# NETL Life Cycle Inventory Data
# Process Documentation File

**Process Name:** Enclosed 8B Truck, Transport

**Reference Flow:** 1 kg of cargo

**Brief Description:** This process includes all inputs for the raw material transportation for 1 kg of cargo.

## Section I: Meta Data

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

**Year Data Best Represents:** 2006

**Process Type:** Transport Process (TP)

**Process Scope:** Gate-to-Gate Process (GG)

**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:**

Distance — *The distance the cargo travels*

**Tracked Input Flows:**

Cargo — *The cargo that the truck will carry*

**Tracked Output Flows:**

Cargo — *Cargo delivered*

## Section II: Process Description

### Associated Documentation

This unit process is composed of this document and the data sheet (DS) *DS_RMT_Enclosed8BTruck_Transport_2011.01.xls*, which provides additional details regarding relevant calculations, data quality, and references.

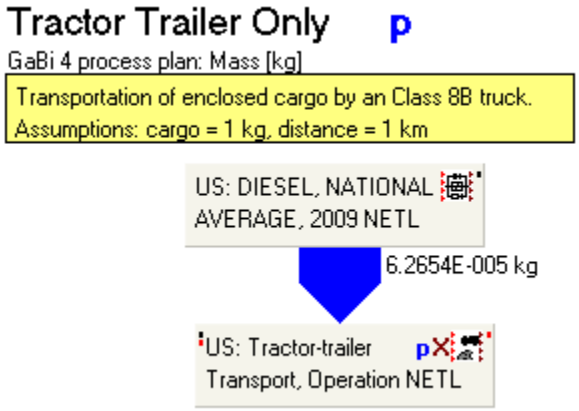
### Goal and Scope

The scope of this unit process covers all aspects of raw material transportation (RMT) as seen in **Figure 1**. These processes were developed for the transportation of cargo. At the end, one kilogram of cargo is delivered to the life cycle (LC) Stage #3 boundary.

### Boundary and Description

This unit process includes the operation of a tractor trailer. The truck consists of a cab and an enclosed trailer that is powered by diesel. The transport distance is an adjustable parameter for RMT. The plan for RMT is provided in **Figure 1**.

**Figure 1: Plan for Tractor Trailer Transportation, including Operation of Profile**




The profiles and processes included in RMT are provided in **Table 1**. Those shown in bold face were developed by NETL.

**Table 1: Profiles and Processes Included in RMT for Tractor Trailer Transportation**

| |
|---|
| Tractor Trailer Only |
| US: DIESEL, NATIONAL AVERAGE, 2009 NETL <u-so> |
| US: Tractor-trailer Transport, Operation NETL |

## Parameters and Balances

The parameters for the highest level modeling plan for the enclosed 8B truck transportation 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 RMT plan.

**Table 2: Adjustable Parameters for RMT of Tractor Trailer Transportation**

| Plan | Parameter | Value | Comment |
|---|---|---|---|
| *LC Stage #2* | | | |
| Stage #2: Tractor-trailer Transport | Distance | 1 | [km] input tractor trailer travel distance |

**Table 3: Inputs and Output Balances for RMT of Tractor Trailer Transportation (kg/kg delivered)**

| Process or Category | Gate to Gate (RMT) |
|---|---|
| Inputs | |
| Flows | 1.993E-04 |
| Resources | 1.993E-04 |
| Energy resources | 2.398E-05 |
| Non renewable energy resources | 2.398E-05 |
| Crude oil (resource) | 1.990E-05 |
| Hard coal (resource) | 8.005E-07 |
| Lignite (resource) | 1.633E-07 |
| Natural gas (resource) | 3.117E-06 |
| Uranium (resource) | 2.192E-11 |
| Renewable energy resources | 5.245E-11 |
| Biomass | 1.885E-11 |
| Renewable fuels | 1.729E-17 |
| Wood | 3.359E-11 |
| Unspecified | 0.000E+00 |
| Land use | 0.000E+00 |
| Material resources | 1.754E-04 |
| Non renewable elements | 5.127E-09 |
| Aluminum | 2.126E-14 |
| Chromium | 1.410E-15 |
| Copper | 1.103E-16 |

| Process or Category | Gate to Gate (RMT) |
|---|---|
| Iron | 5.097E-09 |
| Lead | 8.698E-16 |
| Magnesium | 1.666E-18 |
| Mercury | 4.148E-16 |
| Nickel | 5.222E-18 |
| Phosphorus | 1.665E-13 |
| Sulphur | 1.590E-12 |
| Zinc | 2.837E-11 |
| Non renewable resources | 1.051E-05 |
| Barium sulphate | 1.388E-19 |
| Basalt | 2.068E-09 |
| Bauxite | 2.241E-08 |
| Bentonite | 9.039E-08 |
| Calcium carbonate (CaCO3) | 1.384E-10 |
| Calcium chloride | 1.421E-17 |
| Chalk (Calciumcarbonate) | 1.546E-42 |
| Chromium ore (39%) | 2.610E-12 |
| Clay | 6.003E-09 |
| Colemanite ore | 2.197E-13 |
| Copper - Gold - Silver - ore (1,0% Cu; 0,4 g/t Au; 66 g/t Ag) | 6.583E-12 |
| Copper - Gold - Silver - ore (1,1% Cu; 0,01 g/t Au; 2,86 g/t Ag) | 4.010E-12 |
| Copper - Gold - Silver - ore (1,16% Cu; 0,002 g/t Au; 1,06 g/t Ag) | 2.264E-12 |
| Copper - Molybdenum - Gold - Silver - ore (1,13% Cu; 0,02% Mo; 0,01 g/t Au; 2,86 g/t Ag) | 5.515E-12 |
| Copper ore (0.14%) | 4.139E-11 |
| Copper ore (1.2%) | 6.827E-13 |
| Copper ore (4%) | 3.333E-20 |
| Copper ore (sulphidic, 1.1%) | 9.488E-12 |
| Dolomite | 3.092E-10 |
| Feldspar (aluminum silicates) | 1.174E-13 |
| Ferro manganese | 2.567E-16 |
| Fluorspar (calcium fluoride; fluorite) | 1.676E-10 |
| Granite | 3.181E-23 |
| Gypsum (natural gypsum) | 3.283E-09 |
| Heavy spar (BaSO4) | 2.186E-07 |
| Ilmenite (titanium ore) | 2.615E-18 |
| Inert rock | 9.852E-06 |
| Iron ore (56,86%) | 6.966E-08 |
| Iron ore (65%) | 3.525E-12 |

| Process or Category | Gate to Gate (RMT) |
|---|---|
| Kaolin ore | 3.714E-13 |
| Lead - zinc ore (4.6%-0.6%) | 1.852E-08 |
| Limestone (calcium carbonate) | 1.884E-07 |
| Magnesit (Magnesium carbonate) | 6.474E-14 |
| Magnesium chloride leach (40%) | 1.533E-09 |
| Manganese ore | 5.160E-13 |
| Manganese ore (R.O.M.) | 6.917E-10 |
| Molybdenite (Mo 0,24%) | 3.422E-12 |
| Natural Aggregate | 1.749E-08 |
| Nickel ore (1,5%) | 2.686E-16 |
| Nickel ore (1.6%) | 2.434E-09 |
| Olivine | 2.676E-15 |
| Peat | 1.326E-10 |
| Phosphate ore | 9.948E-14 |
| Phosphorus minerals | 1.520E-11 |
| Phosphorus ore (29% P2O5) | 1.275E-16 |
| Potassium chloride | 2.147E-12 |
| Precious metal ore (R.O.M) | 2.528E-13 |
| Quartz sand (silica sand; silicon dioxide) | 2.619E-09 |
| Raw pumice | 1.442E-14 |
| Rutile (titanium ore) | 5.113E-14 |
| sand | 3.956E-13 |
| Slate | 5.840E-15 |
| Sodium chloride (rock salt) | 9.276E-10 |
| Sodium nitrate | 8.868E-23 |
| Sodium sulphate | 1.774E-14 |
| Soil | 6.314E-09 |
| Sulphur (bonded) | 3.055E-16 |
| Talc | 2.915E-14 |
| Tin ore | 1.203E-20 |
| Titanium ore | 2.283E-10 |
| Zinc - copper ore (4.07%-2.59%) | 2.965E-09 |
| Zinc - lead - copper ore (12%-3%-2%) | 1.346E-09 |
| Zinc - lead ore (4.21%-4.96%) | 1.138E-20 |
| Zinc ore (4%) | -2.189E-11 |
| Zinc ore (sulphidic, 4%) | 6.190E-20 |
| Renewable resources | 1.649E-04 |
| Water | 1.489E-04 |

| Process or Category | Gate to Gate (RMT) |
|---|---|
| Water | 1.165E-04 |
| Water (feed water) | 1.079E-08 |
| Water (ground water) | 4.256E-06 |
| Water (sea water) | 1.728E-07 |
| Water (surface water) | 2.801E-05 |
| Water (well water) | 1.176E-09 |
| Water (with river silt) | 1.803E-20 |
| Air | 1.592E-05 |
| Carbon dioxide | 1.796E-08 |
| Nitrogen | 3.869E-11 |
| Oxygen | 0.000E+00 |
| Unspecified | 6.101E-12 |
| Unspecified minerals | 1.388E-12 |
| Unspecified resources | 4.713E-12 |
| Area of Production Land | 0.000E+00 |
| | |
| Output | |
| | |
| Flows | 9.432E-05 |
| Resources | 2.217E-05 |
| Energy resources | 0.000E+00 |
| Land use | 0.000E+00 |
| Material resources | 2.217E-05 |
| Renewable resources | 2.217E-05 |
| Water | 2.217E-05 |
| Water (river water) | 2.144E-05 |
| Water (wastewater) | 7.269E-07 |
| Nitrogen | 0.000E+00 |
| Oxygen | 2.990E-10 |
| Ecoinvent | 2.521E-16 |
| Long-term emission | 2.521E-16 |
| Fresh water | 2.521E-16 |
| Dissolved organic carbon, DOC (Ecoinvent) | 2.521E-16 |
| Production residues in life cycle | 2.704E-08 |
| Hazardous waste for disposal | 6.445E-09 |
| Dross (Fines) | 4.281E-11 |
| Natrium oxide | 7.276E-11 |
| Red mud (dry) | 6.321E-09 |

| Process or Category | Gate to Gate (RMT) |
|---|---|
| Soil and sand containing heavy metals | 4.785E-13 |
| Toxic chemicals (unspecified) | 7.670E-12 |
| Hazardous waste for recovery | 2.699E-11 |
| Used oil | 1.151E-11 |
| Waste water processing residue | 1.548E-11 |
| Waste for disposal | 1.334E-08 |
| Incineration good | 4.185E-12 |
| Sludge from water works (6% dry matter-content) | 2.410E-13 |
| Waste (solid) | 9.525E-09 |
| Waste from steel works | 3.813E-09 |
| Waste for recovery | 7.228E-09 |
| Aluminum scrap | 9.611E-17 |
| Chemicals (unspecified) | 2.299E-12 |
| Cooling water | 7.126E-09 |
| Cryolite | 1.996E-11 |
| Dross | 1.436E-11 |
| Gypsum (FDI) | 2.223E-18 |
| Plastic (unspecified) | 4.319E-12 |
| Production residues (unspecified) | 3.186E-14 |
| Rolling tinder | 3.909E-25 |
| Slag | 6.180E-11 |
| Waste paper | 6.346E-16 |
| Wood | 2.410E-15 |
| Wooden pallet (EURO) | 1.283E-20 |
| Mixed Waste (Hazardous or Radioactive) | 0.000E+00 |
| Neutralized residues | 4.211E-19 |
| Emissions to air | 7.108E-05 |
| Heavy metals to air | 9.033E-12 |
| Antimony | 2.431E-14 |
| Arsenic (+V) | 2.974E-13 |
| Arsenic trioxide | 1.213E-17 |
| Cadmium (+II) | 2.211E-14 |
| Chromium (+III) | 2.553E-15 |
| Chromium (unspecified) | 5.545E-14 |
| Cobalt | 2.316E-14 |
| Copper (+II) | 1.272E-13 |
| Heavy metals to air (unspecified) | 1.319E-16 |
| Hydrogen arsenic (arsine) | 1.007E-15 |

| Process or Category | Gate to Gate (RMT) |
|---|---|
| Iron | 7.644E-14 |
| Lanthanides | 4.660E-18 |
| Lead (+II) | 5.014E-13 |
| Manganese (+II) | 1.384E-13 |
| Mercury (+II) | 5.853E-14 |
| Molybdenum | 5.476E-15 |
| Nickel (+II) | 8.052E-13 |
| Palladium | 3.932E-22 |
| Rhodium | 3.796E-22 |
| Selenium | 7.021E-13 |
| Silver | 6.443E-22 |
| Tellurium | 3.405E-16 |
| Thallium | 2.509E-15 |
| Tin (+IV) | 2.506E-13 |
| Titanium | 3.010E-16 |
| Vanadium (+III) | 4.996E-12 |
| Zinc (+II) | 9.423E-13 |
| Inorganic emissions to air | 5.882E-05 |
| Ammonia | 1.712E-10 |
| Ammonium | 2.153E-18 |
| Ammonium nitrate | 1.769E-18 |
| Barium | 1.381E-10 |
| Beryllium | 4.788E-15 |
| Boron compounds (unspecified) | 5.540E-12 |
| Bromine | 2.201E-12 |
| Carbon dioxide | 5.205E-05 |
| Carbon dioxide (biotic) | 7.909E-09 |
| Carbon disulphide | 3.236E-16 |
| Carbon monoxide | 6.646E-08 |
| Chloride (unspecified) | 6.674E-13 |
| Chlorine | 6.800E-14 |
| Cyanide (unspecified) | 3.872E-14 |
| Fluoride | 3.788E-12 |
| Fluorides | 1.022E-13 |
| Fluorine | 1.540E-16 |
| Helium | 5.071E-14 |
| Hydrogen | 1.244E-11 |
| Hydrogen bromine (hydrobromic acid) | 3.359E-15 |

| Process or Category | Gate to Gate (RMT) |
|---|---|
| Hydrogen chloride | 7.743E-11 |
| Hydrogen cyanide (prussic acid) | 1.775E-15 |
| Hydrogen fluoride | 1.303E-11 |
| Hydrogen iodide | 1.064E-18 |
| Hydrogen phosphorous | 1.056E-16 |
| Hydrogen sulphide | 1.171E-10 |
| Lead dioxide | 3.094E-16 |
| Nitrogen (atmospheric nitrogen) | 1.925E-09 |
| Nitrogen dioxide | 2.396E-09 |
| Nitrogen monoxide | 8.798E-14 |
| Nitrogen oxides | 4.523E-08 |
| Nitrous oxide (laughing gas) | 1.066E-09 |
| Oxygen | 1.180E-08 |
| Scandium | 2.231E-18 |
| Steam | 6.572E-06 |
| Strontium | 8.748E-17 |
| Sulphur dioxide | 6.070E-08 |
| Sulphur hexafluoride | 3.466E-17 |
| Sulphuric acid | 6.579E-14 |
| Tin oxide | 4.322E-20 |
| Unspecified Particles | 1.136E-11 |
| Zinc oxide | 8.644E-20 |
| Zinc sulphate | 2.536E-14 |
| Organic emissions to air (group VOC) | 1.602E-07 |
| Group NMVOC to air | 4.565E-08 |
| Group PAH to air | 1.243E-12 |
| Anthracene | 3.251E-15 |
| Benzo{a}anthracene | 1.636E-15 |
| Benzo{a}pyrene | 3.606E-14 |
| Benzo{ghi}perylene | 1.459E-15 |
| Benzofluoranthene | 2.919E-15 |
| Chrysene | 4.018E-15 |
| Dibenz(a)anthracene | 9.092E-16 |
| Indeno[1,2,3-cd]pyrene | 1.086E-15 |
| Naphthalene | 3.415E-13 |
| Phenanthrene | 1.073E-13 |
| Polycyclic aromatic hydrocarbons (PAH) | 7.425E-13 |
| Halogenated organic emissions to air | 1.238E-12 |

| Process or Category | Gate to Gate (RMT) |
|---|---|
| Dichloroethane (ethylene dichloride) | 4.511E-19 |
| Dichloromethane (methylene chloride) | 1.805E-17 |
| Dioxins (unspec.) | 3.254E-19 |
| Halogenated hydrocarbons (unspecified) | 2.157E-15 |
| Polychlorinated biphenyls (PCB unspecified) | 2.212E-15 |
| Polychlorinated dibenzo-p-dioxins (2,3,7,8 - TCDD) | 2.644E-19 |
| R 11 (trichlorofluoromethane) | 1.604E-13 |
| R 114 (dichlorotetrafluoroethane) | 1.643E-13 |
| R 116 (hexafluoroethane) | 7.788E-14 |
| R 12 (dichlorodifluoromethane) | 3.449E-14 |
| R 13 (chlorotrifluoromethane) | 2.166E-14 |
| R 22 (chlorodifluoromethane) | 3.770E-14 |
| Tetrafluoromethane | 7.024E-13 |
| Vinyl chloride (VCM; chloroethene) | 3.519E-14 |
| Acetaldehyde (Ethanal) | 8.923E-13 |
| Acetic acid | 2.081E-12 |
| Acetone (dimethylcetone) | 8.408E-13 |
| Acrolein | 2.294E-14 |
| Aldehyde (unspecified) | 5.854E-14 |
| Alkane (unspecified) | 1.231E-11 |
| Alkene (unspecified) | 1.051E-11 |
| Aromatic hydrocarbons (unspecified) | 2.070E-13 |
| Benzene | 3.644E-12 |
| Butadiene | 1.975E-18 |
| Butane | 1.715E-09 |
| Butane (n-butane) | 2.259E-12 |
| Caprolactam | 1.230E-15 |
| Cyclohexane (hexahydro benzene) | 8.134E-16 |
| Diethylamine | 5.383E-23 |
| Ethane | 4.660E-09 |
| Ethanol | 1.058E-12 |
| Ethene (ethylene) | 1.162E-13 |
| Ethyl benzene | 1.048E-11 |
| Fluoranthene | 1.059E-14 |
| Fluorene | 3.360E-14 |
| Formaldehyde (methanal) | 5.699E-12 |
| Heptane (isomers) | 5.745E-11 |
| Hexamethylene diamine (HMDA) | 1.162E-19 |

| Process or Category | Gate to Gate (RMT) |
|---|---|
| Hexane (isomers) | 8.614E-11 |
| Mercaptan (unspecified) | 4.674E-13 |
| Methanethiol | 2.888E-13 |
| Methanol | 9.546E-13 |
| NMVOC (unspecified) | 3.003E-08 |
| Octane | 3.160E-11 |
| Pentane (n-pentane) | 5.922E-10 |
| Phenol (hydroxy benzene) | 4.546E-17 |
| Propane | 8.373E-09 |
| Propene (propylene) | 9.469E-13 |
| Propionic acid (propane acid) | 4.790E-16 |
| Styrene | 6.029E-18 |
| Toluene (methyl benzene) | 5.641E-12 |
| Trimethylbenzene | 4.210E-19 |
| Xylene (dimethyl benzene) | 4.418E-11 |
| Hydrocarbons (unspecified) | 2.023E-12 |
| Methane | 9.955E-08 |
| Organic chlorine compounds | 2.686E-15 |
| Unspecified Organic Compounds | 7.895E-18 |
| VOC (unspecified) | 1.500E-08 |
| Other emissions to air | 1.209E-05 |
| Aldehydes, unspecified | 3.948E-18 |
| Exhaust | 1.205E-05 |
| Particulate Matter, unspecified | 8.503E-10 |
| Sand (Silica) (SiO2) | 7.526E-14 |
| Used air | 3.546E-08 |
| Particles to air | 1.658E-09 |
| Dust (PM10) | 1.337E-10 |
| Dust (PM2.5) | 3.762E-10 |
| Dust (unspecified) | 1.148E-09 |
| Metals (unspecified) | 2.122E-15 |
| Unspecified Organic Chlorine Compounds | 5.209E-17 |
| Wood (dust) | 1.595E-17 |
| Radioactive emissions to air | 1.884E-13 |
| Uranium (total) | 1.884E-13 |
| Unspecified Heavy Metals | 4.068E-21 |
| Emissions to fresh water | 7.503E-07 |
| Analytical measures to fresh water | 3.169E-09 |

| Process or Category | Gate to Gate (RMT) |
|---|---|
| Adsorbable organic halogen compounds (AOX) | 4.800E-12 |
| Biological oxygen demand (BOD) | 1.746E-10 |
| Chemical oxygen demand (COD) | 2.777E-09 |
| Nitrogenous Matter (unspecified, as N) | 5.522E-13 |
| Solids (dissolved) | 2.930E-11 |
| Total dissolved organic bounded carbon | 4.159E-13 |
| Total organic bounded carbon | 1.828E-10 |
| Heavy metals to fresh water | 1.613E-07 |
| Aluminium | 2.922E-08 |
| Antimony | 2.589E-10 |
| Arsenic (+V) | 8.294E-10 |
| Cadmium (+II) | 8.149E-11 |
| Chromium (+III) | 4.125E-14 |
| Chromium (+VI) | 2.270E-17 |
| Chromium (unspecified) | 1.433E-09 |
| Cobalt | 2.153E-14 |
| Copper (+II) | 1.205E-09 |
| Heavy metals to water (unspecified) | 2.923E-15 |
| Iron | 6.440E-08 |
| Lead (+II) | 2.803E-09 |
| Manganese (+II) | 2.685E-12 |
| Mercury (+II) | 1.410E-11 |
| Molybdenum | 4.859E-13 |
| Nickel (+II) | 2.221E-08 |
| Selenium | 8.185E-14 |
| Silver | 2.528E-10 |
| Strontium | 6.073E-11 |
| Thallium | 4.254E-16 |
| Tin (+IV) | 7.584E-14 |
| Titanium | 6.149E-14 |
| Unspecified Substance | 3.519E-17 |
| Vanadium (+III) | 1.847E-13 |
| Zinc (+II) | 3.853E-08 |
| Inorganic emissions to fresh water | 4.477E-07 |
| Acid (calculated as H+) | 4.480E-12 |
| Aluminum (+III) | 1.535E-11 |
| Ammonia | 7.773E-12 |
| Ammonium (total N) | 3.163E-07 |

| Process or Category | Gate to Gate (RMT) |
|---|---|
| Ammonium / ammonia | 3.299E-11 |
| Barium | 1.504E-11 |
| Beryllium | 5.643E-16 |
| Boron | 8.849E-12 |
| Bromate | 2.396E-17 |
| Bromine | 1.543E-15 |
| Calcium (+II) | 1.240E-09 |
| Carbonate | 9.446E-10 |
| Chlorate | 2.294E-14 |
| Chloride | 8.833E-08 |
| Chlorine (dissolved) | 2.113E-11 |
| Copper ion (+II/+III) | 3.553E-18 |
| Cyanide | 2.352E-09 |
| Fluoride | 2.198E-09 |
| Fluorine | 1.333E-13 |
| Hydrogen chloride | 2.572E-15 |
| Hydrogen fluoride (hydrofluoric acid) | 1.478E-15 |
| Hydrogen Ions (H+) | 7.856E-15 |
| Hydroxide | 1.372E-11 |
| Inorganic salts and acids (unspecified) | 1.006E-24 |
| Magnesium (+III) | 2.850E-10 |
| Magnesium chloride | 1.070E-16 |
| Metal ions (unspecific) | 1.087E-12 |
| Neutral salts | 1.838E-17 |
| Nitrate | 8.426E-11 |
| Nitrate (as total N) | 1.262E-16 |
| Nitrogen | 5.001E-13 |
| Nitrogen organic bounded | 5.153E-12 |
| Phosphate | 6.212E-13 |
| Phosphorus | 2.791E-08 |
| Potassium | 7.926E-13 |
| Silicate particles | 5.521E-16 |
| Sodium (+I) | 4.080E-09 |
| Sodium chloride (rock salt) | 1.321E-16 |
| Sodium hypochlorite | 1.734E-16 |
| Sulphate | 3.730E-09 |
| Sulphide | 1.723E-10 |
| Sulphite | 1.464E-12 |

| Process or Category | Gate to Gate (RMT) |
|---|---|
| Sulphur | 2.151E-12 |
| Sulphuric acid | 3.316E-13 |
| Unspecified Iron Oxides | 9.011E-17 |
| Unspecified Oil | 3.193E-16 |
| Unspecified Organic Chlorine compounds | 7.235E-19 |
| Unspecified Salt | 2.895E-15 |
| Unspecified Solids (Suspended) | 1.124E-14 |
| Organic emissions to fresh water | 3.325E-10 |
| Halogenated organic emissions to fresh water | 2.031E-15 |
| 1,2-Dibromoethane | 1.911E-19 |
| Chlorinated hydrocarbons (unspecified) | 1.856E-21 |
| Chloromethane (methyl chloride) | 2.031E-15 |
| Dichloroethane (ethylene dichloride) | 1.210E-21 |
| Dichloropropane | 9.323E-23 |
| Polychlorinated dibenzo-p-dioxins (2,3,7,8 - TCDD) | 5.704E-23 |
| Vinyl chloride (VCM; chloroethene) | 2.134E-19 |
| Hydrocarbons to fresh water | 5.696E-11 |
| Acenaphthene | 2.889E-15 |
| Acenaphthylene | 1.203E-15 |
| Acetic acid | 7.261E-14 |
| Acrylonitrile | 6.819E-18 |
| Anthracene | 4.118E-15 |
| Aromatic hydrocarbons (unspecified) | 1.762E-12 |
| Benzene | 5.781E-12 |
| Benzo{a}anthracene | 4.187E-16 |
| Benzofluoranthene | 2.278E-16 |
| Chrysene | 1.890E-15 |
| Cresol (methyl phenol) | 5.572E-14 |
| Ethyl benzene | 2.857E-13 |
| Fluoranthene | 4.808E-16 |
| Hexane (isomers) | 6.084E-15 |
| Hydrocarbons (unspecified) | 2.535E-13 |
| Methanol | 2.937E-12 |
| Oil (unspecified) | 3.563E-11 |
| Phenol (hydroxy benzene) | 5.113E-12 |
| Polycyclic aromatic hydrocarbons (PAH, unspec.) | 1.476E-13 |
| Toluene (methyl benzene) | 3.720E-12 |
| Xylene (isomers; dimethyl benzene) | 1.183E-12 |

| Process or Category | Gate to Gate (RMT) |
|---|---|
| Carbon, organically bound | 2.750E-10 |
| Naphthalene | 1.849E-13 |
| N-unspecified (N) | 2.498E-16 |
| Organic chlorine compounds (unspecified) | 4.030E-16 |
| Organic compounds (dissolved) | 1.732E-13 |
| Organic compounds (unspecified) | 4.847E-14 |
| Unspecified wastewater | 1.889E-13 |
| Other emissions to fresh water | 0.000E+00 |
| Particles to fresh water | 1.378E-07 |
| Metals (unspecified) | 1.505E-14 |
| Silicon dioxide (silica) | 6.284E-20 |
| Soil loss by erosion into water | 2.682E-14 |
| Solids (suspended) | 1.378E-07 |
| Suspended solids, unspecified | 6.941E-13 |
| Unspecified Oxides | 7.491E-17 |
| Radioactive emissions to fresh water | 0.000E+00 |
| Bromide | 0.000E+00 |
| Radionuclide | 0.000E+00 |
| Sulfite | 0.000E+00 |
| Unspecified Solids (Dissolved) | 2.166E-14 |
| Uranium (total) | 0.000E+00 |
| Emissions to sea water | 3.031E-07 |
| Analytical measures to sea water | 1.454E-09 |
| Adsorbable organic halogen compounds (AOX) | 9.471E-17 |
| Biological oxygen demand (BOD) | 1.045E-10 |
| Chemical oxygen demand (COD) | 1.245E-09 |
| Total organic bounded carbon | 1.045E-10 |
| Heavy metals to sea water | 3.116E-10 |
| Arsenic (+V) | 3.226E-12 |
| Cadmium (+II) | 1.621E-12 |
| Chromium (unspecified) | 5.057E-12 |
| Cobalt | 2.308E-13 |
| Copper (+II) | 1.037E-11 |
| Iron | 1.689E-11 |
| Lead (+II) | 2.798E-12 |
| Manganese (+II) | 1.678E-12 |
| Mercury (+II) | 3.813E-14 |
| Molybdenum | 1.093E-13 |

| Process or Category | Gate to Gate (RMT) |
|---|---|
| Nickel (+II) | 3.326E-12 |
| Silver | 3.242E-13 |
| Strontium | 2.613E-10 |
| Tin (+IV) | 3.883E-13 |
| Titanium | 3.955E-14 |
| Vanadium (+III) | 2.077E-13 |
| Zinc (+II) | 4.005E-12 |
| Inorganic emissions to sea water | 2.180E-07 |
| Aluminum (+III) | 1.273E-12 |
| Ammonia | 3.783E-11 |
| Barium | 4.152E-11 |
| Beryllium | 7.150E-15 |
| Boron | 2.059E-11 |
| Calcium (+II) | 2.248E-09 |
| Carbonate | 2.612E-09 |
| Chloride | 2.088E-07 |
| Magnesium | 5.609E-10 |
| Nitrate | 3.386E-12 |
| Sodium (+I) | 2.086E-09 |
| Sulphate | 1.103E-09 |
| Sulphide | 4.756E-10 |
| Sulphur | 1.102E-11 |
| Organic emissions to sea water | 1.319E-10 |
| Hydrocarbons to sea water | 1.312E-10 |
| Acenaphthene | 1.396E-14 |
| Acenaphthylene | 5.521E-15 |
| Acetic acid | 4.183E-15 |
| Anthracene | 1.028E-14 |
| Aromatic hydrocarbons (unspecified) | 1.045E-12 |
| Benzene | 1.545E-11 |
| Benzo{a}anthracene | 2.678E-15 |
| Benzofluoranthene | 2.506E-15 |
| Chrysene | 1.420E-14 |
| Cresol (methyl phenol) | 2.853E-13 |
| Ethyl benzene | 7.400E-13 |
| Fluoranthene | 3.110E-15 |
| Hexane (isomers) | 3.115E-14 |
| Oil (unspecified) | 8.737E-11 |

| Process or Category | Gate to Gate (RMT) |
|---|---|
| Phenol (hydroxy benzene) | 1.292E-11 |
| Toluene (methyl benzene) | 1.038E-11 |
| Xylene (isomers; dimethyl benzene) | 2.948E-12 |
| Naphthalene | 6.619E-13 |
| Particles to sea water | 8.314E-08 |
| Solids (suspended) | 8.314E-08 |
| Emissions to agricultural soil | 0.000E+00 |
| Emissions to industrial soil | 8.872E-10 |
| Heavy metals to industrial soil | 2.311E-10 |
| Arsenic (+V) | 2.567E-16 |
| Cadmium (+II) | 2.658E-15 |
| Chromium (+III) | 1.280E-15 |
| Chromium (unspecified) | 6.177E-13 |
| Cobalt | 1.101E-14 |
| Copper (+II) | 7.242E-15 |
| Iron | 8.741E-13 |
| Lead (+II) | 2.076E-15 |
| Manganese (+II) | 1.298E-13 |
| Mercury (+II) | 2.455E-17 |
| Nickel (+II) | 1.757E-13 |
| Strontium | 2.292E-10 |
| Zinc (+II) | 7.101E-14 |
| Inorganic emissions to industrial soil | 6.551E-10 |
| Aluminum (+III) | 6.690E-13 |
| Ammonia | 3.546E-10 |
| Bromide | 9.438E-14 |
| Calcium (+II) | 5.131E-13 |
| Chloride | 1.101E-10 |
| Fluoride | 3.146E-12 |
| Magnesium (+III) | 7.206E-14 |
| Phosphorus | 3.728E-11 |
| Potassium (+I) | 7.491E-11 |
| Sodium (+I) | 4.468E-14 |
| Sulphate | 1.052E-11 |
| Sulphide | 6.313E-11 |
| Organic emissions to industrial soil | 9.456E-13 |
| Oil (unspecified) | 9.456E-13 |
| Radioactive emissions to industrial soil | 0.000E+00 |

| Process or Category | Gate to Gate (RMT) |
|---|---|
| Calcium Fluoride | 0.000E+00 |
| Radionuclide | 0.000E+00 |

### Embedded Unit Processes

NETL (2010). *NETL Life Cycle Inventory Data – Unit Process: Tractor Trailer Biomass Transport – Class 8B, Operations*. U.S. Department of Energy, National Energy Technology Laboratory. Last Updated: January 2010 (version 01). www.netl.doe.gov/energy-analyses (http://www.netl.doe.gov/energy-analyses)

### References

None.

## Section III: Document Control Information

**Date Created:** September 12, 2011

**Point of Contact:** Timothy Skone (NETL), Timothy.Skone@NETL.DOE.GOV

**Revision History:**

Original/no revisions

**How to Cite This Document:** This document should be cited as:

NETL (2011). *NETL Life Cycle Inventory Data – Unit Process: Enclosed 8B Truck, Transport.* U.S. Department of Energy, National Energy Technology Laboratory. Last Updated: September 2011 (version 01). www.netl.doe.gov/energy-analyses (http://www.netl.doe.gov/energy-analyses)

## Section IV: Disclaimer

Neither the U.S. Department of Energy (DOE) National Energy Technology Laboratory (NETL) nor any person acting on behalf of these organizations:

A. Makes any warranty or representation, express or implied, with respect to the accuracy, completeness, or usefulness of the information contained in this document, or that the use of any information, apparatus, method, or process disclosed in this document may not infringe on privately owned rights; or

B. Assumes any liability with this report as to its use, or damages resulting from the use of any information, apparatus, method, or process disclosed in this document.

Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by NETL. The views and opinions of the authors expressed herein do not necessarily state or reflect those of NETL.