacity for the storage of contaminated runoff shall be ensured, from rainwater, spillage and fire extinguishing.

Every possible source of an acute discharge of water, e.g. Piles, slag extinguishers etc., shall be secured by internal return or other approved disposal.

## **5.2 Plumbing drains**

Plumbing drains must be directed to a municipal wastewater treatment plant. Fredrikstad Municipality can set its own requirements and fees for discharges of plumbing drain waste water.

## **6 Residual products**

### **6.1 Disposal of combustion residues**

Slag from the oven must contain less than 3 % organic carbon (TOC) or have a glow loss of less than 5 % of the dry weight of the material. A measurement should be carried out at least every 3 months pr. Proportion of unburned material of the slag at the plant. The slag should be sufficiently cooled before further handling.

Magnetic metals in the slag must be separated and recycled if no separation of metals has been carried out before the waste was recycled.

It must at all times be protected against the spread of dust during storage, transshipment and transport of combustion residues.

Sludge, boiler dust, dust and fly ash, as per the purification process, shall be disposed of in accordance with the provisions of the Special Waste Regulations, if these contain hazardous substances. For each fraction, the dangerous substance content must be tested and documented. If a fraction contains environmental and health hazardous substances at a level that exceeds the percentage limit values of the special waste regulations (Appendix 3 and the EU waste list), this should be regarded as special waste. Slag can be temporarily stored for up to 4 months before the analysis test, and should be conducted at least once per year.

Slag and ash waste products that are not covered by the special waste regulations following tests shall, if possible be recycled or used as filling for residual waste, following the necessary permits in accordance with the Pollution Control Act.

The plant shall at all times have a written delivery agreement with an approved treatment plant for combustion residues of a duration of no less than 6 months.

### **6.2 Alternative waste disposal.**

In the event of reduced combustion capacity, planned or unforeseen downtime, waste that cannot be stored in a bunker should be stored outside the plant, in order to move it to the plant at a later date. Temporary waste storage (fuel) pending available combustion capacity shall take place at approved treatment facilities for residual waste.

## **7 Noise**

### **7.1 Maximum permissible noise level.**

The following emission requirements (equivalent levels) should be satisfied at the affected residences.

Day time (Monday - Saturday):	at 0600-1800	50 dB(A)
Evening (Monday - Saturday):	at 1800-2200	45 dB(A)
Sundays and public holidays	at 0600-2200	45 dB(A)
Night every day:	at 2200-0600	40 dB(A)

If the noise comprises clear single tones and/or pulse sounds, the threshold value for the equivalent level shall be reduced by 5 dB.

The max. sound level shall not exceed the limit value for the equivalent level by more than 10 dB.

Compliance documentation for noise requirements should be carried out by license measurement in the 1st year of operations. Cf. terms 8.5. The County Governor may require further measurements after the documentation has been assessed.

### **7.2 Transportation**

Waste transport to and from the plant will be carried out between 7am and 7pm, Monday to Friday.

## **8 Registration, control and monitoring**

### **8.1 Waste quantities**

Upon receipt of waste, the operator shall ensure that each type of waste is weighed and registered in accordance with the waste list. Each year, documentation must be submitted showing the total amount of residual waste received for incineration at the plant distributed to suppliers, cf. requirements 8.5.

### **8.2 Energy utilization**

The thermal energy generated should be utilized as far as practicable. The energy in the boiler shall be utilized with a utilization rate of at least 50% within 1 year after the plant enters regular operation. The energy utilization rate must be calculated for each month.

### **8.3 Operational control**

In accordance with the Internal Control Regulations dated December 6, 1996, the plant owner is obliged to prepare an internal control program for their activities for, inter alia, to ensure compliance with the requirements of this permit.

The plant shall be controlled with measuring equipment that monitors relevant operating and control parameters in the combustion process. As a minimum, the following measurements shall be taken:

- a) Continuous measurements of oxygen concentration, pressure, temperature and



water vapor content in the furnace gas. It is not required to measure the water vapor content if the furnace gas is dried before the emission measurements are carried out.

- (b) Continuous measurement of temperature after the last blow-in of combustion air, measured near the interior wall of the combustion chamber or at another representative point, with the permission of the pollution control authority.
- c) measuring the amount of waste incinerated.

The retention time and minimum temperature should be checked in accordance with the requirement in Section 3.1 at least once when the combustion plant is put into operation and under worst-case operating conditions.

#### **8.4 Self-control and responsibility**

The plant owner is obliged, in accordance with regulations on internal control of December 6, 1996, through instructions, control and other measures, to ensure that the operation of the plant says that disadvantages and damage effects are minimized at all times. This includes the duty to control the waste as regularly as possible, to seek to prevent abnormal operating conditions causing increased emissions, and to reduce or suspend operations under such conditions if significant breaches of normal emissions would otherwise occur.

#### **8.5 Measurement program**

Requirements for measurements, continuous operational control instruments, registration and reporting are given in Chapter 4.2, Table 2. Further details are described in Chapter 9.

#### **8.6 Reporting and deadlines.**

Shall be reported to the County Governor on a standard self-report form, which is sent to the facility in January each year. This must be returned to the County Governor, with the necessary attachments, by 01.03 the same year. It should include emission data, deviations from the requirement and the annual quantities. Measurements for the reporting year shall be carried out within a reasonable time before the end of the year, so that measures can be implemented and new measurements taken before the deadline. Attached is a brief summary of the year's operations, as specified below:

- Total operating time
- Total amount of waste processed by the supplier
- Amount of slag and disposal
- Amount of dust and reaction products, as well as disposal
- Energy produced, energy utilized and energy utilization rate for each month, as well as annual averages
- For parameters where continuous meters are required, a summary should show the ranges of variation, trend curves and average values. This applies to both operating parameters and air discharge parameters.

### **9 Definitions, procedures and types of waste**

## 9.1 Definitions

*Energy utilized* - Energy supplied by wall incinerating plants in the form of thermal energy or electricity plus internal energy consumption for heating and electricity.

*Energy produced* - Energy produced from boiler and made available for energy utilization in the form of thermal energy.

*Energy utilization rate* - Energy utilized, divided by energy produced, expressed as a percentage

*Measurement period* - the total period during which the measurement (sampling) is carried out.

*Measurement frequency* - the frequency for repeating each measurement period.

*Log frequency* - the frequency for recording values from continuous measuring instruments.

*Mean Time* - the period for calculating the arithmetic mean.

*24 Hour mean value* - The arithmetic mean of single samples (or logs) taken over a 24 hour period.

*1/2 hour mean* - The arithmetic mean of single samples (or logs) taken over a 1/2 hour period.

*Secondary zone* - the part of the combustion chamber that comes after the last supply of secondary combustion air, and where the main amount of the combustion gases passes.

## 9.2 Procedures

From Tables 1 and 2, it is mainly outlined which procedural requirements are set for license measurements and operating register permits. This applies to measurement frequency, averaging times, number of samples per unit. measurement, as well as logging frequency and averaging time for continuous operational records.

The measurements shall mainly be carried out according to Norwegian standards or other international standards, where applicable. If there is no such standard, the measurement method and the grinding procedure chosen shall be weather relevant, and it shall be bedridden specifying the overall measurement accuracy for sampling and analysis.

The company is responsible for ensuring that the analysis laboratory has sufficient quality control routines or that laboratories that are accredited by Norwegian Accreditation are used.

The Norwegian Standard for Sampling and Analysis shall be used where this exists. For parameters where other standards are used, these must be relevant and possibly clarified with the county governor.