# NETL Life Cycle Inventory Data
# Process Documentation File

**Process Name:** Natural Gas, Average Barnett Shale, Extraction

**Reference Flow:** 1 kg of Natural Gas

**Brief Description:** This process includes all inputs for the raw material acquisition 1 kg of natural gas via average Barnett shale extraction

## Section I: Meta Data

**Geographical Coverage:** US **Region:** N/A

**Year Data Best Represents:** 2009

**Process Type:** Extraction Process (EP)

**Process Scope:** Cradle-to-Gate Process (CG)

**Allocation Applied:** No

**Completeness:** Individual Relevant Flows Captured

**Flows Aggregated in Data Set:**

☒ Process ☒ Energy Use ☒ Energy P&D ☐ Material P&D

**Relevant Output Flows Included in Data Set:**

| | | | |
|---|---|---|---|
| Releases to Air: | ☒ Greenhouse Gases | ☒ Criteria Air Pollutants | ☐ Other |
| Releases to Water: | ☒ Inorganic Emissions | ☐ Organic Emissions | ☐ Other |
| Water Usage: | ☒ Water Consumption | ☒ Water Demand (throughput) | |
| Releases to Soil: | ☒ Inorganic Releases | ☐ Organic Releases | ☐ Other |

**Adjustable Process Parameters:**

| | |
|---|---|
| Product_rate | *The production rate of natural gas via the specified extraction method* |

**Tracked Input Flows:**

| | |
|---|---|
| Natural Gas from Barnett shale | *The quantity of unprocessed natural gas from specified extraction method* |

**Tracked Output Flows:**

| | |
|---|---|
| Natural Gas from Barnett shale | *The quantity of processed natural gas from specified extraction method* |

## Section II: Process Description

### Associated Documentation

This unit process is composed of this document and the data sheet (DS) *DS_RMA_NaturalGas_BarnettShale_Average_2011.02.xls*, which provides additional details regarding relevant calculations, data quality, and references.

### Goal and Scope

The scope of this unit process covers all aspects of raw material acquisition (RMA) and as seen in **Figure 1**. At the RMA downstream boundary, one kilogram of natural gas is delivered to the life cycle (LC) Stage #2 boundary for raw material transportation (RMT).

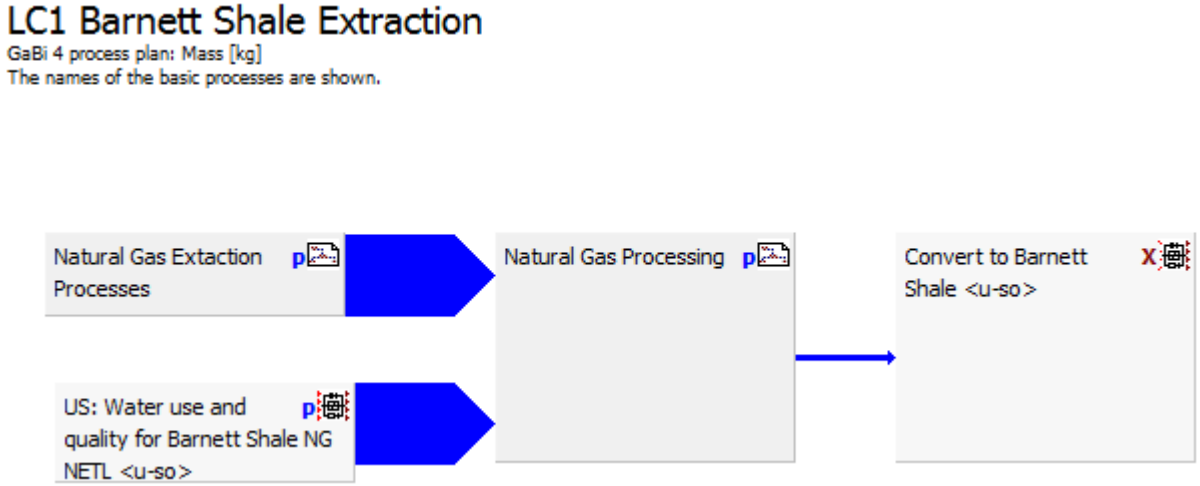
### Boundary and Description

LC Stage #1, RMA of this unit process includes the acquisition of natural gas by average Barnett shale extraction in 2009. The natural gas is processed in preparation for RMT in LC Stage #2.

Construction of the wells and pipelines are included. The upstream profiles for concrete and steel are rolled up into this process.

An example plan is provided in **Figure 1**. Overall plans for extraction and processes were created.

**Figure 1: Plan for RMA of Average Barnett Shale Natural Gas**




The construction processes for both machinery and facilities were created with the only viable one being:

- Natural Gas Well Construction and Installation
  (DS/DF_Stage1_C_Natural_Gas_Well_Generic_2011.01.doc)

Each piece of equipment or facility is scaled to the production of one kilogram of natural gas. The profiles and processes included in RMA are provided in **Table 1**. Those shown in bold face were developed by NETL.

**Table 1: Profiles and Processes Included in RMA for Average Barnett Shale Natural Gas**

LC1 Barnett Shale Extraction

- Natural Gas Extraction Processes
  - Natural Gas Extraction Assembly <u-so>
  - Natural Gas Extraction, Pneumatic Venting <u-so>
  - US: Concrete, ready mixed, R-5-0 (100% Portland Cement) NETL <u-so>
  - US: DIESEL, NATIONAL AVERAGE, 2009 NETL <u-so>
  - US: Natural Gas Extraction, Other Venting Fugitives NETL <u-so>
  - US: Natural Gas Extraction, Other Venting Point Sources NETL <u-so>
  - US: Natural Gas Well Completion NETL <u-so>
  - US: Natural Gas Well Construction and Installation NETL <u-so>
  - US: NG Well Liquid Unloading NETL <u-so>
  - US: North American Average Electricity Mix, 2007 080811 NETL
  - US: Unconventional NG Well Workovers NETL <u-so>
  - V&F: Liquid Unloading
  - V&F: Other Venting Ext
  - V&F: Well Completion
  - V&F: Workovers
  - WOR: Steel Pipe, Welded, BF, Manufacture NETL <u-so>
- Natural Gas Processing
  - Natio: Natural gas sweetening <u-so>
  - Natural Gas Processing, Pneumatic Venting <u-so>
  - US: Assembly of Natural Gas Compression NETL <u-so>
  - US: Diethanolamine (DEA) PE
  - US: Natural gas dehydration NETL <u-so>
  - US: Natural Gas Processing, Other Venting Fugitives NETL <u-so>
  - US: Natural Gas Processing, Other Venting Point Sources NETL <u-so>
  - US: North American Average Electricity Mix, 2007 080811 NETL
  - US: Wellhead Electrically-Powered Centrifugal Compressor NETL <u-so>
  - US: Wellhead Gas-Powered Centrifugal Compressor NETL <u-so>
  - US: Wellhead Reciprocating Compressor NETL <u-so>
  - V&F: Dehydration
  - V&F: Electrical Centrifugal Compression
  - V&F: Gas Centrifugal Compression
  - V&F: Other Venting, Point Source
  - V&F: Sweetening
- Convert to Barnett Shale <u-so>
- US: Water use and quality for Barnett Shale NG NETL <u-so>

## Parameters and Balances

The parameters for the highest level modeling plans for RMA of average Barnett shale natural gas are shown in **Table 2**. These parameters may or may not include the adjustable parameters shown previously, depending on how the model was created. **Table 3** presents the input and output balances for resources and emissions of interest for the RMA plan.

**Table 2: Adjustable Parameters for RMA of Average Barnett Shale Natural Gas**

| Plan | Parameter | Value | Comment |
|---|---|---|---|
| *LC Stage #1* | | | |
| RMA: Average Barnett Shale Natural Gas | Product_rate | 5219 | [kg/day] Adjustable Parameter; production rate |

**Table 3: Inputs and Output Balances for RMA of Average Barnett Shale Natural Gas (kg/kg delivered)**

| Process or Category | Cradle to Gate (RMA) |
|---|---|
| Inputs | |
| Flows | 3.772E+00 |
| Resources | 3.772E+00 |
| Energy resources | 1.128E+00 |
| Non renewable energy resources | 1.128E+00 |
| Crude oil (resource) | 5.095E-04 |
| Crude oil | 1.252E-04 |
| Crude oil Algeria | 4.044E-06 |
| Crude oil Angola | 1.142E-05 |
| Crude oil Argentina | 1.287E-06 |
| Crude oil Australia | 8.161E-07 |
| Crude oil Austria | 8.662E-09 |
| Crude oil Bolivia | 2.141E-12 |
| Crude oil Brazil | 1.091E-06 |
| Crude oil Brunei | 3.676E-13 |
| Crude oil Bulgaria | 3.852E-12 |
| Crude oil Cameroon | 2.332E-07 |
| Crude oil Canada | 3.219E-05 |
| Crude oil Central Africa | 0.000E+00 |
| Crude oil Central America | 0.000E+00 |
| Crude oil Chile | 9.850E-12 |

| Process or Category | Cradle to Gate (RMA) |
|---|---|
| Crude oil China | 3.276E-07 |
| Crude oil CIS | 3.128E-06 |
| Crude oil Colombia | 4.208E-06 |
| Crude oil Czech Republic | 1.264E-09 |
| Crude oil Denmark | 3.535E-07 |
| Crude oil Ecuador | 4.393E-06 |
| Crude oil Egypt | 3.138E-08 |
| Crude oil France | 1.054E-08 |
| Crude oil Gabon | 2.999E-06 |
| Crude oil Germany | 8.255E-08 |
| Crude oil Greece | 1.513E-09 |
| Crude oil Hungary | 1.726E-09 |
| Crude oil India | 2.131E-11 |
| Crude oil Indonesia | 8.432E-07 |
| Crude oil Iran | 2.512E-07 |
| Crude oil Iraq | 1.432E-05 |
| Crude oil Ireland | 1.076E-13 |
| Crude oil Italy | 4.929E-08 |
| Crude oil Kuwait | 6.174E-06 |
| Crude oil Libya | 4.565E-07 |
| Crude oil Malaysia | 2.055E-13 |
| Crude oil Mexico | 4.095E-05 |
| Crude oil Middle East | 0.000E+00 |
| Crude oil Netherlands | 3.844E-08 |
| Crude oil New Zealand | 2.212E-09 |
| Crude oil Nigeria | 2.129E-05 |
| Crude oil North Africa | 0.000E+00 |
| Crude oil Norway | 7.652E-06 |
| Crude oil Oman | 2.788E-07 |
| Crude oil Poland | 4.029E-09 |
| Crude oil Qatar | 1.532E-07 |
| Crude oil Romania | 3.561E-09 |
| Crude oil Saudi Arabia | 3.991E-05 |
| Crude oil Slovakia | 1.061E-11 |
| Crude oil South Africa | 1.661E-13 |
| Crude oil Spain | 2.353E-09 |

| Process or Category | Cradle to Gate (RMA) |
|---|---|
| Crude oil Syria | 1.996E-11 |
| Crude oil Trinidad and Tobago | 1.134E-06 |
| Crude oil Tunisia | 1.683E-08 |
| Crude oil Turkey | 2.221E-15 |
| Crude oil United Arab Emirates | 1.556E-07 |
| Crude oil United Kingdom | 8.230E-06 |
| Crude oil USA | 1.375E-04 |
| Crude oil Venezuela | 3.831E-05 |
| Hard coal (resource) | 1.029E-02 |
| Hard coal | 9.118E-09 |
| Hard Coal (Illinois No 6) | 9.441E-03 |
| Hard coal Australia | 3.620E-07 |
| Hard coal Belgium | 3.081E-10 |
| Hard coal Bosnia and Herzegovina | 3.119E-08 |
| Hard coal Brazil | 4.351E-09 |
| Hard coal Canada | 6.625E-07 |
| Hard coal Chile | 1.035E-09 |
| Hard coal China | 4.306E-08 |
| Hard coal CIS | 1.683E-07 |
| Hard coal Colombia | 8.411E-07 |
| Hard coal Czech Republic | 4.087E-08 |
| Hard coal France | 7.106E-09 |
| Hard coal Germany | 8.722E-07 |
| Hard coal India | 1.583E-09 |
| Hard coal Indonesia | 1.765E-07 |
| Hard coal Italy | 2.173E-10 |
| Hard coal Japan | 2.704E-14 |
| Hard coal Malaysia | 8.697E-15 |
| Hard coal Mexico | 2.744E-08 |
| Hard coal New Zealand | 8.408E-10 |
| Hard coal Poland | 2.460E-07 |
| Hard coal Portugal | 1.145E-12 |
| Hard coal South Africa | 3.612E-07 |
| Hard coal Spain | 2.379E-08 |
| Hard coal Turkey | 9.568E-12 |
| Hard coal United Kingdom | 7.414E-08 |

| Process or Category | Cradle to Gate (RMA) |
|---|---|
| Hard coal USA | 8.455E-04 |
| Hard coal Venezuela | 2.819E-07 |
| Hard coal Vietnam | 3.604E-09 |
| Hard Coal, Pure, Fuel | 8.764E-08 |
| Hard Coal, Raw, Fuel | 6.862E-07 |
| Lignite (resource) | 6.210E-06 |
| Lignite | 7.415E-09 |
| Lignite Australia | 3.912E-08 |
| Lignite Austria | 1.271E-09 |
| Lignite Bosnia and Herzegovina | 7.205E-08 |
| Lignite Bulgaria | 7.254E-09 |
| Lignite Canada | 1.205E-07 |
| Lignite CIS | 8.863E-09 |
| Lignite Czech Republic | 3.549E-08 |
| Lignite France | 2.384E-09 |
| Lignite Germany | 2.026E-10 |
| Lignite Germany (Central Germany) | 1.889E-06 |
| Lignite Germany (Lausitz) | 6.202E-07 |
| Lignite Germany (Rheinisch) | 1.123E-06 |
| Lignite Greece | 2.750E-07 |
| Lignite Hungary | 4.509E-09 |
| Lignite India | 3.166E-10 |
| Lignite Macedonia | 4.856E-09 |
| Lignite Poland | 2.696E-08 |
| Lignite Romania | 1.268E-10 |
| Lignite Serbia and Montenegro | 4.997E-09 |
| Lignite Slovakia | 1.218E-08 |
| Lignite Slovenia | 8.267E-08 |
| Lignite Spain | 5.007E-08 |
| Lignite Turkey | 2.753E-13 |
| Lignite USA | 1.822E-06 |
| Natural gas (resource) | 1.117E+00 |
| Natural gas | 2.162E-08 |
| Natural gas Algeria | 5.200E-07 |
| Natural gas Angola | 1.423E-06 |
| Natural gas Argentina | 1.218E-07 |

| Process or Category | Cradle to Gate (RMA) |
|---|---|
| Natural gas Australia | 5.508E-08 |
| Natural gas Austria | 2.392E-09 |
| Natural gas Bolivia | 4.304E-09 |
| Natural gas Brazil | 1.259E-07 |
| Natural gas Brunei | 3.231E-09 |
| Natural gas Bulgaria | 1.407E-12 |
| Natural gas Cameroon | 5.822E-08 |
| Natural gas Canada | 8.239E-06 |
| Natural gas Chile | 2.321E-09 |
| Natural gas China | 3.468E-08 |
| Natural gas CIS | 1.036E-06 |
| Natural gas Colombia | 4.242E-07 |
| Natural gas Czech Republic | 2.146E-10 |
| Natural gas Denmark | 7.726E-08 |
| Natural gas Ecuador | 3.505E-07 |
| Natural gas Egypt | 2.937E-09 |
| Natural gas France | 1.473E-08 |
| Natural gas Gabon | 4.412E-07 |
| Natural gas Germany | 5.005E-07 |
| Natural gas Greece | 2.230E-10 |
| Natural gas Hungary | 2.324E-09 |
| Natural gas India | 1.213E-10 |
| Natural gas Indonesia | 4.353E-08 |
| Natural gas Iran | 2.693E-08 |
| Natural gas Iraq | 1.017E-06 |
| Natural gas Ireland | 2.467E-10 |
| Natural gas Italy | 3.367E-08 |
| Natural gas Japan | 7.743E-15 |
| Natural gas Kuwait | 4.190E-07 |
| Natural gas Libyan | 1.618E-08 |
| Natural gas Malaysia | 3.118E-09 |
| Natural gas Mexico | 3.493E-06 |
| Natural gas Netherlands | 7.676E-07 |
| Natural gas New Zealand | 1.416E-10 |
| Natural gas Nigeria | 3.875E-06 |
| Natural gas Norway | 7.704E-07 |

| Process or Category | Cradle to Gate (RMA) |
|---|---|
| Natural gas Oman | 3.258E-08 |
| Natural gas Poland | 1.637E-09 |
| Natural gas Qatar | 6.328E-08 |
| Natural gas Romania | 2.193E-10 |
| Natural gas Saudi Arabia | 2.714E-06 |
| Natural gas Slovakia | 2.438E-10 |
| Natural gas South Africa | 1.531E-11 |
| Natural gas Spain | 7.181E-10 |
| Natural gas Syria | 2.145E-12 |
| Natural gas Trinidad and Tobago | 3.732E-07 |
| Natural gas Tunisia | 2.045E-09 |
| Natural gas Turkey | 2.246E-16 |
| Natural gas United Arab Emirates | 1.516E-08 |
| Natural gas United Kingdom | 7.512E-07 |
| Natural gas USA | 1.966E-02 |
| Natural gas Venezuela | 2.815E-06 |
| Natural Gas, Fuel | 2.737E-07 |
| Natural gas, Raw Material | 1.098E+00 |
| Pit gas | 2.979E-12 |
| Pit Methane | 3.140E-07 |
| Uranium (resource) | 7.711E-10 |
| Nuclear energy | 0.000E+00 |
| Uranium natural | 7.711E-10 |
| Renewable energy resources | 5.460E-08 |
| Biomass | 3.729E-09 |
| Energy, gross calorific value, in biomass, primary forest | 0.000E+00 |
| Primary energy from geothermics | 0.000E+00 |
| Primary energy from hydro power | 0.000E+00 |
| Primary energy from solar energy | 0.000E+00 |
| Primary energy from waves | 0.000E+00 |
| Primary energy from wind power | 0.000E+00 |
| Renewable fuels | 1.157E-13 |
| Wood | 5.088E-08 |
| Unspecified | 0.000E+00 |
| Energy unspecified (APME) | 0.000E+00 |
| Land use | 0.000E+00 |

| Process or Category | Cradle to Gate (RMA) |
|---|---|
| Hemerobie ecoinvent | 0.000E+00 |
| Transformation, from unknown | 0.000E+00 |
| Transformation, to mineral extraction site | 0.000E+00 |
| Occupation | 0.000E+00 |
| Biotic Production | 0.000E+00 |
| Erosion Resistance | 0.000E+00 |
| Groundwater Replenishment | 0.000E+00 |
| Mechanical Filtration | 0.000E+00 |
| Physicochemical Filtration | 0.000E+00 |
| Transformation | 0.000E+00 |
| Biotic Production | 0.000E+00 |
| Erosion Resistance | 0.000E+00 |
| Groundwater Replenishment | 0.000E+00 |
| Mechanical Filtration | 0.000E+00 |
| Physicochemical Filtration | 0.000E+00 |
| Material resources | 2.644E+00 |
| Non renewable elements | 1.273E-03 |
| Aluminum | 2.773E-10 |
| Chromium | 1.480E-13 |
| Copper | 2.987E-13 |
| Iron | 1.266E-03 |
| Lead | 7.722E-14 |
| Magnesium | 1.649E-16 |
| Mercury | 4.918E-14 |
| Nickel | 6.456E-16 |
| Phosphorus | 1.648E-11 |
| Sulphur | 7.780E-11 |
| Zinc | 7.049E-06 |
| Non renewable resources | 8.737E-04 |
| Barium sulphate | 8.739E-18 |
| Basalt | 8.175E-08 |
| Bauxite | 2.727E-06 |
| Bentonite | 1.764E-06 |
| Calcium carbonate (CaCO3) | 1.805E-06 |
| Calcium chloride | 8.947E-16 |
| Chalk (Calciumcarbonate) | 9.539E-40 |

| Process or Category | Cradle to Gate (RMA) |
|---|---|
| Chromium ore (39%) | 7.003E-08 |
| Clay | 5.937E-07 |
| Colemanite ore | 1.064E-08 |
| Copper - Gold - Silver - ore (1,0% Cu; 0,4 g/t Au; 66 g/t Ag) | 9.194E-07 |
| Copper - Gold - Silver - ore (1,1% Cu; 0,01 g/t Au; 2,86 g/t Ag) | 5.601E-07 |
| Copper - Gold - Silver - ore (1,16% Cu; 0,002 g/t Au; 1,06 g/t Ag) | 3.161E-07 |
| Copper - Molybdenum - Gold - Silver - ore (1,13% Cu; 0,02% Mo; 0,01 g/t Au; 2,86 g/t Ag) | 1.421E-07 |
| Copper ore (0.14%) | 1.990E-06 |
| Copper ore (1.2%) | 9.534E-08 |
| Copper ore (4%) | 8.671E-18 |
| Copper ore (sulphidic, 1.1%) | 1.238E-07 |
| Dolomite | 6.829E-05 |
| Feldspar (aluminum silicates) | 1.162E-11 |
| Ferro manganese | 2.685E-14 |
| Fluorspar (calcium fluoride; fluorite) | 2.050E-08 |
| Granite | 3.605E-21 |
| Gravel | 9.916E-06 |
| Gypsum (natural gypsum) | 3.829E-07 |
| Heavy spar (BaSO4) | 4.227E-06 |
| Ilmenite (titanium ore) | 1.841E-11 |
| Inert rock | 5.279E-04 |
| Iron ore (56,86%) | 3.679E-06 |
| Iron ore (65%) | 2.283E-09 |
| Kaolin ore | 1.911E-08 |
| Lead - zinc ore (4.6%-0.6%) | 3.746E-07 |
| Limestone (calcium carbonate) | 1.650E-04 |
| Magnesit (Magnesium carbonate) | 1.038E-11 |
| Magnesium chloride leach (40%) | 6.064E-08 |
| Manganese ore | 1.368E-08 |
| Manganese ore (R.O.M.) | 6.463E-08 |
| Molybdenite (Mo 0,24%) | 8.678E-08 |
| Molybdenum ore (0.1%) | 1.292E-09 |
| Natural Aggregate | 6.400E-05 |
| Nickel ore (1,5%) | 2.188E-09 |
| Nickel ore (1.6%) | 1.668E-07 |
| Olivine | 2.798E-13 |

| Process or Category | Cradle to Gate (RMA) |
|---|---|
| Peat | 5.755E-09 |
| Phosphate ore | 3.515E-12 |
| Phosphorus minerals | 1.759E-10 |
| Phosphorus ore (29% P2O5) | 2.664E-12 |
| Potassium chloride | 2.101E-10 |
| Precious metal ore (R.O.M) | 3.509E-09 |
| Quartz sand (silica sand; silicon dioxide) | 1.403E-06 |
| Raw pumice | 1.853E-09 |
| Rutile (titanium ore) | 3.885E-13 |
| sand | 3.982E-11 |
| Slate | 5.071E-13 |
| Sodium chloride (rock salt) | 4.379E-06 |
| Sodium nitrate | 5.212E-20 |
| Sodium sulphate | 3.567E-12 |
| Soil | 1.181E-05 |
| Sulphur (bonded) | 1.819E-13 |
| Talc | 3.221E-10 |
| Tin ore | 7.578E-19 |
| Titanium ore | 3.488E-08 |
| Zinc - copper ore (4.07%-2.59%) | 3.769E-07 |
| Zinc - lead - copper ore (12%-3%-2%) | 2.512E-07 |
| Zinc - lead ore (4.21%-4.96%) | 2.961E-18 |
| Zinc ore (4%) | -8.275E-09 |
| Zinc ore (sulphidic, 4%) | 4.178E-17 |
| Renewable resources | 2.642E+00 |
| Water | 2.637E+00 |
| Water | 8.469E-04 |
| Water (feed water) | 0.000E+00 |
| Water (ground water) | 9.579E-01 |
| Water (lake water) | 9.066E-06 |
| Water (municipal) | 8.079E-06 |
| Water (sea water) | 3.740E-06 |
| Water (surface water) | 1.674E+00 |
| Water (wastewater) | 0.000E+00 |
| Water (well water) | 1.187E-07 |
| Water (well-produced water) | 4.009E-03 |

| Process or Category | Cradle to Gate (RMA) |
|---|---|
| Water (with river silt) | 4.774E-17 |
| Water,turbine use, unspecified natural origin | 0.000E+00 |
| Air | 5.144E-03 |
| Carbon dioxide | 9.264E-07 |
| Nitrogen | 3.109E-09 |
| Oxygen | 0.000E+00 |
| Unspecified | 7.957E-08 |
| Unspecified minerals | 1.810E-08 |
| Unspecified resources | 6.147E-08 |
| Output | |
| Flows | 1.600E+00 |
| Resources | 1.422E+00 |
| Energy resources | 0.000E+00 |
| Non renewable energy resources | 0.000E+00 |
| Natural gas (resource) | 0.000E+00 |
| Natural gas USA | 0.000E+00 |
| Natural gas, Raw Material | 0.000E+00 |
| Non Renewable Energy | 0.000E+00 |
| Renewable energy resources | 0.000E+00 |
| Feedstock Energy | 0.000E+00 |
| Renewable Energy | 0.000E+00 |
| Total Primary Energy | 0.000E+00 |
| Land use | 0.000E+00 |
| Hemeroby | 0.000E+00 |
| Occup. as Forest land | 0.000E+00 |
| Material resources | 1.422E+00 |
| Renewable resources | 1.422E+00 |
| Water | 1.422E+00 |
| Water (feed water) | 1.815E-05 |
| Water (river water) | 1.035E+00 |
| Water (wastewater) | 3.694E-01 |
| Water (wastewater) | 1.779E-02 |
| Nitrogen | 0.000E+00 |
| Oxygen | 8.229E-08 |
| Ecoinvent | 2.125E-05 |
| Long-term emission | 2.125E-05 |

| Process or Category | Cradle to Gate (RMA) |
|---|---|
| Fresh water | 2.125E-05 |
| Chloride | 2.125E-05 |
| Dissolved organic carbon, DOC (Ecoinvent) | 3.288E-12 |
| Total organic carbon, TOC (Ecoinvent) | 0.000E+00 |
| Production residues in life cycle | 3.299E-06 |
| Hazardous waste for disposal | 7.616E-07 |
| Chromium containing slag | 1.284E-10 |
| Dross (Fines) | 5.016E-09 |
| Natrium oxide | 8.528E-09 |
| Red mud (dry) | 7.409E-07 |
| Soil and sand containing heavy metals | 6.241E-09 |
| Toxic chemicals (unspecified) | 7.488E-10 |
| Hazardous waste for recovery | 1.317E-07 |
| Used oil | 1.349E-09 |
| Waste water processing residue | 1.303E-07 |
| Waste for disposal | 2.130E-06 |
| Incineration good | 4.270E-10 |
| Sludge from water works (6% dry matter-content) | 2.368E-09 |
| Waste (solid) | 5.737E-07 |
| Waste for disposal (unspecified) | 1.259E-09 |
| Waste from steel works | 1.552E-06 |
| Waste for recovery | 1.743E-07 |
| Aluminum scrap | 1.512E-15 |
| Boiler ash (unspecified) | 0.000E+00 |
| Chemicals (unspecified) | 2.112E-10 |
| Cooling water | 7.195E-08 |
| Cryolite | 2.339E-09 |
| Dross | 2.259E-10 |
| Filter dust | 2.039E-11 |
| Fly ash (unspecified) | 0.000E+00 |
| Furnace clinker | 5.097E-12 |
| Gypsum | 0.000E+00 |
| Gypsum (contaminated) | 8.130E-16 |
| Gypsum (FDI) | 1.626E-11 |
| Plastic (unspecified) | 4.416E-10 |
| Production residues (unspecified) | 5.160E-12 |

| Process or Category | Cradle to Gate (RMA) |
|---|---|
| Rolling gravel | 1.348E-09 |
| Rolling tinder | 2.854E-12 |
| Slag | 3.281E-08 |
| Slag (containing precious metal) | 1.885E-12 |
| Slag (Iron plate production) | 4.272E-08 |
| Slag (Mn 6,5%) | 2.218E-08 |
| Waste paper | 2.905E-12 |
| Wood | 3.024E-12 |
| Wooden pallet (EURO) | 1.239E-18 |
| Mixed Waste (Hazardous or Radioactive) | 1.019E-07 |
| Neutralized residues | 2.965E-12 |
| Emissions to air | 1.703E-01 |
| Heavy metals to air | 6.047E-08 |
| Antimony | 2.386E-12 |
| Arsenic (+V) | 1.118E-10 |
| Arsenic trioxide | 2.452E-16 |
| Cadmium (+II) | 2.514E-10 |
| Chromium (+III) | 2.961E-13 |
| Chromium (+VI) | 2.899E-15 |
| Chromium (unspecified) | 1.477E-09 |
| Cobalt | 1.602E-11 |
| Copper (+II) | 3.051E-11 |
| Heavy metals to air (unspecified) | 4.199E-12 |
| Hydrogen arsenic (arsine) | 2.035E-14 |
| Iron | 2.962E-11 |
| Lanthanides | 1.144E-15 |
| Lead (+II) | 9.452E-09 |
| Manganese (+II) | 3.375E-11 |
| Mercury (+II) | 8.497E-10 |
| Molybdenum | 2.836E-12 |
| Nickel (+II) | 3.554E-10 |
| Palladium | 2.477E-20 |
| Rhodium | 2.391E-20 |
| Selenium | 6.656E-11 |
| Silver | 2.314E-18 |
| Tellurium | 3.943E-14 |

| Process or Category | Cradle to Gate (RMA) |
|---|---|
| Thallium | 3.036E-13 |
| Tin (+IV) | 2.477E-11 |
| Titanium | 7.248E-14 |
| Vanadium (+III) | 3.267E-09 |
| Zinc (+II) | 4.449E-08 |
| Inorganic emissions to air | 1.467E-01 |
| Ammonia | 2.588E-08 |
| Ammonium | 3.296E-13 |
| Ammonium nitrate | 1.066E-15 |
| Argon | 5.460E-12 |
| Barium | 2.703E-09 |
| Beryllium | 2.677E-12 |
| Boron compounds (unspecified) | 4.552E-10 |
| Bromine | 1.921E-10 |
| Carbon dioxide | 1.412E-01 |
| Carbon dioxide (biotic) | 4.990E-07 |
| Carbon dioxide (biotic) | 3.860E-10 |
| Carbon disulphide | 3.102E-14 |
| Carbon monoxide | 2.619E-04 |
| Carbon monoxide (biotic) | 2.352E-12 |
| Chloride (unspecified) | 1.816E-10 |
| Chlorine | 7.372E-12 |
| Cyanide (unspecified) | 1.727E-11 |
| Fluoride | 4.121E-10 |
| Fluorides | 8.776E-13 |
| Fluorine | 2.714E-13 |
| Helium | 9.276E-12 |
| Hydrogen | 5.040E-10 |
| Hydrogen bromine (hydrobromic acid) | 1.106E-13 |
| Hydrogen chloride | 3.310E-07 |
| Hydrogen cyanide (prussic acid) | 2.554E-13 |
| Hydrogen fluoride | 7.593E-10 |
| Hydrogen iodide | 7.032E-17 |
| Hydrogen phosphorous | 1.847E-14 |
| Hydrogen sulphide | 1.029E-07 |
| Lead dioxide | 4.036E-12 |

| Process or Category | Cradle to Gate (RMA) |
|---|---|
| Nitrogen (atmospheric nitrogen) | 8.817E-05 |
| Nitrogen (N-compounds) | 1.068E-12 |
| Nitrogen dioxide | 6.109E-07 |
| Nitrogen monoxide | 1.028E-12 |
| Nitrogen oxides | 2.992E-03 |
| Nitrous oxide (laughing gas) | 4.201E-06 |
| Oxygen | 5.084E-07 |
| Scandium | 5.504E-16 |
| Steam | 2.036E-03 |
| Strontium | 2.173E-14 |
| Sulphur dioxide | 1.156E-04 |
| Sulphur hexafluoride | 6.837E-09 |
| sulphur oxide | 1.546E-10 |
| Sulphuric acid | 1.923E-12 |
| Tin oxide | 6.190E-16 |
| Unspecified Particles | 1.482E-07 |
| Zinc oxide | 1.238E-15 |
| Zinc sulphate | 5.098E-13 |
| Organic emissions to air (group VOC) | 1.940E-02 |
| Group NMVOC to air | 3.302E-03 |
| Group PAH to air | 5.996E-10 |
| Anthracene | 4.584E-14 |
| Benzo{a}anthracene | 2.307E-14 |
| Benzo{a}pyrene | 3.980E-10 |
| Benzo{ghi}perylene | 2.058E-14 |
| Benzofluoranthene | 4.116E-14 |
| Chrysene | 5.666E-14 |
| Dibenz(a)anthracene | 1.282E-14 |
| Indeno[1,2,3-cd]pyrene | 1.531E-14 |
| Naphthalene | 4.815E-12 |
| Phenanthrene | 1.512E-12 |
| Polycyclic aromatic hydrocarbons (PAH) | 1.950E-10 |
| Halogenated organic emissions to air | 1.126E-10 |
| Dichloroethane (ethylene dichloride) | 1.479E-13 |
| Dichloromethane (methylene chloride) | 2.740E-15 |
| Dioxins (unspec.) | -7.812E-15 |

| Process or Category | Cradle to Gate (RMA) |
|---|---|
| Halogenated hydrocarbons (unspecified) | 2.588E-13 |
| Halon (1301) | 0.000E+00 |
| Polychlorinated biphenyls (PCB unspecified) | 4.441E-14 |
| Polychlorinated dibenzo-p-dioxins (2,3,7,8 - TCDD) | 1.707E-16 |
| R 11 (trichlorofluoromethane) | 5.507E-12 |
| R 114 (dichlorotetrafluoroethane) | 5.640E-12 |
| R 116 (hexafluoroethane) | 9.126E-12 |
| R 12 (dichlorodifluoromethane) | 1.184E-12 |
| R 13 (chlorotrifluoromethane) | 7.435E-13 |
| R 22 (chlorodifluoromethane) | 1.294E-12 |
| Tetrafluoromethane | 8.703E-11 |
| Vinyl chloride (VCM; chloroethene) | 1.655E-12 |
| Acetaldehyde (Ethanal) | 1.197E-09 |
| Acetic acid | 4.771E-09 |
| Acetone (dimethylcetone) | 1.196E-09 |
| Acrolein | 3.235E-13 |
| Aldehyde (unspecified) | 2.648E-12 |
| Alkane (unspecified) | 5.766E-09 |
| Alkene (unspecified) | 1.253E-09 |
| Aromatic hydrocarbons (unspecified) | 4.766E-10 |
| Benzene | 5.447E-10 |
| Butadiene | 2.538E-13 |
| Butane | 2.856E-08 |
| Butane (n-butane) | 2.527E-10 |
| Caprolactam | 9.349E-15 |
| Cumene (isopropylbenzene) | 1.809E-19 |
| Cyclohexane (hexahydro benzene) | 5.732E-14 |
| Diethylamine | 6.430E-18 |
| Ethane | 7.810E-08 |
| Ethanol | 2.379E-09 |
| Ethene (ethylene) | 1.957E-11 |
| Ethyl benzene | 1.018E-09 |
| Fluoranthene | 1.493E-13 |
| Fluorene | 4.738E-13 |
| Formaldehyde (methanal) | 3.986E-09 |
| Heptane (isomers) | 9.525E-10 |

| Process or Category | Cradle to Gate (RMA) |
|---|---|
| Hexamethylene diamine (HMDA) | 1.493E-14 |
| Hexane (isomers) | 1.424E-09 |
| Mercaptan (unspecified) | 1.084E-11 |
| Methanethiol | 3.767E-09 |
| Methanol | 2.377E-09 |
| NMVOC (unspecified) | 3.301E-03 |
| Octane | 5.240E-10 |
| Pentane (n-pentane) | 1.060E-08 |
| Phenol (hydroxy benzene) | 3.455E-14 |
| Propane | 1.415E-07 |
| Propene (propylene) | 9.234E-11 |
| Propionic acid (propane acid) | 1.079E-14 |
| Styrene | 1.508E-16 |
| Toluene (methyl benzene) | 4.755E-10 |
| Trimethylbenzene | 6.029E-15 |
| Xylene (dimethyl benzene) | 4.256E-09 |
| Hydrocarbons (unspecified) | 1.420E-08 |
| Methane | 1.610E-02 |
| Methane (biotic) | 1.753E-08 |
| Organic chlorine compounds | 2.978E-13 |
| Unspecified Organic Compounds | 1.030E-13 |
| VOC (unspecified) | 5.748E-07 |
| Other emissions to air | 4.131E-03 |
| Aldehydes, unspecified | 5.149E-14 |
| Exhaust | 4.085E-03 |
| non used primary energy from wind power | 0.000E+00 |
| Particulate Matter, unspecified | 8.381E-09 |
| Sand (Silica) (SiO2) | 9.816E-10 |
| Unused primary energy from solar energy | 0.000E+00 |
| Used air | 4.652E-05 |
| Waste heat | 0.000E+00 |
| Particles to air | 2.476E-05 |
| Dust (PM10) | 8.146E-06 |
| Dust (PM2,5 - PM10) | 2.729E-12 |
| Dust (PM2.5) | 7.557E-08 |
| Dust (Portland cement kiln) | 1.087E-05 |

| Process or Category | Cradle to Gate (RMA) |
|---|---|
| Dust (unspecified) | 5.671E-06 |
| Metals (unspecified) | 3.379E-12 |
| Unspecified Organic Chlorine Compounds | 6.794E-13 |
| Wood (dust) | 2.285E-13 |
| Radioactive emissions to air | 7.925E-12 |
| Antimony (Sb124) | 0.000E+00 |
| Argon (Ar41) | 0.000E+00 |
| Carbon (C14) | 0.000E+00 |
| Cesium (Cs134) | 0.000E+00 |
| Cesium (Cs137) | 0.000E+00 |
| Cobalt (Co58) | 0.000E+00 |
| Cobalt (Co60) | 0.000E+00 |
| Hydrogen (H3) | 0.000E+00 |
| Iodine (I129) | 0.000E+00 |
| Iodine (I131) | 0.000E+00 |
| Krypton (Kr85) | 0.000E+00 |
| Krypton (Kr85m) | 0.000E+00 |
| Plutonium (Pu alpha) | 0.000E+00 |
| radionuclides | 0.000E+00 |
| Radon (Rn222) | 0.000E+00 |
| Uranium (total) | 7.925E-12 |
| Uranium (U234) | 0.000E+00 |
| Uranium (U235) | 0.000E+00 |
| Uranium (U238) | 0.000E+00 |
| Xenon (Xe131m) | 0.000E+00 |
| Xenon (Xe133) | 0.000E+00 |
| Xenon (Xe133m) | 0.000E+00 |
| Xenon (Xe135) | 0.000E+00 |
| Xenon (Xe135m) | 0.000E+00 |
| Xenon (Xe137) | 0.000E+00 |
| Xenon (Xe138) | 0.000E+00 |
| Unspecified Heavy Metals | 5.306E-17 |
| Emissions to fresh water | 6.673E-03 |
| Analytical measures to fresh water | 4.098E-03 |
| Adsorbable organic halogen compounds (AOX) | 4.557E-10 |
| Biological oxygen demand (BOD) | 4.718E-07 |

| Process or Category | Cradle to Gate (RMA) |
|---|---|
| Chemical oxygen demand (COD) | 1.174E-06 |
| Nitrogenous Matter (unspecified, as N) | 3.929E-08 |
| Solids (dissolved) | 1.201E-04 |
| Total Biochemical Oxygen Demand | 0.000E+00 |
| Total dissolved organic bounded carbon | 2.869E-07 |
| Total Dissolved Solids | 3.976E-03 |
| Total organic bounded carbon | 5.351E-09 |
| Total Suspended Solids | 0.000E+00 |
| Heavy metals to fresh water | 1.339E-05 |
| Aluminium | 2.223E-07 |
| Antimony | 1.969E-09 |
| Arsenic (+V) | 5.575E-08 |
| Cadmium (+II) | 7.511E-10 |
| Chromium (+III) | 6.232E-11 |
| Chromium (+VI) | 1.008E-12 |
| Chromium (unspecified) | 4.594E-08 |
| Cobalt | 6.001E-13 |
| Copper (+II) | 6.790E-08 |
| Heavy metals to water (unspecified) | 1.650E-09 |
| Iron | 2.717E-06 |
| Lead (+II) | 2.251E-08 |
| Manganese (+II) | 7.434E-08 |
| Mercury (+II) | 1.090E-10 |
| Molybdenum | 2.866E-11 |
| Nickel (+II) | 2.447E-06 |
| Selenium | 1.648E-10 |
| Silver | 1.924E-09 |
| Strontium | 2.184E-09 |
| Thallium | 8.752E-15 |
| Tin (+IV) | 2.154E-12 |
| Titanium | 2.771E-12 |
| Unspecified Substance | 4.590E-13 |
| Uranium | 6.822E-06 |
| Vanadium (+III) | 1.534E-11 |
| Zinc (+II) | 9.015E-07 |
| Inorganic emissions to fresh water | 2.535E-03 |

| Process or Category | Cradle to Gate (RMA) |
|---|---|
| Acid (calculated as H+) | 1.076E-09 |
| Acidity | 0.000E+00 |
| Aluminum (+III) | 1.622E-08 |
| Ammonia | 2.613E-08 |
| Ammonia, as N | 1.250E-12 |
| Ammonium (total N) | 2.406E-06 |
| Ammonium / ammonia | 5.310E-06 |
| Barium | 1.115E-06 |
| Beryllium | 1.978E-14 |
| Boron | 3.064E-09 |
| Bromate | 3.634E-15 |
| Bromine | 2.959E-14 |
| Calcium (+II) | 2.167E-04 |
| Carbonate | 7.891E-06 |
| Chlorate | 2.963E-12 |
| Chloride | 2.177E-03 |
| Chlorine (dissolved) | 1.195E-07 |
| Copper ion (+II/+III) | 5.802E-14 |
| Cyanide | 1.789E-08 |
| Fluoride | 4.079E-07 |
| Fluorine | 1.830E-11 |
| Hydrogen chloride | 4.083E-13 |
| Hydrogen fluoride (hydrofluoric acid) | 5.628E-14 |
| Hydrogen Ions (H+) | 1.025E-10 |
| Hydroxide | 1.632E-09 |
| Inorganic salts and acids (unspecified) | 6.909E-21 |
| Iron ion (+II/+III) | 7.563E-12 |
| Magnesium (+III) | 2.661E-05 |
| Magnesium chloride | 6.737E-15 |
| Metal ions (unspecific) | 1.097E-11 |
| Neutral salts | 1.595E-14 |
| Nickel ion (+III) | 3.372E-13 |
| Nitrate | 3.604E-08 |
| Nitrate (as total N) | 1.646E-12 |
| Nitrogen | 1.642E-07 |
| Nitrogen (as total N) | 2.101E-08 |

| Process or Category | Cradle to Gate (RMA) |
|---|---|
| Nitrogen organic bounded | 1.743E-09 |
| Phosphate | 1.907E-10 |
| Phosphorus | 2.250E-07 |
| Potassium | 2.337E-11 |
| Silicate particles | 7.856E-07 |
| Sodium (+I) | 4.103E-06 |
| Sodium chloride (rock salt) | 2.214E-05 |
| Sodium hypochlorite | 2.279E-13 |
| Sulfates | 1.010E-05 |
| Sulphate | 5.956E-05 |
| Sulphide | 2.838E-09 |
| Sulphite | 2.701E-10 |
| Sulphur | 6.068E-11 |
| Sulphur dioxide | 0.000E+00 |
| Sulphuric acid | 5.263E-11 |
| Unspecified Iron Oxides | 1.175E-12 |
| Unspecified Oil | 4.164E-12 |
| Unspecified Organic Chlorine compounds | 9.436E-15 |
| Unspecified Salt | 3.775E-11 |
| Unspecified Solids (Suspended) | 1.466E-10 |
| Organic emissions to fresh water | 8.041E-06 |
| Halogenated organic emissions to fresh water | 9.259E-13 |
| 1,2-Dibromoethane | 1.346E-17 |
| Chlorinated hydrocarbons (unspecified) | 5.723E-13 |
| Chloromethane (methyl chloride) | 3.130E-13 |
| Dichloroethane (ethylene dichloride) | 6.193E-15 |
| Dichloropropane | 1.198E-17 |
| Polychlorinated dibenzo-p-dioxins (2,3,7,8 - TCDD) | 2.016E-17 |
| Vinyl chloride (VCM; chloroethene) | 3.433E-14 |
| Hydrocarbons to fresh water | 8.034E-06 |
| Acenaphthene | 5.283E-14 |
| Acenaphthylene | 2.160E-14 |
| Acetic acid | 5.334E-12 |
| Acrylonitrile | 8.764E-13 |
| Anthracene | 6.234E-14 |
| Aromatic hydrocarbons (unspecified) | 5.310E-11 |

| Process or Category | Cradle to Gate (RMA) |
|---|---|
| Benzene | 9.812E-11 |
| Benzo{a}anthracene | 8.533E-15 |
| Benzofluoranthene | 6.058E-15 |
| Chrysene | 4.137E-14 |
| Cresol (methyl phenol) | 1.572E-12 |
| Ethyl benzene | 4.705E-12 |
| Fluoranthene | 9.886E-15 |
| Hexane (isomers) | 1.720E-13 |
| Hydrocarbons (unspecified) | 2.896E-08 |
| Methanol | 7.262E-09 |
| Oil (unspecified) | 7.995E-06 |
| Phenol (hydroxy benzene) | 8.551E-11 |
| Polycyclic aromatic hydrocarbons (PAH, unspec.) | 1.940E-09 |
| Toluene (methyl benzene) | 6.574E-11 |
| Xylene (isomers; dimethyl benzene) | 2.891E-11 |
| Carbon, organically bound | 5.283E-09 |
| Naphthalene | 3.134E-12 |
| N-unspecified (N) | 3.259E-12 |
| Organic chlorine compounds (unspecified) | 3.954E-14 |
| Organic compounds (dissolved) | 4.790E-12 |
| Organic compounds (unspecified) | 5.278E-12 |
| Unspecified wastewater | 2.464E-09 |
| Other emissions to fresh water | 0.000E+00 |
| Detergent (unspecified) | 0.000E+00 |
| non used primary energy from water power | 0.000E+00 |
| Unused primary energy from geothermal | 0.000E+00 |
| Waste heat | 0.000E+00 |
| Waste water | 0.000E+00 |
| Particles to fresh water | 1.885E-05 |
| Metals (unspecified) | 1.834E-11 |
| Silicon dioxide (silica) | 1.787E-11 |
| Soil loss by erosion into water | 9.665E-13 |
| Solids (suspended) | 1.885E-05 |
| Suspended solids, unspecified | 2.946E-10 |
| Unspecified Oxides | 9.770E-13 |
| Radioactive emissions to fresh water | 0.000E+00 |

| Process or Category | Cradle to Gate (RMA) |
|---|---|
| Americium (Am241) | 0.000E+00 |
| Antimony (Sb124) | 0.000E+00 |
| Antimony (Sb125) | 0.000E+00 |
| Carbon (C14) | 0.000E+00 |
| Cesium (Cs134) | 0.000E+00 |
| Cesium (Cs137) | 0.000E+00 |
| Cobalt (Co58) | 0.000E+00 |
| Cobalt (Co60) | 0.000E+00 |
| Curium (Cm alpha) | 0.000E+00 |
| Hydrogen (H3) | 0.000E+00 |
| Iodine (I129) | 0.000E+00 |
| Iodine (I131) | 0.000E+00 |
| Manganese (Mn54) | 0.000E+00 |
| Plutonium (Pu alpha) | 0.000E+00 |
| Radionuclides | 0.000E+00 |
| Radium (Ra226) | 0.000E+00 |
| Ruthenium (Ru106) | 0.000E+00 |
| Silver (Ag110m) | 0.000E+00 |
| Strontium (Sr90) | 0.000E+00 |
| Thorium (Th234) | 0.000E+00 |
| Uranium | 0.000E+00 |
| Bromide | 0.000E+00 |
| Radionuclide | 0.000E+00 |
| Sulfite | 0.000E+00 |
| Unspecified Solids (Dissolved) | 2.825E-10 |
| Uranium (total) | 6.338E-13 |
| Emissions to sea water | 5.435E-06 |
| Analytical measures to sea water | 1.868E-08 |
| Adsorbable organic halogen compounds (AOX) | 1.097E-15 |
| Biological oxygen demand (BOD) | 1.210E-09 |
| Chemical oxygen demand (COD) | 1.626E-08 |
| Total organic bounded carbon | 1.210E-09 |
| Heavy metals to sea water | 4.142E-09 |
| Arsenic (+V) | 5.454E-11 |
| Cadmium (+II) | 3.017E-11 |
| Chromium (unspecified) | 8.653E-11 |

| Process or Category | Cradle to Gate (RMA) |
|---|---|
| Cobalt | 9.724E-12 |
| Copper (+II) | 1.446E-10 |
| Iron | 2.698E-10 |
| Lead (+II) | 3.675E-11 |
| Manganese (+II) | 2.728E-11 |
| Mercury (+II) | 5.172E-13 |
| Molybdenum | 4.286E-10 |
| Nickel (+II) | 5.056E-11 |
| Silver | 3.469E-12 |
| Strontium | 2.799E-09 |
| Tin (+IV) | 4.155E-12 |
| Titanium | 4.232E-13 |
| Vanadium (+III) | 7.197E-12 |
| Zinc (+II) | 1.889E-10 |
| Inorganic emissions to sea water | 4.446E-06 |
| Aluminum (+III) | 1.362E-11 |
| Ammonia | 4.049E-10 |
| Barium | 8.604E-10 |
| Beryllium | 4.910E-13 |
| Boron | 2.203E-10 |
| Calcium (+II) | 2.406E-08 |
| Carbonate | 5.412E-08 |
| Chloride | 4.303E-06 |
| Magnesium | 6.018E-09 |
| Nitrate | 7.015E-11 |
| Sodium (+I) | 2.417E-08 |
| Sulphate | 2.284E-08 |
| Sulphide | 9.852E-09 |
| Sulphur | 1.179E-10 |
| Organic emissions to sea water | 2.669E-09 |
| Hydrocarbons to sea water | 2.649E-09 |
| Acenaphthene | 5.127E-13 |
| Acenaphthylene | 1.984E-13 |
| Acetic acid | 2.102E-13 |
| Anthracene | 2.363E-13 |
| Aromatic hydrocarbons (unspecified) | 1.210E-11 |

| Process or Category | Cradle to Gate (RMA) |
|---|---|
| Benzene | 2.721E-10 |
| Benzo{a}anthracene | 1.080E-13 |
| Benzofluoranthene | 1.127E-13 |
| Chrysene | 5.958E-13 |
| Cresol (methyl phenol) | 3.053E-12 |
| Ethyl benzene | 1.693E-11 |
| Fluoranthene | 1.258E-13 |
| Hexane (isomers) | 3.334E-13 |
| Oil (unspecified) | 1.774E-09 |
| Phenol (hydroxy benzene) | 3.195E-10 |
| Toluene (methyl benzene) | 1.731E-10 |
| Xylene (isomers; dimethyl benzene) | 7.590E-11 |
| Naphthalene | 1.985E-11 |
| Particles to sea water | 9.633E-07 |
| Solids (suspended) | 9.633E-07 |
| Emissions to industrial soil | 2.152E-04 |
| Heavy metals to industrial soil | 2.151E-04 |
| Antimony | 2.497E-19 |
| Arsenic (+V) | 1.192E-07 |
| Cadmium (+II) | 1.900E-13 |
| Chromium (+III) | 1.893E-14 |
| Chromium (+VI) | 9.047E-19 |
| Chromium (unspecified) | 2.362E-11 |
| Cobalt | 2.181E-13 |
| Copper (+II) | 1.583E-13 |
| Iron | 2.134E-04 |
| Lead (+II) | 8.526E-07 |
| Manganese (+II) | 1.893E-11 |
| Mercury (+II) | 2.205E-09 |
| Nickel (+II) | 5.938E-11 |
| Selenium | 1.416E-08 |
| Strontium | 4.529E-09 |
| Thallium | 1.031E-07 |
| Vanadium (+III) | 6.509E-07 |
| Zinc (+II) | 4.257E-12 |
| Inorganic emissions to industrial soil | 2.707E-08 |

| Process or Category | Cradle to Gate (RMA) |
|---|---|
| Aluminum (+III) | 4.051E-11 |
| Ammonia | 7.216E-09 |
| Bromide | 1.867E-12 |
| Calcium (+II) | 7.315E-09 |
| Chloride | 2.601E-09 |
| Chlorine | 2.111E-16 |
| Fluoride | 6.225E-11 |
| Magnesium (+III) | 1.011E-09 |
| Phosphorus | 7.409E-10 |
| Potassium (+I) | 3.623E-09 |
| Sodium (+I) | 6.398E-10 |
| Sulphate | 5.457E-10 |
| Sulphide | 3.274E-09 |
| Organic emissions to industrial soil | 4.616E-11 |
| Oil (unspecified) | 4.616E-11 |
| Radioactive emissions to industrial soil | 0.000E+00 |
| Uranium | 0.000E+00 |
| Calcium Fluoride | 1.628E-08 |
| Radionuclide | 0.000E+00 |

## Embedded Unit Processes

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None.

## Section III: Document Control Information

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## Section IV: Disclaimer