1. Identification of the substance and of the company

1.1 Product identifier
This material safety data sheet is valid for Oil Shale Thermal Processing Residue with the following specific commercial name: Burnt Oil Shale (BOS)

1.2 Relevant identified uses of the substance and uses advised against
BOS is primarily used in industrial installations for the production of cements and other hydraulic binders. It is also used in soil stabilization and as a fertilizer in agriculture.

Eesti Energia Narva Elektrijaamad REACH registration number is 01-2119703178-42-0002
EC number 297-648-1
CAS number 93685-99-5

1.3 Details of the supplier of the material safety data sheet
Manufacturer / supplier: Eesti Energia Narva Elektrijaamad AS
Street / post box: Elektrijaama tee 59
Postal code / city: 21004 Narva
Phone: +372 71 66100
Enquiries about this material safety data sheet: nej@energia.ee

1.4 Emergency telephone number
Public emergency number: 112

2. Hazards identification

2.1 Classification of the substance
Classification according to the regulation (EC) No 1272/2008:

- GHS05 Corrosion
- GHS07 Exclamation mark
- GHS08 Health hazard

Signal word: Danger
Eye Dam. 1 Serious eye damage / eye irritation category 1
STOT SE 3 Specific target organ toxicity (single exposure) category 3
STOT RE 2 Specific target organ toxicity (repeated exposure) category 2
H318 Causes serious eye damage.
H335 May cause respiratory irritation.
H373 May cause damage to organs (lung) through prolonged or repeated exposure.

Classification according to the directive 1999/45/EC:
- Xn Harmful
- Xi Irritant
- R48/20 Harmful: danger of serious damage to health by prolonged exposure if inhaled.
- R37 Irritating to respiratory system.
- R41 Risk of serious damage to eyes.
2.2 Label elements of the substance

2.2.1 Label elements of the substance according to the regulation (EC) No 1272/2008:

Hazard pictograms and signal word:

- GHS05 Corrosion
- GHS07 Exclamation mark
- GHS08 Health hazard

Signal word: Danger

Hazard statements

- H318 Causes serious eye damage.
- H335 May cause respiratory irritation.
- H373 May cause damage to organs (lung) through prolonged or repeated exposure

Precautionary statements

- P260 Do not breathe dust.
- P271 Use only outdoors or in a well-ventilated area.
- P280 Wear protective gloves/protective clothing/eye protection/face protection.
- P305+351+338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
- P337+P313 If eye irritation persists: Get medical advice/attention.

2.2.2 Label elements of the substance according to the directive 1999/45/EC

- Xn Harmful

Hazard statements

- R48/20 Harmful: danger of serious damage to health by prolonged exposure if inhaled.
- R37 Irritating to respiratory system.
- R41 Risk of serious damage to eyes.

Precautionary statements

- S22 Do not breathe dust.
- S24/25 Avoid contact with skin and eyes.
- S26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
- S36/37/39 Wear suitable protective clothing, gloves and eye/face protection.

2.3 Additional information on hazards

The main hazard of the substance is the release of dust. Long term inhalation of this dust may lead to lung disease known as silicosis. Symptoms are cough and dyspnoea. Silicosis may lead to an enhanced risk of lung cancer.

On the short term the principal risk is severe eye irritation and damage.

When the substance accidentally comes into contact with water, a strongly alkaline solution is produced.
3. Composition/information on ingredients

3.1 Substance

OIL SHALE THERMAL PROCESSING RESIDUE

Commercial Name: Burnt Oil Shale (BOS)

EC number: 297-648-1

CAS number: 93685-99-5

Classification of Burnt Oil Shale (BOS):

Classification according to regulation (EC) No 1272/2008:
- Eye Dam. 1; GHS05; H318
- STOT SE 3; GHS07; H335
- STOT RE 2; GHS08; H373

Signal word: Danger

Classification according to directive 67/548/EEC:
- Xn, R48/20-37-41

Physical form: Fine powder

For the wording of the abbreviations used in this section, refer to section 2.1.

Oil shale thermal processing residue is produced in thermal reactors at temperatures above 650°C. Input into these reactors is natural raw oil shale only. This multiconstituent substance consists essentially of SiO$_2$, Al$_2$O$_3$, Fe$_2$O$_3$, CaO, SO$_3$ and MgO.

Various qualities may contain various associated minerals depending on the origin of the oil shale and on the processing conditions. These belong to the substance, as indicated by the REACH definition of substances.

Burnt oil shale BOS contains several main mineral phases, namely Anhydrite, Calcium oxide (Free Lime), Calcite, Periclase and Quartz within the following concentration ranges:

<table>
<thead>
<tr>
<th>IUPAC-Name</th>
<th>EC number</th>
<th>CAS number</th>
<th>Elemental formula</th>
<th>Range of concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anhydrite</td>
<td>604-615-0</td>
<td>7778-18-9</td>
<td>CaSO$_4$</td>
<td>0-20 % (w/w)</td>
</tr>
<tr>
<td>Calcium oxide (Free lime)</td>
<td>215-138-9</td>
<td>1305-78-8</td>
<td>CaO</td>
<td>2 - 25 % (w/w)</td>
</tr>
<tr>
<td>Calcite (Limestone)</td>
<td>215-279-6</td>
<td>1317-65-3</td>
<td>CaCO$_3$</td>
<td>2 - 25 % (w/w)</td>
</tr>
<tr>
<td>Periclase (Magnesium oxide)</td>
<td>215-171-9</td>
<td>1309-48-4</td>
<td>MgO</td>
<td>3-5 % (w/w)</td>
</tr>
<tr>
<td>Quartz</td>
<td>238-878-4</td>
<td>14808-60-7</td>
<td>SiO$_2$</td>
<td>20-35 % (w/w)</td>
</tr>
<tr>
<td>XRD-Amorphous fraction</td>
<td></td>
<td></td>
<td></td>
<td>5 - 80 % (w/w)</td>
</tr>
<tr>
<td>Respirable Crystalline Silica RCS (concentration as defined in EN 481):</td>
<td></td>
<td></td>
<td></td>
<td>1 - 10 % (EN 481)</td>
</tr>
</tbody>
</table>

4. First aid measures

4.1 Description of first aid measures

General notes

No personal protective equipment is needed for first aid responders, except under very dusty conditions, where a dust mask as defined in section 8.2.2 should be worn.

Inhalation

Move the person to fresh air. Clear rapidly any dust in throat and nasal passages. Contact a physician if irritation persists or later develops or if discomfort, coughing or other symptoms persist.

Skin contact

Remove dry material mechanically, and then rinse abundantly with water. Contaminated clothing, footwear, watches, etc. should be removed and cleaned thoroughly before re-using them.

Eye contact

Do not rub eyes in order to avoid possible corneal damage by mechanical stress. Remove contact lenses if any. Incline head to injured eye, open the eyelids widely and flush eye(s) immediately by thoroughly rinsing with plenty of clean water for several minutes to remove all particles. Avoid flushing particles into uninjured eye. If possible, use isotonic water (0.9% NaCl). Always contact a specialist of occupational medicine or an eye specialist.
Ingestion
If victim is conscious, rinse mouth and give abundantly water to drink. Do not induce vomiting. In case of persisting effects contact a physician.

4.2 Most important symptoms and effects, both acute and delayed
Eyes: Eye contact with BOS particles in eyes may cause corneal damage when rubbed with hands/fingers.
Inhalation: Repeated inhalation of BOS dust over a long period of time increases the risk of developing lung diseases.

4.3 Indication of any immediate medical attention and special treatment needed
No need of immediate attention or special treatment has been identified. When contacting a physician with a reasonable ground for suspecting an adverse effect of BOS, this MSDS should be presented to him.

5. Fire fighting measures

5.1 Extinguishing media
In case of a fire of other materials nearby, do not use water - avoid humidification of BOS, if possible. Otherwise all usual extinguishing media are compatible with BOS.

5.2 Special hazards arising from the substance
BOS is not combustible and does not facilitate or sustain the combustion of other materials. In case of a fire of other materials nearby, additional hazards caused by BOS have not to be feared.

5.3 Advice for fire-fighters
Avoid generation of dust. If spreading of dust is unavoidable, use breathing apparatus (filter P3, see section 8.2.2)

6. Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
In the absence of dust and in well ventilated locations, no personal protective equipment is needed. In other situations, respiratory protection according to section 8.2.2. is needed and the advices for safe handling and use given in section 7 should be considered. Avoid humidification of BOS. Remark: harmful respirable dust is invisible.

6.2 Environmental precautions
Do not wash BOS into sewage and drainage systems or into bodies of water (because of rise of pH).

6.3 Methods and material for containment and cleaning up
Collect spilled material as dry as possible in a container for future use. Do not sweep. Use dry cleanup methods, not causing dust spreading, such as vacuum clean-up or vacuum extraction which do not cause airborne dispersion, as e.g. industrial portable units, equipped with high efficiency particulate filters (HEPA filter) or equivalent technique. Never use compressed air. Ensure that the workers wear appropriate personal protective equipment and prevent dust from spreading.

6.4 Reference to other sections
Information about safe handling, see section 7. Information about personal protective equipment, see section 8. Information about disposal, see section 13.

7. Handling and storage
7.1 Precautions for safe handling
7.1.1 Protective measures
For personal protective measures follow the recommendations given in Section 8. Measures to prevent fire Not applicable.
Measures to prevent aerosol and dust generation
Handle with care in order to avoid airborne dispersion. Provide efficient ventilation. In industrial environment use closed handling, storage and transport systems. In semi-closed systems, remediate emission sources by containment, local exhaust ventilation etc. as far as feasible. Keep respirable dust concentration as low as possible, at least below applicable occupational limit values.

Measures to protect the environment
Provide industrial production units with state-of-the-art air cleaning equipment in consultation with local authorities (e.g. cyclones, wet scrubbers or bag filters).
No particular measures are needed for professional or consumer use.

7.1.2 Information on general occupational hygiene
Use protective gloves to avoid skin contact. Don't inhale dust. In dusty or not well ventilated environment, wear dust mask and protective goggles.
Do not handle or store near food and beverages or smoking materials and do not eat, drink or smoke. Wash hands before breaks and at the end of work. Change clothes at the end of work.

7.2 Conditions for safe storage, including any incompatibilities
Information about fire and explosion prevention
As BOS is not combustible and has no explosive properties, no such measures have to be taken.

Storage conditions
The storage conditions should allow keeping the concentration of respirable dust at the work places below the TLV limit values. BOS should be stored under waterproof, dry conditions (i.e. with internal condensation minimised), clean and protected from contamination.
If BOS is supplied in drums or sacks, keep it in the closed original containers in a cool and dry place.
If BOS is supplied as bulk material, store it in appropriate silos or vessels.

Precautions to be taken in the case of bulk storage
Never enter a confined space, such as a silo, bin, bulk truck, or other storage container or vessel that stores or contains BOS without taking the proper safety measures to prevent engulfment/suffocation.
BOS can build-up or adhere to the walls of a confined space. It can release, collapse or fall unexpectedly.

Requirements to be met by storerooms and receptacles
Storage rooms, silos and other receptacles and their filling systems and discharge systems should protect the material from moisture and be operable with minimal dust emission.

Mixed storage
VCI storage class: 13 (non-combustible solids)
Mixed storage should be avoided with materials, which require water as extinguishing medium in case of a fire. Keep away from food, beverages and animal feed.

7.3 Specific end use(s)
No additional information on specific end uses (identified end uses see Annex 1).

8. Exposure controls/personal protection

8.1 Control parameters

European indicative limit values (according to directives 91/322/EEC, 2000/39/EC and 2006/15/EC):
none

DNEL and PNEC values
DNEL = Derived no effect level (concentration or dose, below which no effects on humans are to be expected)
PNEC = Predicted no effect concentration (concentration, below which no effects on the environment are to be expected)

<table>
<thead>
<tr>
<th>Systemic toxicity effects</th>
<th>Values for the work place</th>
<th>Values for the population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chronic, inhalation</td>
<td>DNEL = 0.233 mg/m³</td>
<td>DNEL = 0.233 mg/m³</td>
</tr>
</tbody>
</table>
Effects on the environment
There is no PNEC value for effects on the environment as the substance has no properties by which it could significantly affect the environment.

8.2 Exposure control

8.2.1 General protective and hygienic measures
Use measures to reduce the generation of dust and to avoid dust propagating in the environment such as dedusting and dry clean-up methods which do not cause airborne dispersion.
Provide adequate ventilation, including appropriate local extraction to ensure that the workplace exposure limits are not exceeded.
Do not inhale dust; avoid contact with the eyes and skin.
Do not eat, drink or smoke at work. Keep away from food, beverages and animal feed.
Wash hands before breaks and at the end of work.
Remove contaminated clothing, footwear, watches, etc. and clean thoroughly before re-using them.

8.2.2 Personal protective equipment (PPE)
The personal protective equipment shall be selected according to the specific working place, depending on the quantities handled, the concentration of dangerous substances as well as the risk of exceeding the TLV limit value.
The equipment suppliers must ensure that their PPE provided fully complies with the EU Machinery Directive 2006/42/CE, the EU Product Safety Directive (RS 930.111) and also with EN international standards on personal protective equipment (according to directive 89/686/EEC).

Respiratory protection
In case of exposure to dust levels potentially above exposure limits, use appropriate respiratory protection. It should be adapted to the existing dust concentration and meet the relevant EN standards.
Depending on the result of the evaluation of the risk and the possible extent of exceeding the TLV limit value, use a suitable dust respirator shall be selected as follows:
- Typically filter P3 shall be used
- Full mask P2 only protects against dust concentrations of up to 10 times the TLV value.
- Semi mask P3 or FFP3 protects against dust concentrations of up to 30 times the TLV value.
- Full mask P3 protects against dust concentrations of up to 400 times the TLV value provided the mask fits tight to the face.
The use of FFP1 disposable masks as a protection against quartz-containing dusts would be illegal

Hand protection
Use impervious, abrasion- and alkali-resistant gloves, internally lined with cotton.
Suitable glove-material: Nitril rubber and many other (more expensive) alkali-resistant elastomer materials.
Unsuitable glove-material: leather, textile tissues, natural latex (because of risk of allergies).

Eye/face protection
Wear approved glasses or safety goggles according to EN 166 when handling BOS to prevent contact of dust particles with the eyes.

Body protection
Wear closed long-sleeved protective clothing with close fittings at openings. Use closed boots.

8.2.3 Environmental exposure controls
Take the necessary measures to avoid dust propagation into the environment, e.g. provide industrial production units with the necessary air cleaning equipment, as indicated in section 7.1.
Contain any spills as indicated in section 6.3.
9. Physical and chemical properties

9.1 Information on basic physical and chemical properties

The information in this section is taken from the Chemical Safety Report of the substance.

Appearance: greyish to slightly brownish fine solid
Odour: odourless
Odour threshold: none (odourless)

pH: (T = 20°C, suspension in water): 11-13.5
Melting point range 1050 - 1200 °C
Boiling point: not applicable (mineral solid)
Flash point: not applicable (mineral solid)
Evaporation rate (ether = 1): not applicable (mineral solid)
Flammability: non flammable solid
Lower flammability limit: not applicable (mineral solid)
Upper flammability limit: not applicable (mineral solid)
Vapour pressure (20°C): not applicable (mineral solid)
Vapour density (air = 1): not applicable (mineral solid)
Relative density (20 °C): 2.7 - 2.9 g/cm³
Solubility in water (20°C): <1 g/l
Solubility and stability in solvents: not applicable (mineral solid)
Partition coefficient (n-octanol/water) not applicable (mineral solid)
Auto-ignition temperature: not applicable (mineral solid, stable at 400 °C)
Decomposition temperature above 650 °C
Dynamic viscosity: not applicable (mineral solid)
Kinematic viscosity: not applicable (mineral solid)
Explosive properties: none
Oxidising properties: none

9.2 Other information
Not applicable

10. Stability and reactivity

10.1 Reactivity
BOS reacts with water in a similar way to cement.

10.2 Chemical stability
BOS is stable as long as it is properly stored under dry conditions (see Section 7) and without contact with incompatible materials (as indicated in section 10.5).

10.3 Possibility of hazardous reactions
In the absence of the incompatible substances mentioned in section 10.5, no hazardous reactions have to be expected.

10.4 Conditions to avoid
Humid conditions during storage may cause lump formation and loss of product quality.
Apart from intended uses of BOS, it should not be mixed with water.

10.5 Incompatible materials
BOS is incompatible with acids and ammonium salts as well as with hydrofluoric acid and its salts.
Under humid conditions, BOS corrodes aluminium or other non-noble metals, e.g. brass.

10.6 Hazardous decomposition products
Under foreseeable conditions, BOS will not decompose into any hazardous products.
11. Toxicological information

The information in this section is taken from the Chemical Safety Report of BOS. For the wording of the abbreviations used in this section, refer to section 16.

11.1 Information on toxicological effects

In general:
BOS is an only slightly water-soluble solid mineral substance of natural origin which was thermally treated and finely ground. BOS presents the following potential adverse effects to humans:
- Long term inhalation of respirable dust (particle diameter < 5 µm) of BOS may lead to irritation of the respiratory system and finally to lung diseases, mainly silicosis, enhancing the risk of lung cancer.
- Contained hard particles may lead to corneal damage when got in the eye and being rubbed in it.
- Alkaline particles (containing free lime) may lead to strong eye irritation.

Single dose (acute) toxicity
LD50, oral, rat, >2000 mg/kg
LD50, dermal no data
LC50, inhalation no data

Repeated dose toxicity
Repeated dose, oral no data
Repeated dose, dermal no data
Repeated dose, inhalation LOAEC = 0.05 mg/m$^3$ respirable quartz (target organ: lung)

Irritation/corrosion of the skin: not irritating
Irritation of the eyes: irritating
Irritation of the respiratory system: irritating

Corrosivity not corrosive
Sensitisation: not sensitising to the skin
no data for the respiratory system (no sensitisation expected)

Mutagenicity
Mutagenicity to bacteria test negative
Mutagenicity to mammalian cells test negative
Erythrocyte Micronucleus test negative

Carcinogenicity
No data (carcinogenicity is not expected because of negative results of mutagenicity studies.)

Reproductive toxicity (development toxicity / influence on fertility)
No data (no studies exist which would suggest or indicate reproductive toxicity by this kind of material)

Available DNEL values

<table>
<thead>
<tr>
<th>Long term effects, inhalation</th>
<th>Values for the work place</th>
<th>Value for consumers</th>
</tr>
</thead>
<tbody>
<tr>
<td>DNEL $= 0.233$ mg/m$^3$, inhalable</td>
<td>DNEL $= 0.233$ mg/m$^3$, inhalable</td>
<td></td>
</tr>
<tr>
<td>(LOAEL $= 0.699$ mg/m$^3$, inhalable)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DNEL $= 0.017$ mg/m$^3$, respirable</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Aspiration hazard
Based on available data, the classification criteria are not met.
12. Ecological information

The information in this section is taken from the Chemical Safety Report of BOS. For the wording of the abbreviations used in this section, refer to section 16.

12.1 Environmental toxicity

As the water solubility of BOS is rather low (<1 g/l), the material has been tested using accommodated suspensions of the material powder in freshwater (Water Accommodated Fraction, WAF). The values given below in mg/l correspond to the quantity of powder dispersed in water.

The short term tests indicate a low toxicity to fish and Daphnia with a NOEC >100 mg/l. However with green algae a short term EC50 value of 82.7 mg/l and a NOEC >3.2 mg/l was obtained.

The long term tests over 21 days indicate low toxicity for growth and reproduction of Daphnia with a NOEC of >1 mg/l and also for the growth rate of green algae with a NOEC >1 mg/l.

BOS caused no respiratory inhibition of activated waste water treatment sludge at a concentration of 1000 mg/l.

Test results

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>LC50 (96 h) for freshwater fish</td>
<td>≥100 mg/l</td>
</tr>
<tr>
<td>NOEC (96 h) for freshwater fish</td>
<td>≥100 mg/l</td>
</tr>
<tr>
<td>LC50 long-term, for freshwater fish</td>
<td>no data</td>
</tr>
<tr>
<td>EC50 acute (48 h) for freshwater invertebrates (Daphnia Magna)</td>
<td>&gt;100 mg/l</td>
</tr>
<tr>
<td>EC50 acute (72 h) for the growth rate of freshwater green algae</td>
<td>82.7 mg/l</td>
</tr>
<tr>
<td>NOEC acute (72 h) for the growth rate of freshwater green algae</td>
<td>3.2 mg/l</td>
</tr>
<tr>
<td>NOEC (21 days) for the survival of adult freshwater invertebrates (Daphnia Magna)</td>
<td>32 mg/l</td>
</tr>
<tr>
<td>NOEC (21 days) for the growth and reproduction of freshwater invertebrates (Daphnia Magna)</td>
<td>1.0 mg/l</td>
</tr>
<tr>
<td>LC50 for sediment organisms</td>
<td>study is proposed</td>
</tr>
<tr>
<td>EC50/LC50 for land microorganisms</td>
<td>earthworm study is proposed</td>
</tr>
<tr>
<td>EC50/LC50 for land plants</td>
<td>no data</td>
</tr>
<tr>
<td>NOEC (3h) for activated sludge (sewage) microorganisms</td>
<td>≥1000 mg/l</td>
</tr>
</tbody>
</table>

PNEC-Values (Predicted No Effect Concentration)

<table>
<thead>
<tr>
<th>Environment</th>
<th>PNEC</th>
<th>Assessment factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freshwater</td>
<td>0.02 mg/l</td>
<td>50</td>
</tr>
<tr>
<td>Seawater</td>
<td>0.002 mg/l</td>
<td>500</td>
</tr>
<tr>
<td>Aqua intermittent releases (*)</td>
<td>0.827 mg/l</td>
<td>100</td>
</tr>
<tr>
<td>Sewage microorganisms</td>
<td>100 mg/l</td>
<td>10</td>
</tr>
<tr>
<td>Sediment microorganisms</td>
<td>no data</td>
<td></td>
</tr>
<tr>
<td>Soil micro-organisms</td>
<td>no data</td>
<td></td>
</tr>
<tr>
<td>Soil macro-organisms</td>
<td>no data</td>
<td></td>
</tr>
</tbody>
</table>

*: "Aqua intermittent release" is defined as: less than 1x per month during less than 24 hours.

Possible toxicity effects of leachable heavy metals - if any - are already included in the test results presented in this section.

12.2 Persistence and degradability:

Not applicable. BOS is an inorganic, not oxidisable material.

12.3 Bioaccumulative potential:

Bioconcentration factor (BCF): not applicable for inorganic materials

Distribution coefficient octanol/water: not applicable for inorganic materials

12.4 Mobility in soil

Not applicable. BOS is an inorganic solid material of natural origin.

12.5 Results of PBT and vPvB assessment:

PBT: not applicable

vPvB: not applicable

PBT and vPvB criteria do not apply to inorganic substances. No bioconcentration in organisms is to be expected.

12.6 Other adverse effects

no data
13. Considerations about disposal

13.1 Waste treatment methods
Dry BOS may always be reused and is therefore no waste. Thus, waste treatment methods do not apply. In case of a spill, collect carefully under dry conditions for re-use as described in section 6.3.
Never flush into sewage systems or surface waters.
Moist or wet BOS or slurries of it in water should be allowed to harden on a suitable ground and then be disposed of as concrete waste. Waste code is 10 13 14 (waste concrete and concrete sludge).

14. Transport information

BOS is not covered by the international regulations on the transport of dangerous goods (IMDG, IATA, ADR/RID); no classification is required

14.1 UN number
None

14.2 UN proper shipping name
Not relevant for all routes of transportation

14.3 Transportation hazard class and label
Not relevant for all routes of transportation

14.4 Packing group
Not relevant for all routes of transportation

14.5 Environmental hazards
Not relevant for all routes of transportation

14.6 Special precautions for user
Not relevant for all routes of transportation

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
Not relevant for all routes of transportation

15. Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance

Specific EU legislation
Regulation (EC) 1907/2006 (REACH regulation) registered substance
Authorisation according to title VII of the REACH regulation (EC) No 1907/2006: not subject to authorisation
Restrictions according to title VIII of the REACH regulation (EC) No 1907/2006: no restriction
Regulation (EC) No 2037/2000 (substances that deplete the ozone layer): not applicable
Regulation (EC) No 850/2004 (persistent organic pollutants): not applicable
Regulation (EC) No 689/2008 (exportation and importation of dangerous chemicals): not applicable
Directive 2002/95/EC ("RoHS-directive", substances of the RoHS list) not applicable
Machines directive 2006/42/EC (section on personal protective equipment) (see section 8.2.2)
Directive 89/686/EEC (on EN standards for personal protective equipment) (see section 8.2.2)

16. Other information

16.1 Abbreviations and acronyms
AC Article Category
ADR European Agreement concerning the International Carriage of Dangerous Goods by Road
BOS Burnt Oil Shale
CAS Chemical Abstracts Service
DNEL Derived no-effect level
EC European Community
EC50 Effect concentration, 50 % (Effect: e.g. immobilisation of water flea)
EN European standard
EU European Union
GHS Globally Harmonised System
IATA International Air Transport Association
IATA-DGR International Air Transport Association Dangerous Goods Regulations
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBC-Code</td>
<td>International Code for construction and equipment of ships carrying dangerous chemicals in bulk</td>
</tr>
<tr>
<td>ICAO-TI</td>
<td>International Civil Aviation Organization-Technical Instructions</td>
</tr>
<tr>
<td>IMDG-Code</td>
<td>International Maritime Code for Dangerous Goods</td>
</tr>
<tr>
<td>ISO</td>
<td>Norme de la &quot;International Standards Organization&quot;</td>
</tr>
<tr>
<td>IUCLID</td>
<td>International Uniform Chemical Information Database</td>
</tr>
<tr>
<td>LC50</td>
<td>Lethal concentration, 50%</td>
</tr>
<tr>
<td>LD50</td>
<td>Lethal dose, 50%</td>
</tr>
<tr>
<td>LOAEC</td>
<td>Lowest Observable Adverse Effect Concentration</td>
</tr>
<tr>
<td>LOAEL</td>
<td>Lowest Observable Adverse Effect Level</td>
</tr>
<tr>
<td>Log Kow</td>
<td>Distribution coefficient between octanol and water</td>
</tr>
<tr>
<td>MARPOL</td>
<td>Maritime Pollution Convention = International Convention for the Prevention of Pollution from Ships</td>
</tr>
<tr>
<td>MSDS</td>
<td>Material Safety Data Sheet</td>
</tr>
<tr>
<td>NOEC</td>
<td>No Observed Effect Concentration</td>
</tr>
<tr>
<td>NOEL</td>
<td>No Observed Effect Level</td>
</tr>
<tr>
<td>OECD</td>
<td>Organisation for Economic Cooperation and Development</td>
</tr>
<tr>
<td>PBT</td>
<td>Persistent, bioaccumulative and toxic</td>
</tr>
<tr>
<td>PNEC</td>
<td>Predicted no-effect concentration</td>
</tr>
<tr>
<td>RID</td>
<td>Regulations concerning the International Carriage of Dangerous Goods by Rail</td>
</tr>
<tr>
<td>STOT</td>
<td>Specific target organ toxicity</td>
</tr>
<tr>
<td>TLV</td>
<td>Threshold Level Value</td>
</tr>
<tr>
<td>UN</td>
<td>United Nations</td>
</tr>
<tr>
<td>vPvB</td>
<td>very Persistent and very Bioaccumulative</td>
</tr>
<tr>
<td>WAF</td>
<td>Water Accommodated Fraction</td>
</tr>
</tbody>
</table>
## Annex 1 Identified uses

### Annex 1.1 Use by workers in industrial settings

<table>
<thead>
<tr>
<th>Identified Use (IU) No. and name</th>
<th>Substance supplied to that use</th>
<th>Use descriptors</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Production and filling of BOS</td>
<td>as such (substance itself)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Process category (PROC):</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>PROC3: Use in closed batch process (synthesis or formulation)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PROC4: Use in batch and other process (synthesis) where opportunity for exposure arises</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Environmental release category (ERC):</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>ERC1: Manufacture of substances</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Sector of end use (SU):</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>SU8: Manufacture of bulk, large scale chemicals (including petroleum products)</td>
</tr>
<tr>
<td>Subsequent service life relevant for that use:</td>
<td>no</td>
<td></td>
</tr>
<tr>
<td>2 Formulation of BOS into construction materials (cement, clinker)</td>
<td>as such (substance itself)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Process category (PROC):</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>PROC3: Use in closed batch process (synthesis or formulation)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PROC5: Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PROC9: Transfer of substance or preparation into small containers (dedicated filling line, including weighing)</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Environmental release category (ERC):</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>ERC2: Formulation of preparations</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Sector of end use (SU):</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>SU13: Manufacture of other non-metallic mineral products, e.g. plasters, cement</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SU10: Formulation [mixing] of preparations and/or re-packaging (excluding alloys)</td>
</tr>
<tr>
<td>Subsequent service life relevant for that use:</td>
<td>no</td>
<td></td>
</tr>
</tbody>
</table>
### Annex 1.1 Use by workers in industrial settings (continued)

<table>
<thead>
<tr>
<th>Identified Use (IU) No. and name</th>
<th>Substance supplied to that use</th>
<th>Use descriptors</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 Industrial use of BOS-containing construction materials</td>
<td>in a mixture</td>
<td>Process category (PROC): PROC8b: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Environmental release category (ERC): ERC5: Industrial use resulting in inclusion into or onto a matrix</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sector of end use (SU): SU0: Other: NACE C23.6.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Subsequent service life relevant for that use?: yes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Article category related to subsequent service life (AC): AC4: Stone, plaster, cement, glass and ceramic articles</td>
</tr>
</tbody>
</table>

| 7 Use as fuel component | as such (substance itself) | Process category (PROC): PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities |
| | | Market sector by type of chemical product: PC13: Fuels |
| | | Environmental release category (ERC): ERC5: Industrial use resulting in inclusion into or onto a matrix |
| | | Sector of end use (SU): SU0: Other |
| | | SU3: Industrial uses: Uses of substances as such or in preparations at industrial sites |
| | | Subsequent service life relevant for that use: no |

### Annex 1.2 Uses by professional workers

<table>
<thead>
<tr>
<th>Identified Use (IU) No. and name</th>
<th>Substance supplied to that use</th>
<th>Use descriptors</th>
</tr>
</thead>
</table>

Page 13 / 15
<table>
<thead>
<tr>
<th>4 Professional Use of BOS-containing construction materials</th>
<th>in a mixture</th>
</tr>
</thead>
</table>

**Process category (PROC):**
PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities

**Environmental release category (ERC):**
ERC8c: Wide dispersive indoor use resulting in inclusion into or onto a matrix
ERC8f: Wide dispersive outdoor use resulting in inclusion into or onto a matrix

**Sector of end use (SU):**
SU19: Building and construction work

**Subsequent service life relevant for that use:** no
### Annex 1.2 Uses by professional workers (continued)

<table>
<thead>
<tr>
<th>Identified Use (IU) No. and name</th>
<th>Substance supplied to that use</th>
<th>Use descriptors</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 Professional use in bound applications (binder, soil stabilizer, subgrade stabilisation)</td>
<td>as such (substance itself) and in a mixture</td>
<td>Process category (PROC): PROC8a: Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Market sector by type of chemical product:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PC12: Fertilisers</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PC2: Adsorbents</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PC0: Other: UCN S60000: Stabilizer</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Environmental release category (ERC):</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ERC8c: Wide dispersive indoor use resulting in inclusion into or onto a matrix</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ERC8f: Wide dispersive outdoor use resulting in inclusion into or onto a matrix</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sector of end use (SU):</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SU0: Other</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SU22: Professional uses: Public domain</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Subsequent service life relevant for that use: no</td>
</tr>
</tbody>
</table>

### Annex 1.3 Consumer uses SU21

<table>
<thead>
<tr>
<th>Identified Use (IU) No. and name</th>
<th>Use descriptors</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 Consumer Use of BOS-containing construction materials</td>
<td>Chemical product category (PC): PC9b: Fillers, putties, plasters, modelling clay</td>
</tr>
<tr>
<td></td>
<td>Environmental release category (ERC):</td>
</tr>
<tr>
<td></td>
<td>ERC8c: Wide dispersive indoor use resulting in inclusion into or onto a matrix</td>
</tr>
<tr>
<td></td>
<td>ERC8f: Wide dispersive outdoor use resulting in inclusion into or onto a matrix</td>
</tr>
<tr>
<td></td>
<td>Subsequent service life relevant for that use: yes</td>
</tr>
</tbody>
</table>