Life-Cycle Assessment of Thermally-Modified Southern Pine Decking

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Abstract

Thermally-modified wood is currently used primarily for solid wood flooring, external cladding, and decking products. Thermal modification processing imparts advantageous properties in wood, including attractive darker color, reduced equilibrium moisture content (EMC), reduction of mass, degradation of water-binding hemicelluloses, and elimination of many volatile organic compounds (VOCs). The result is a high-value, high-performing solid wood product with increased moisture resistance, decreased swelling and shrinkage due to weathering and atmospheric moisture changes, and increased resistance to degradation from rot-inducing fungi. Thermal modification can also reduce environmental impacts of wood products because it is an alternative to chemical preservatives, such as creosote, chromated copper arsenate (CCA), and acid copper chromate.

While substantial life-cycle assessment (LCA)-developed environmental impact data exist for a wide range of wood products, there is very little published data on the environmental impacts of thermally-modified wood. Thus, unsubstantiated claims on the performance of these products still exist. This study attempted to fill this knowledge gap by completing a comparative LCA of thermally-modified softwood exterior decking and ACQ-treated softwood exterior decking following International Organization for Standardization (ISO) 14040 and 14044 guidelines.

The study revealed that the environmental impacts of thermally-modified wood decking, whether landfilled or incinerated at end-of-life, were very similar. The thermally-modified wood decking also had lower human health, resources, and climate change impacts than landfilled ACQ-treated wood decking; however, the ACQ-treated wood decking had lower water use impacts than the thermally-modified wood decking. The thermally-modified wood decking also had lower stratospheric ozone depletion, fine particulate matter formation, terrestrial acidification, terrestrial ecotoxicity, freshwater ecotoxicity, marine ecotoxicity, and mineral resource scarcity potential than the ACQ-treated wood decking.

The study also revealed that the production of softwood boards accounted for the largest portion of total impact in each impact category for both decking types. Manufacture of the ACQ preservative itself was the next largest contributor to the total impacts in each impact category for the ACQ-treated wood decking, while combustion of fuel oil for heating the thermal-modification equipment was the next largest contributor to the total impacts for the thermally-modified wood decking.

This – and future – research helps fill the knowledge gap so thermally-modified wood manufacturers can more effectively identify possible ways to improve the environmental profile of their manufacturing processes, which may allow retailers and distributors to more effectively market the products against competing alternatives.

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1.1 Introduction

Thermally-modified wood is currently used primarily for solid wood flooring, external cladding, and decking products. Thermal modification processing imparts advantageous properties in wood, including attractive darker color, reduced equilibrium moisture content (EMC), reduction of mass, degradation of water-binding hemicelluloses, and elimination of many volatile organic compounds (VOCs) (Sinoven et al., 2002; Hakkou et al., 2005; Kocaefe et al., 2008; Repellin & Guyonnet, 2005). The result is a high-value, high-performing solid wood product with increased moisture resistance, decreased swelling and shrinkage due to weathering and atmospheric moisture changes, and increased resistance to degradation from rot-inducing fungi. Thermal modification can also reduce environmental impacts of wood products because it is an alternative to chemical preservatives, such as creosote, chromated copper arsenate (CCA), and acid copper chromate (Younsi et al., 2006).

Universities, national laboratories, and industry have completed a range of scientific studies and technology development for thermally-modified solid hardwood, softwood, and more recently, engineered wood products. It is important to note that thermal modification is not the same as traditional wood drying; drying is a collection of techniques used to remove water from wood to prevent deformation of wood products in service and undesirable biochemical

reactions and microbiological growth (Pang et al., 1994; Pang, 1998; Fhyr & Rasmuson, 1997). Thermal modification, however, alters the physical and chemical composition of the wood. This scientific background, a summary of which is described below, has laid a foundation for the future development and continued growth of the thermally-modified wood industry in North America.

While substantial life-cycle assessment (LCA)-developed environmental impact data exist for a wide range of wood products, there is very little published data on the environmental impacts of thermally-modified wood. In fact, there are only four known publicly-available LCA studies completed on thermally-modified wood (all completed in Europe). There is also very little life-cycle cost data regarding the manufacture and use of any type of thermally-modified wood product. What little data that do exist are preliminary production cost estimates provided by designers, manufacturers, and sellers of wood thermal-modification kilns as well as some dated production cost estimates for four major European wood heat-treatment methods (Rapp, 2001).

1.2 Justification for the Proposed Research

Since 1994, when researchers in Finland began to investigate the industrialization of thermally-modified wood, the range of applications and production volumes for these products have substantially increased in Europe, and are steadily growing in the U.S. As with many new technologies, however, this growth is not without challenges. While there are some publicly-available

environmental performance data, unsubstantiated claims on the performance of these products still exist. Current producers and retailers of thermally-modified wood often advertise their products as being environmentally-friendly alternatives to traditional materials (Espinoza et al., 2015); however, these claims are largely unsubstantiated, considering that the environmental impacts of their manufacture are still largely unknown and there is a relative lack of formal studies reporting the life-cycle environmental impacts of the products. In addition, environmental impacts of thermal-modification processing and utilization of the products are not included in the development of treatment processes (Kutnar & Sandberg, 2014). Some, such as Sandberg & Kutnar (2015), have even questioned, “Do we really know if the global environmental impact of thermal based timber processing and further uses of the resulting products is comparable with the impact of native, untreated wood?”

Such partially-unsubstantiated claims are not uncommon in the building products industry. In the exterior decking market, for example, non-wood substitutes continue to take market share from wood products due, in part, to their perceived superior durability and environmental friendliness (Ganguly et al., 2010). Also, other sellers make generic, unsubstantiated cost-related claims, such as having a “very low life cycle cost” (Green Design Build, 2012).

Thermal modification uses controlled heating of lumber in a low- or no-oxygen environment to impart advantageous properties, including increased moisture

resistance, improved dimensional stability, and increased resistance to rot/decay. Thus, these products may be considered viable alternatives to more-traditional competing products, such as preservative-treated wood, imported tropical hardwoods, polyvinyl chloride (PVC), and wood-plastic composites (WPCs). However, the success of thermally-modified wood in the U.S. has been very limited due, in part, to insufficient marketing efforts. Despite advantages over competing materials, there is little U.S. manufacturing of thermally-modified wood. There are 118 producers in Europe and Russia alone, but only 10 in the U.S. (Scheiding, 2014). In addition, total European production of thermally-modified wood in 2013 was 119 million board-feet (MMBF) (Scheiding, 2014; International Thermowood Association (ITWA), 2015). Despite rapid growth in Europe and Asia, lack of proper quality assurance and marketing strategies are impeding U.S. growth (Scheiding, 2014). It is estimated that annual U.S. production of thermally-modified wood is 8.5 to 12.7 MMBF with a retail value of $47.5 to $71 million (Johnson, 2015). U.S. production is certainly low, considering the availability of U.S. timber and potential production capacity. Recent research also shows that U.S. producers of thermally-modified wood can successfully compete in domestic and international markets (Espinoza et al., 2015).

Despite favorable European LCA reports for thermally-modified wood (as described in the Literature Review, below), there are no known, publicly-available U.S.-developed academic LCA reports for such products (Aro, 2014a). Also,

there are no known publicly-available LCAs focused on thermal modification of wood utilizing the hygrothermal (i.e., closed) treatment process. While the use of LCA to evaluate building materials, such as wood, is not novel (Ortiz et al., 2009), its use to evaluate hygrothermally-modified solid wood – as described in this research – is novel. *It is clear that accurate and unbiased LCA studies of hygrothermally-modified wood products are necessary to advance wood thermal-modification technology in the U.S. and to help better inform manufacturers, retailers/distributors, and consumers*. With the valuable environmental impact data delivered by this study, new U.S. market opportunities may develop, which can create wealth and economic opportunity in rural communities (where much of the timber is harvested and processed) where the forest products sector has been hit especially hard with hundreds of thousands of job losses in recent years (Woodall et al., 2011; Smith & Guldin, 2012).

To address these challenges and capitalize on key opportunities for market growth, the main questions answered by this research are:

1. Does hygrothermally-modified softwood exterior decking have lower life-cycle environmental impacts than traditional alkaline copper quaternary (ACQ)-treated softwood exterior decking, based on selected LCA impact categories?
2. How can the LCA data and results be used to inform stakeholders of the environmental implications of thermally-modified wood production and utilization?

3. What changes can be made in the life-cycle of hygrothermally-modified wood to reduce key environmental barriers that may be limiting increased production and consumer demand in the U.S.?

In this study, a comparative LCA of thermally-modified softwood exterior decking and ACQ-treated softwood exterior decking was completed following International Organization for Standardization (ISO) 14040 (ISO, 2006a) and 14044 (ISO, 2006b) guidelines. A full set of life-cycle impacts were included in the LCA.

The outcome of this LCA research is a detailed, comparative assessment of the environmental impacts of both products from cradle-to-grave, including extraction of materials and fuel used for energy; manufacture of the products; transportation of materials and components; assembly/construction/installation; operation (including energy consumption, maintenance, and repair); and end-of-life. The LCA allows for a direct comparison of the two competing products based on a consistent methodology.

1.3 Literature Review

This section describes thermally-modified wood technology, including its development and commercial availability. A description of the products' key properties is provided, along with details on all known LCA reports and related environmental impact data.

1.3.1 Thermal Modification of Solid Wood

The first prominent work (Stamm et al., 1960) heated solid wood from 93 – 160 degrees Celsius (°C) in a vacuum; the wood was also submerged in a bath of molten tin, lead, and cadmium. The technique increased dimensional stability, but decreased some mechanical properties. Modern thermal modification of wood, a collection of well-known processes, subjects wood to heat (typically 130 – 240°C) for up to 60 hours in specialized kilns, usually in a reduced-oxygen, inert environment. This imparts potentially advantageous properties, including lower EMC and mass, degradation of water-binding hemicelluloses (Sinoven et al., 2002; Hakkou et al., 2005; Kocaefe et al., 2008), and elimination of many VOCs. The result is a high-value, solid wood product with increased moisture resistance, decreased swelling and shrinkage due to weathering and atmospheric moisture changes, and increased resistance to biological degradation (Esteves et al., 2006; Rapp & Sailer, 2001; McKeever et al., 2009).

The change in performance properties is determined primarily by the wood species, wood physical properties, selection of kiln appliance, and intensity of the heat-treatment cycle, where intensity is a function of time, temperature, atmospheric conditions/air composition inside the kiln, wood heating and cooling rates, and moisture content of the wood (Nuopponen et al., 2003; Wang & Cooper; 2005, Boonstra et al., 2006). Figure 1 shows a simplified thermal-modification cycle for wood treated using the well-known ThermoWood® process.

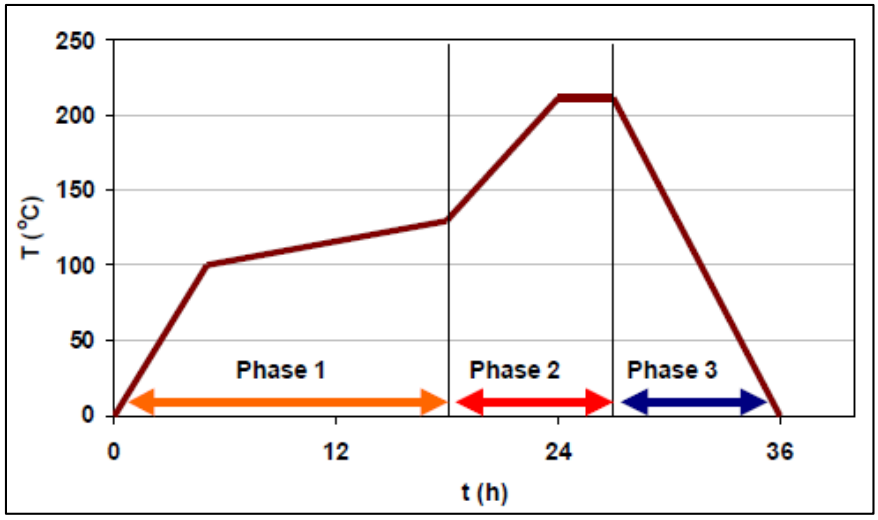


Figure 1. The ThermoWood® production process (Mayes & Oksanen, 2003).

Decrease in mass (caused by gasification of wood substances) has been described as an accurate measure of treatment intensity (Rapp et al., 2003; Del Menezzi & Tomaselli, 2006), and is correlated with other key properties, including reduced swelling and shrinkage, resistance to fungal attack, and mechanical strength (Stamm et al., 1946; Obataya et al., 2002; Mazela et al., 2004; Repellin & Guyonnet, 2003). Determination of the degree of wood modification is important for future acceptance and growth of thermally-modified wood markets in North America, as noted in American Wood Protection Association (AWPA) *Guidance Document N* (AWPA, 2013). Decrease in mass and level of hemicellulose decomposition have, historically, been used by many as quality control metrics and methods to determine degree of wood modification. More recently, others have examined the use of electronic spin resonance (ESR) spectroscopy to determine degree of wood modification and to establish a viable product quality control metric. ESR can identify changes in free radical levels in the wood due to thermal-modification processing, which have been shown to

correlate with degree of modification and durability (Militz & Altgen, 2011; Altgen et al., 2012). A summary of the physio-mechanical changes in thermally-modified solid wood is presented below.

Equilibrium Moisture Content and Dimensional Stability

Thermal modification converts hydrophilic hydroxyl (-OH) groups to C – O – C ether cross-links between wood fibers, decreases and/or eliminates hemicelluloses and converts them to much-less-hygroscopic furan-based polymers (Ibach, 2010), and reduces wood fiber polymerization (Tremblay, n.d.). These changes reduce water penetration, thus preventing swelling and shrinking while reducing EMC (Stamm & Harris, 1953). Previous work (Tjeerdsma et al., 1998; Boonstra et al., 1998) revealed an average decrease in hygroscopicity of 40% and a 40 – 60% reduction in EMC (Ohlin Thermo Tech, 2010; Welzbacher et al., 2007; Jämsä & Viitaniemi, 2001; Paul et al., 2006; Syrjanen & Kangas, 2000), which increases dimensional stability (Wang, n.d.; Kamden, 2002). The University of Minnesota Duluth Natural Resources Research Institute (UMD NRRI) (Donahue et al., 2011) has shown that higher treatment temperatures impart greater dimensional stability in some species.

Resistance to Biological Decay

Increased resistance to biological decay is due to the loss of hemicelluloses and other sugars (Ibach, 2010). Thermally-modified jack pine had reduced mass loss via attack by *C. versicolor* and *G. trabeum* fungi as treatment temperatures

increased from 190 to 212°C (Tremblay, n.d.). UMD NRRI has shown (Donahue et al., 2011) that unmodified basswood experienced 40.1% and 78.4% mass loss when exposed to *T. versicolor* and *G. trabeum* fungi, respectively. This improved to 17.9% and 18.7% mass loss, respectively, when the basswood was thermally modified at 210°C. Similar results were found with yellow poplar. Resistance to termites and other insects has not been shown. In addition, long-term ground-contact applications are not recommended due to potentially severe losses in mechanical strength.

Color Change

Thermal modification darkens wood evenly throughout its entire thickness, often mimicking valuable tropical hardwoods. This can increase the products' value (Bekhta & Niemz, 2003; Tomek, 1966). It was found that treatment temperature is directly correlated to increased color change (Bourgois et al., 1991; Mitsui et al., 2001; Sundquist, 2004; Johansson & Moren, 2006; Brischke et al., 2007). Some argue that color change can be used to accurately determine degree of wood modification; however, as previously noted, other methods (such as ESR spectroscopy) may be more suitable.

Mechanical Properties

Modulus of rupture (MOR) (bending strength) typically decreases at higher treatment temperatures (Kocaefe et al., 2008; Kubojima et al., 2000; Boonstra et al., 2007; Bekhta & Niemz, 2003), but some species become harder and exhibit

MOR increases at lower temperatures. Modulus of elasticity (MOE) (bending stiffness), however, can decrease or even increase slightly, depending on treatment intensity. UMD NRRI showed (Donahue et al., 2011) a slight MOE increase for yellow poplar and basswood treated at 200°C and 210°C, and a 9.5% hardness increase in basswood treated at 200°C. However, hardness decreased at 210°C. Other work (Ates et al., 2009; Santos, 2000; Poncsak et al., 2006; Shi et al., 2007; Unsal & Ayrilmis, 2005) showed that most mechanical properties decrease with increasing treatment intensity. UMD NRRI (Donahue et al., 2011) found a 48% reduction in internal bond strength of basswood treated at 210°C, and 56% and 47% reductions in splitting strength of basswood and yellow poplar, respectively, at 210°C. There were 51% and 21% reductions in screw-holding strength of yellow poplar and basswood, respectively, treated at 210°C.

Few researchers have assessed fire performance of thermally-modified solid wood. It has been claimed that thermal modification reduces and/or crystallizes the resins in some softwoods (Tran, 2005), which may reduce flammability. Thermal modification could also be considered a pre-charring technique that makes wood more difficult to ignite when large heat fluxes are applied (Babrauskas, 2003). However, Morozovs et al. (2007) showed that flammability of oak and ash increased when thermally modified using a two-step process of four hours at 140°C in an argon atmosphere followed by four hours at 195°C in a nitrogen atmosphere. Östman et al. (2006) showed that thermally-modified spruce could be impregnated with fire-retardant solutions; however, they did not

prove that fire retardant-impregnated spruce could be thermally modified. Some manufacturers of thermally-modified solid wood, however, claim few – if any – negative changes in fire performance when compared to non-treated wood (NFP, 2011). It is clear that more work must be done to assess and improve fire performance.

Adhesive Bonding of Thermally-Modified Solid Wood

Thermal modification causes mass loss, which can lead to changes in properties that affect wood bonding. Improved dimensional stability enhances bond performance, because stresses due to shrinking/swelling on the cured adhesive are reduced (Sernek et al., 2008). However, many other altered properties can reduce bond strength; thus, it is difficult to determine whether bond strength decreases because of insufficient bonding or due to reduced strength of the modified wood fibers (Kariz & Sernek, 2010). Also, because the wood is less hygroscopic, distribution of adhesive on the wood surface as well as penetration into the wood structure can be affected. Most adhesives contain water as a solvent, which can affect adhesive penetration due to the hydrophobicity of the thermally-modified wood; poor penetration can lead to reduced surface contact for chemical and/or mechanical bonding. Adhesives can also overpenetrate the wood structure because of limited capacity of thermally-modified wood to absorb water from the curing adhesive bondline (Vick & Rowell, 1990); thus, the adhesive may stay mobile for longer. In addition, it is known that the amount of adhesive penetrated into wood is correlated with bond quality (Kamke & Lee,

2007). Suggestions for improving bond performance include minimizing the water content of the adhesive, using methylene diphenyl diisocyanate (MDI) adhesives with longer open times (Kariz & Sernek, 2010), and increasing the pressing time (Mayes & Oksanen, 2003).

1.3.2 Thermal Modification of Engineered Wood

While thermal modification of solid wood has been well studied, the impacts of thermal-modification processing on engineered wood products, such as plywood, oriented strand board (OSB), and structural composite lumber, have not been as intensely examined. UMD NRRI (Donahue, 2011) found that MOR and MOE of aspen plywood thermally modified as a post-treatment at 190°C increased 5.8% and 27.9%, respectively, while MOR and MOE declined for thermally-modified birch, pine, and gum plywood. All species showed a marked improvement in linear expansion (up to 54.9%) and volume swell (up to 71.0%). Internal bond strength decreased an average of 42.8% for the aspen, birch, and gum plywood, and increased 36.8% for pine. Hardness dropped an average of 23.9%. UMD NRRI (Donahue & Aro, 2010) also found that OSB panels thermally modified as a post-treatment at 190°C yielded 24.1%, 6.5%, and 39.7% improvements in length, width, and thickness swell, respectively. There was a 6.2% reduction in MOR, but larger decreases in internal bond strength and split resistance. Boonstra et al. (2006) found improved water absorption and swelling and increased wet internal bond strength for particleboard panels made from thermally-modified Norway spruce and Scots pine chips. They concluded that

thermal modification of wood particles has potential to improve the dimensional stability of panel products. Similar results were found by Borysiuk et al. (2007).

Chotchuay et al. (2008) examined oriented strand lumber from Parawood strands thermally modified at 190°C, and found compression (39 Megapascals (MPa)) and tensile strength (36 MPa) parallel to the grain, and flatwise (59 MPa) and edgewise bending (61 MPa), were significantly higher than untreated controls. There was no significant difference in compression (26 vs. 25 MPa) and shear (4 vs. 3 MPa) parallel to the grain, nor internal bond strength (0.48 vs. 0.47 MPa). Del Menezzi et al. (2009) thermally treated commercial pine OSB panels by pressing them in a hot-press at 190°C and 220°C for 12, 16, or 20 minutes. Dimensional stability, thickness swell, water absorption, and EMC improved, while MOR was the only mechanical property that degraded. A similar study (Del Menezzi et al., 2008) showed the panels had improved decay resistance. Similar results were reported elsewhere (Del Menezzi, 2008; Del Menezzi & Tomaselli, 2006; Okino et al., 2007; Bonigut & Krug, 2011).

Poncsak et al. (2007) prepared laminated lumber from thermally-modified yellow poplar, Scots pine, jack pine, and aspen lamellas bonded together. Shear strength of most samples was reduced 30 – 50%, but Scots and jack pine had only moderate decreases of 5% and 11%, respectively. The interfacial bonding for jack and Scots pine was much stronger than yellow poplar and aspen. A similar study (Sernek et al., 2007) examined thermally-modified spruce lamellas

and found no significant decrease in shear strength. Also, shear strength did not vary significantly with treatment temperature. Spruce laminated timbers thermally modified at 212°C for three hours had average reduced shear strength and delamination rates of 26.5% and 3.2%, respectively. Shear strengths were higher when the timbers were thermally modified after bonding versus thermally modifying the lamellas before bonding (Henriksson et al., 2009). Nazerian et al. (2011) studied laminated veneer lumber (LVL) prepared from beech, poplar, and maple veneers. The veneers were thermally modified at 120°C and 180°C for four hours at atmospheric pressure and were bonded into three-layer, 20 millimeter (mm) thick LVL. Water absorption, and thickness, tangential, and longitudinal swelling decreased with increasing temperature. The flatwise MOR of juvenile beech, maple, and poplar LVL decreased 45.5%, 45.7%, and 41.7%, respectively, and MOE decreased 41 – 53%. Similar results were found in laminates made from tali, iroko, and pine (Sahin Kol et al., 2009; Kohl et al., 2009). Aro et al. (2015) found that the MOE of LVL and laminated strand lumber (LSL) was not greatly impacted when hygrothermally modified as a post-treatment at a range of temperatures between 140°C and 180°C. However, MOR generally decreased with increasing treatment temperatures.

More recently, results of studies focused on hygrothermal modification post-treatments of OSB and two types of plywood at a range of temperatures between 140°C and 180°C have been reported (Aro et al., 2014; Aro, 2014a; Aro & Donahue, 2014). Plywood MOR and MOE decreased up to 54% and 22%,

respectively, at the 180°C treatment, while OSB MOR and MOE decreased up to 25% and 4.3%, respectively. Internal bond of plywood decreased with increasing temperature, while OSB experienced minimal change. Screw-holding strength of all panels was more adversely affected by increasing temperatures than nail-holding strength, with OSB experiencing 17% and 27% maximum reductions in nail- and screw-holding strength, respectively. Thickness swell of all panels improved with increasing temperature, with plywood exhibiting 41% and 77% improvements at the 160°C and 180°C treatments, respectively. Mass increase (when subjected to a 24-hour soak in 21°C water) of OSB decreased 12% at the 150°C treatment, after which values increased. These results suggest that hygrothermal modification post-treatments can improve the thickness swell and water absorption of plywood and OSB panels.

1.3.3 Commercial Availability of Thermal-Modification Technology

There are approximately 20 thermal-modification kiln providers in North America and Europe that offer “open” (non-pressurized) and “closed” (pressurized) technologies, and there are mainly 10 commercially-available technologies: the ThermoWood® Process (Finland), PLATO Process (The Netherlands), Oil Heat Treatment Process (Germany), Bois Perdure Process (France), Retification Process (France), IWT/Moldrup (Denmark), ThermoTreat 2.0 (Denmark), FirmoLin (The Netherlands), WDE Maspell (Italy), and the Westwood Process (USA). Detailed descriptions are available (Esteves & Pereira, 2009; Syrjanen et al., 2001). The most common brands are shown in Table 1. The choice of

equipment vendor and process technology depends on scale of operations, customer service expectations, energy systems employed, and end-use applications.

Company/Brand Name	Type of System	Country of Origin
Jartek, Luxhammar, Valutec	Open (ThermoWood®)	Finland, Finland, Sweden
Mahild Drying Technologies	Open	Germany
MEC Torrefaction	Open	Canada
Westwood	Open	United States
WTT	Closed	Denmark
FirmoLin Technologies	Closed	The Netherlands
Huber Holz	Closed	Austria
WDE Maspell	Vacuum	Italy

Table 1. Companies/brands offering thermally-modified wood technologies.

Each technology operates at approximately 130 – 240°C, but differs in terms of process, including kiln design; presence of a shielding gas; use of fresh (i.e., "green") or kiln-dried wood; and cycles of temperature, pressure, and time. Collectively, these parameters are used to create treating protocols or "recipes." The "recipe" for a product varies based on kiln volume; wood species, thickness, and shape; and desired end-use. In addition, there are a few thermo-hydro-mechanical (THM) technologies commercially-available in Europe. They include Calignum (Sweden) used for flooring, Panzerholz™ (Germany) used for security panels and electrical transformers, and Dehonit® (Germany) used for high-strength thermal insulation and support structures, machine dyes, hand rails, and skid plates.

Several U.S. and foreign intellectual property disclosures describe wood thermal modification. U.S. patent nos. 6,083,437 (Nishio et al., 2000), 7,836,924 (Park & Wilderman, 2010), 7,246,452 (Roy, 2007), and 8,453,343 (Emery et al., 2013) claim dimensionally stable heat-treated wood products. Related inventions are also described (Laitinen et al., 2011; Viitaniemi et al., 1995; Viitaniemi et al., 1994a; Viitaniemi et al., 1994b; Viitaniemi et al., 2001a; Fritschi et al., 2002; Rem et al., 1994; Ruyter & Arnoldy, 1994; Ruyter, 1995; Viitaniemi et al., 1997; Willems, 2013; Viitaniemi et al., 2001b; Viitaniemi et al., 2005).

1.3.4 Environmental Performance of Wood Products

The environmental performance of wooden building materials has been extensively studied and reported. In the 1970s, research and case studies were focused primarily on energy consumption during the production process, largely due to the oil crises (Boyd et al., 1976; Ressel, 1986). Installed wood products, when used appropriately, often have favorable environmental profiles when compared to functionally-equivalent products from other materials (such as concrete and steel), particularly in regard to non-renewable energy consumption, cumulated energy demand, potential contributions to the greenhouse effect, and quantities of solid waste (Werner & Richter, 2007). Also, the use of forest products in long-life applications (such as the built environment) allows for the possibility of extending the storage of atmospheric carbon dioxide (CO_2) (Kutnar, 2015). Because wood sequesters carbon as it grows, some consider it to be carbon-negative (thus, having a negative global warming potential (GWP))

(Peuportier, 2001; Bowyer et al., 2008; Taylor et al., 2011; EPA, 2015). Dias and Arroja (2012), however, argue that wood-based CO_2 emissions have been considered by many to be neutral since they are balanced by the CO_2 that is sequestered as trees grow, assuming that the forest is sustainably managed with no changes in land use. Others also argue that because wood is often incinerated or landfilled at the end of its useful life, the CO_2 balance will ultimately be neutral or positive (i.e., not carbon-negative) (Peuportier, 2001), or that there is not yet enough evidence to determine the actual greenhouse impact of wood products disposed in landfills (Ximenes et al., 2008). Regardless, the environmental impacts of wood compared to many competing building materials is often quite favorable (Gustavsson & Sathre, 2006; van der Lugt et al., 2006); this can be advantageous when marketing wood products to environmentally-conscious consumers.

Thermally-modified wood has been claimed as an eco-friendly alternative to wood treated with chromated copper arsenate (CCA) and acid copper chromate preservatives (Younsi et al., 2006), but most producers do not recommend long-term ground contact. Others report that thermally-modified solid wood can safely be used as boiler fuel at the end of its service-life, which can reduce net CO_2 emissions (Boonstra, 2008); this may provide for a better end-of-life strategy than landfill disposal. Work by UMD NRRI (Hagen et al., 2011) revealed that heat-treated wood has higher energy content per unit mass than non-modified wood, which is beneficial if the wood is burned as fuel at the end of its service-life.

However, although thermal energy can be recovered, wood incineration can cause increased acidification and eutrophication compared to incineration of PVC flooring (Werner & Richter, 2007). The increased acidification is primarily due to conversion of nitrogen oxides (NO_x) into acidic substances, with dryer wood generally producing more NO_x emissions. The increased eutrophication is also likely due to higher NO_x and nitrous oxide (N_2O) emissions, plus the total dissolved nitrogen and phosphorous in landfilled wood ash leachate (Beauchemin & Tampier, 2008; Assamoi & Lawryshyn, 2012).

1.3.4.1 Life-Cycle Assessment of Thermally-Modified Wood

Even though life-cycle assessment (LCA) techniques have been used extensively in the building and construction sector since 1990 (Taborianski & Prado, 2004; Fava, 2006), very few LCA studies have been completed for thermally-modified solid wood. Kutnar (2015) argues that even though many aspects of wood modification treatments are known, the fundamental influence of the process on product performance, the environment, and end-of-life scenarios remain unknown. Also, the global environmental impact of modified wood compared to native, untreated wood is not known. Thus, to contribute to a low-carbon economy and sustainable development, it is important to integrate wood modification process parameters, product properties, and environmental impacts.

Some manufacturers simply make undocumented claims that their product “may be the first truly green lumber resource that does not hurt the environment” (NFP,

n.d.a), while being an “environmentally friendly alternative to tropical hardwoods from endangered rainforests” (NFP, n.d.b). While energy consumption to produce modified wood is likely to be significant, it is not known if the improved properties during the use phase reduces the overall life-cycle environmental impacts (Kutnar, 2015). This presents a critical challenge for the introduction and growth of thermally-modified wood in new and/or emerging markets – such as the U.S. – where manufacturers and consumers are increasingly demanding products that offer reduced environmental impacts. Just as important, these environmental impacts must be determined using accurate, unbiased, and repeatable methodologies, and communicated in ways that consumers can understand.

There exist only four known publicly-available LCA studies on thermally-modified solid wood (these were completed in Europe). (There have been other proprietary LCA studies completed in Europe; these studies are typically completed by consultants for the manufacturers on an as-needed basis (Aro, 2014b; Kutnar & Sinha, 2013).)

A Finnish Executive Summary (Finnish ThermoWood Association, 2008) stated that the energy used to produce thermally-modified wood is nearly equal to sawn timber and preservative-treated wood, yet it has a longer service-life. This Executive Summary was based on an LCA of Finnish thermally-modified wood cladding (Tran, 2005). The LCA followed the ISO 14040 (ISO, 2006a) framework

and the study boundary included only the sawmill-to-disposal life-cycle. Growth of trees, removal of trees from the forest, kiln-drying of the softwood lumber, and land occupation/land use were not included in the system boundary. In this LCA, green and kiln-dried pine (*Pinus sylvestris*) and spruce (*Picea abies*) were thermally modified at two Finnish plants using the patented ThermoWood® process. (The ThermoWood® process is likely the most well-known and most widely-used wood thermal-modification technology in the world.)

The environmental impacts of these two types of thermally-modified wood were then compared to traditional preservative-treated wood (the preservative was described as a chromium-free organic salt) cladding using LCA methodology, based on various production scenarios. It was assumed that the cladding was shipped to London for installation. Two end-of-life scenarios were analyzed: (1) incineration with energy recovery, and (2) landfilling as municipal solid waste (MSW). The study included four- and eight-year maintenance intervals, where the cladding was recoated with a water-based white paint.

The author used *SimaPro v. 6.0* software (PRé Sustainability, 2017a) and the CML 2000 Impact Assessment method to estimate life-cycle impacts in the following impact categories: abiotic depletion, GWP over a 100-year time interval (GWP100), ozone layer depletion, human toxicity, fresh water aquatic ecotoxicity, terrestrial ecotoxicity, photochemical oxidation, acidification, and eutrophication.

In several impact categories, the ThermoWood® was comparable or superior to the preservative-treated wood. Both types of modified wood had a negative global warming impact, leading the author to state that "not only does ThermoWood® not contribute to global warming, instead it even plays a role in reducing the global warming effect by sequestering carbon dioxide from the atmosphere as it inherits the wood's natural property as a 'carbon sink.'" The largest impact from the ThermoWood® was abiotic depletion due to the use of natural gas and electricity required to operate the kilns. After normalization, the more significant impact categories were GWP, abiotic depletion potential, acidification potential, and freshwater aquatic ecotoxicity potential. Ozone layer depletion potential and photochemical oxidation potential were less significant in normalized scores (Finnish ThermoWood Association, 2008). The study concluded that "ThermoWood® has a potential of being a 'green' building material if consideration is made to the production as well as the use and disposal at the end of its life cycle using best available techniques" (Tran, 2005).

Another European LCA compared thermally-modified and unmodified maritime pine boards in Portugal (Ferreira et al., 2014). This study utilized the ISO 14040 (ISO, 2006a) and 14044 (ISO, 2006b) methodologies. The maritime pine boards were thermally modified using the ThermoWood® process, with the LCA model assuming the boards would be used as exterior cladding for 15 years. The system boundary included the growth of pine roundwood, thermal-modification processing, and service as cladding. Because wood waste is generated, the

authors expanded the system boundaries to include firewood production and delivery; the avoided impacts from firewood production (and transport to the consumer) provided a negative value at the consumer. Pine boards and wood residue were the two co-products considered, and the researchers allocated environmental loads to these two co-products based on economic value. The authors also assumed that sawing, planing, and thermal modification of the boards took place in the same location, so no transportation was considered between these steps.

Inventory and impact analyses were completed using *SimaPro v. 7.3.3* software (PRé Sustainability, 2017b) and impact assessment was completed using the ReCiPe method (Goedkoop et al., 2013a). While the study assessed 18 impact categories, the authors only reported on the following seven categories that related directly to environmental product declarations (EPDs): climate change, ozone depletion, terrestrial acidification, freshwater eutrophication, photochemical oxidant formation, metal depletion, and fossil depletion. For the thermally-modified wood, the largest contributor to climate change impacts was liquefied petroleum gas (LPG) heat and consumption of electricity during the thermal-modification process. The electricity consumed during thermal modification also contributed the most to ozone depletion, terrestrial acidification, and freshwater eutrophication. Fossil depletion was primarily due to LPG use and electricity consumed during thermal modification.

When both types of cladding were compared in normalized damage categories using the ReCiPe Endpoint (H) V1.08/Europe Recipe H/A/Normalisation method, it was shown that the thermally-modified wood cladding was preferable to the unmodified cladding in the ecosystems damage category. However, the unmodified wood cladding performed slightly better in the resources damage category. Both claddings were essentially equal in the human health damage category. Based on these model outputs, the authors concluded that thermally-modified maritime pine cladding is more environmentally friendly than unmodified cladding. However, this does not hold true if a very high weight (close to 100%) is given to impacts on human health and resources, while a very low weight (close to 10%) is given to ecosystem damage impacts (Ferreira et al., 2014).

A very similar study by the same authors reported the cradle-to-gate life-cycle impacts of Atlanticwood® pine boards manufactured in Portugal using the ThermoWood® process. This study utilized *SimaPro v. 8.4.0* software (PRé Sustainability, 2017c) and the EPD v. 1.01 impact assessment method (Ferreira et al., 2015). Another partial LCA study also revealed that the production phase of sawn pine wood thermally modified using the ThermoWood® process had an additional 15-25% increase in primary energy demand when compared to non-modified sawn pine. The researchers also reported that the ThermoWood® pine had higher GWP, photochemical ozone creation potential, acidification potential, eutrophication potential, and fossil abiotic depletion potential (Linkosalmi et al., 2015).

Marra et al. (2015) recently reported a cradle-to-grave LCA describing the environmental impacts of softwood timber cladding modified using the ThermoVacuum process. This patented modification process treats wood in a partial vacuum via forced heat convection. When analyzed using the ReCiPe v1.12 impact assessment method, the ThermoVacuum cladding had higher ozone depletion potential, photochemical oxidant formation potential, and ionizing radiation potential at the midpoint level than both untreated and preservative-treated wood cladding. However, the ThermoVacuum cladding performed better than the untreated and preservative-treated cladding when compared on the human toxicity, freshwater eutrophication, freshwater and marine ecotoxicity, and metal depletion impact categories. When scrutinized using endpoint characterization, the ThermoVacuum cladding had 60% less human health impact potential than the preservative-treated wood, 55% less ecosystem damage potential than the untreated cladding, and 10% less resource impact potential than the preservative-treated cladding. It was not reported if this study was completed according to the ISO 14040 (ISO, 2006a) and 14044 (ISO, 2006b) methodologies.

The less-well-known “closed” process (also called hygrothermal processing) uses pressurized steam and acid hydrolysis to modify the wood. In a closed system, water evaporated from the wood remains in the kiln as high-pressure steam, acting as a heat-transfer medium and as a shield to protect the wood from excess oxidation. Wood degradation products also remain in the kiln, affecting

chemical changes in the wood, including accelerated degradation of the wood cell wall (Stamm, 1956; Hill, 2006). There are only a few commercially-available kiln systems available for processing wood using the closed process; however, it can potentially provide some technical advantages over the open processes, such as shorter cycle times and lower operating temperatures. There are no known, publicly-available LCAs completed on wood modified using the hygrothermal process.

1.3.4.2 Opportunities to Verify Environmental Performance

Werner & Richter (2007) argue that generation and maintenance of reliable life-cycle inventories (LCI) along the wood chain of new processes and technologies, including modified wood, is a critical activity to integrate life-cycle thinking and redirect material and energy flows into more sustainable pathways. Kutnar (2015) states that the role of the nascent European Cooperation in Science and Technology (COST) Action FP1407 is to characterize the relationship between wood modification processing, product properties, and the associated environmental impacts in order to maximize sustainability and minimize environmental impacts of the whole life-cycle of a product. COST Action FP1407, which includes research and industrial partners from 24 European countries and 5 COST collaboration countries, is also focused on the optimization of modification processing and quantification of impacts of emerging

modification technologies compared to traditional processing and alternative materials, with the goal of maximizing sustainability and minimizing environmental impacts.

Applying LCA as a holistic assessment of building products within the building sector can also be very important in achieving sustainable development goals (Curran, 1996; Ortiz et al., 2009). More recently, LCA of wood products can be based on accurate and extensive LCI data for forestry processes and the production and use of wood products (Schwaiger et al., 2001; Werner et al., 2003; Lippke et al., 2004). Further, various end-of-life scenarios can be modeled to provide stakeholders a more complete picture of the impacts of their waste disposal, recycling, and reuse decisions. Sandberg and Kutnar (2015) argue that, as sustainability becomes a greater concern for producers and consumers of construction materials, the environmental impacts should be included in planning by considering life cycles and embodied energy of the materials utilized, stating further that LCA is the key tool that should be used.

Chapter 2. METHODOLOGY

This study was performed using LCA methodologies described by ISO 14040 (ISO, 2006a) and 14044 (ISO, 2006b), including the following phases: (1) Goal and scope definition, (2) Inventory analysis, (3) Impact assessment, and (4) Interpretation. These phases are iterative since the individual phases use results from the other phases, as illustrated in Figure 2.

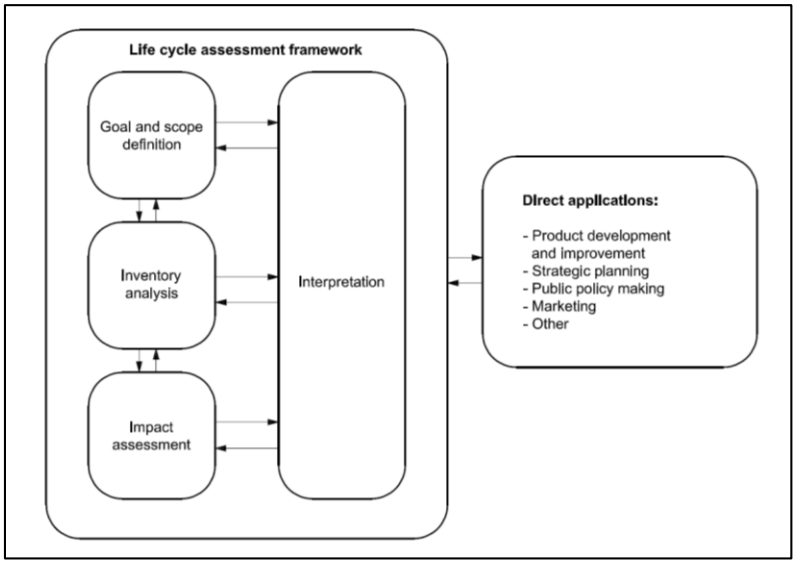


Figure 2. Iterative phases of an LCA study (ISO, 2006a).

2.1 Goal and Scope Definition

2.1.1 Goal of the Study

The goal of this study was to quantify, interpret, and compare the potential environmental impacts of hygrothermally-modified and ACQ-treated softwood decking on a cradle-to-grave basis. Each of these products is designed for above-ground (i.e., non-ground contact), exterior exposure use. This

assessment inventoried the life cycle of both products, from extraction of raw materials, through processing, manufacturing/assembly, transportation, use as exterior decking, and end-of-life treatment/final disposal. End-of-life was modeled using various choices. This study was modeled using *SimaPro v. 8.4.0* software (Pré Sustainability, 2017c).

2.1.1.1 Intended Application

This study inventoried the two competing products' material and energy inputs and emission and material outputs; the potential environmental impacts of each was then calculated and compared. The ACQ-treated decking was considered a "baseline product" as it is a widely-known and -used exterior decking product, which makes it easier to understand the potential environmental impacts of the less-well-known hygrothermally-modified decking.

2.1.1.2 Reasons for Carrying out the Study

Since there are no known, publicly-available LCAs on hygrothermally-modified wood products, this study's results can be used to help expand industrial production of these innovative products, as well as potentially provide valuable data that consumers can use when making material purchasing decisions.

2.1.1.3 Intended Audience

The intended audience for this study includes current manufacturers of thermally-modified wood, wood products industry manufacturers, public wood products

stakeholders, academia, and consumers. The intent is to provide critical and accurate environmental impact data to support decision makers and expansion of thermal-modification technology, particularly in the U.S.

2.1.1.4 Dissemination of Results

Since this is an academic study, the results are not intended to be used in public comparative assertions between the two competing decking products.

2.1.2 Scope of the Study

The scope of the study describes how the details of the study are sufficient to address the stated goal. The scope of this LCA included the following (ISO, 2006a):

- Product systems to be studied;
- Functions and functional unit of the product systems;
- System boundaries;
- Cut-off criteria;
- Allocation and recycling procedures;
- Impact categories selected, methodology of impact assessment, and subsequent interpretation used;
- Data requirements;
- Assumptions;
- Limitations;

- Initial data requirements; and
- Type and format of the report.

2.1.2.1 Product Systems to be Studied

The product systems analyzed in this LCA included hygrothermally-modified softwood decking and ACQ-treated softwood decking. Both systems were assessed on a cradle-to-grave basis.

2.1.2.2 Function and Functional Unit of the Product Systems

The function of the decking products is to provide a residential deck surface for consumer use. The average representative deck surface was assumed to be 20-feet by 16-feet (320 square-feet (ft^2)). A functional unit identifies the primary function(s) of a system based on which alternative systems are considered functionally equivalent (ISO, 2006a). This facilitates the determination of reference flows for each system, which in turn facilitates the comparison of two or more systems. Based on the identified function, the following functional unit was used to determine the reference flows: 320 ft^2 of decking surface for a period of 25 years.

2.1.2.3 System Boundaries

System boundaries are established in LCA to include the significant life-cycle stages and unit processes, as well as the associated environmental flows in the analysis. This lays the groundwork for a meaningful assessment where all

important life-cycle stages, and the flows associated with each alternative, are considered. The system boundaries also define which portions of the life-cycle stages are excluded from the analysis. Included in the system boundary of this study were:

- Material and fuel consumption for softwood lumber production, including stacking, strapping, and packaging of lumber;
- Material, water, transportation, and energy consumption for production of ACQ preservative and the two deck sealer products;
- Material and energy consumption for ACQ-treated wood and thermally-modified wood production;
- Materials and transportation required for installing and maintaining the decks; and
- Environmental impacts of landfilling the ACQ-treated wood deck at end-of-life, as well as landfilling or incinerating the thermally-modified wood deck at end-of-life.

The process flow diagrams for the ACQ-treated wood decking and thermally-modified wood decking are presented in Figures 3 and 4, respectively.

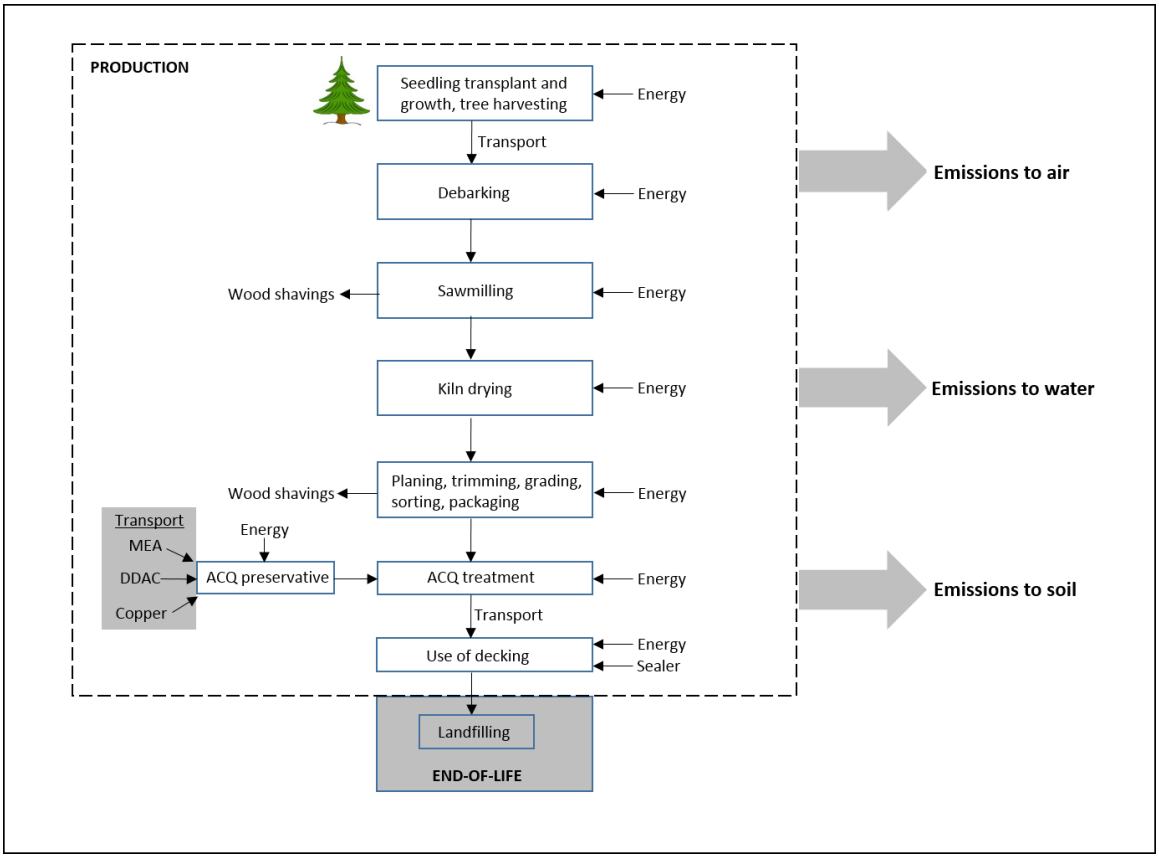


Figure 3. Process flow diagram for ACQ-treated wood decking.

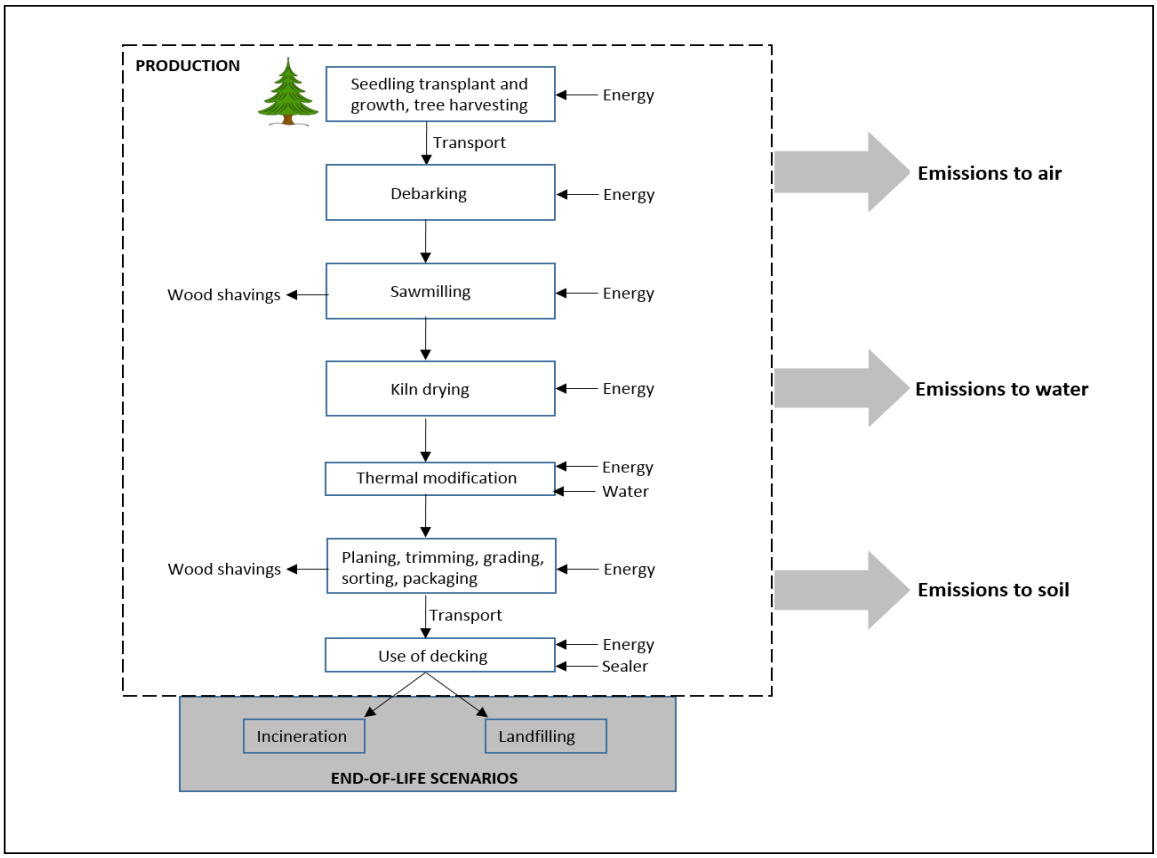


Figure 4. Process flow diagram for thermally-modified wood decking.

Packaging of sealers and ACQ preservative was excluded from the study. Typically in an LCA, some aspects within the set boundaries are excluded due to statistical insignificance or irrelevancy to the goal and scope. Thus, the following impacts were also excluded from the scope and boundaries for this study:

- Human activities (e.g., employee travel to and from work);
- R&D (i.e., the laboratory and inputs related to the development of the technologies);
- Capital equipment (and related maintenance) used in manufacturing the input materials and products, including logging/harvesting/forestry machines (unless noted otherwise).

However, the following infrastructure-related processes were included: processing equipment, such as debarking, sawing, pipes, and conveyors; and treatment equipment used for producing both the ACQ-treated wood and thermally-modified wood;

- Vehicles;
- Factory buildings; and
- Services (e.g., the use of purchased marketing, consultancy services, and business travel).

2.1.2.4 Cut-off Criteria

Cut-off criteria are often used in LCA practice for the selection of processes or flows to be included in the system boundary. The processes or flows below these cut-offs or thresholds were excluded from this study. Several criteria are used in LCA practice to decide which inputs are to be considered, including mass, energy, and environmental relevance. In the current study, every effort was made to include all the flows associated with the processes studied. During the interpretation phase, a 1% of environmental relevance criterion was used to test the sensitivity of the results to assumptions and data substitutions made.

2.1.2.5 Allocation and Recycling Procedures

While conducting an LCA, if the life cycles of more than one product are connected, allocation of the process inputs should be avoided by using the

system boundary expansion approach. If allocation cannot be avoided, an allocation method – based on physical causality (mass or energy content, for example) or any other relationship, such as economic value – should be used (ISO, 2006b). Allocation in this study was based on mass.

This study also used the cut-off approach method for recycling. According to this approach, the environmental burdens of primary production of materials (e.g., raw material extraction and processing) are allocated to the primary user of the material (i.e., the "first life"). When a material is recycled, the primary producer does not receive credit for the provision/use of recyclable materials. In other words, the "second life" bears the burden of refurbishment/recycling (e.g., collection and refining of scrap). The burdens from waste treatment are taken by the life after which they occur (Frischknecht, 2010).

2.1.2.6 Impact Categories, Impact Assessment, and Interpretation

Impact assessment methods are used to convert LCI data (i.e., environmental emissions and raw material extractions) into a set of potential environmental impacts resulting from the production and use of a product or system over its life cycle. ISO 14044 (ISO, 2006b) does not dictate which impact assessment method(s) to use for a comparative assertion; however, the chosen method needs to be an internationally-accepted method if the results are intended to be used to support a comparative assertion disclosed to the public.

For an LCA study to be ISO-compliant, the life-cycle impact assessment phase must include the mandatory elements shown in Figure 5. While the optional elements can be of value, they are not required per ISO.

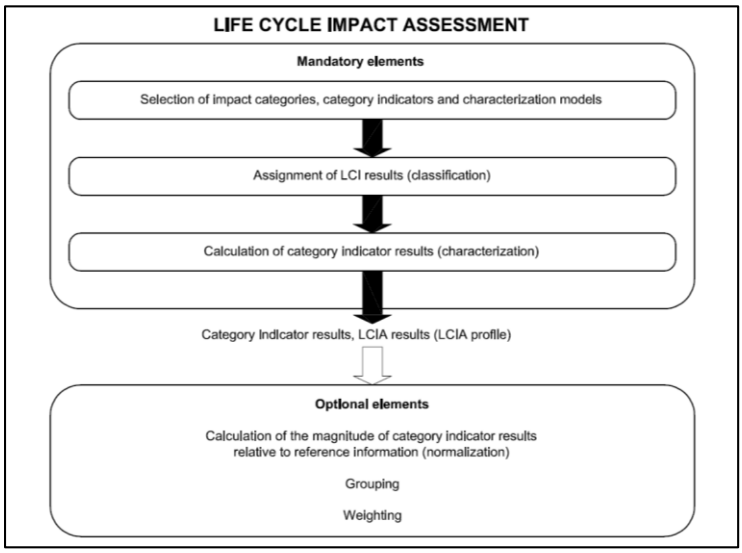


Figure 5. Steps of the life-cycle impact assessment phase (ISO, 2006a).

As described by Ayer et al. (2016), once the required inventory data were obtained and associated flows were normalized (based on the chosen functional unit), LCA modeling was carried out using *SimaPro v. 8.4.0* software (PRé Sustainability, 2017c). This study utilized the LTS Impact Assessment Method to translate the LCI data into environmental impacts, which combines the ReCiPe Endpoint (H) *v. 1.13* method (Goedkoop et al., 2013a) with two endpoint categories (human health and resources) and the cumulative energy demand (CED), climate change, and water use midpoint impact categories. In addition, selected midpoint category impact data were calculated using the ReCiPe Midpoint (H) *v. 1.00* method (Goedkoop et al., 2013a). ReCiPe is one of the

most robust and updated methods available to LCA practitioners, and presents impact data at both the midpoint and endpoint. The selection and presentation of midpoint and endpoint data typically depends on the availability of inventory data and the audience of the study.

The midpoint and endpoint impact categories selected for this study are shown in Table 2, below.

Impact Category	Midpoint/Endpoint	Unit	Method
Human Health	Endpoint	disability adjusted life years (DALY)[1]	ReCiPe Endpoint (H) *v. 1.13*
Resources	Endpoint	$/kg	ReCiPe Endpoint (H) *v. 1.13*
Cumulative Energy Demand	Midpoint	MJ	Cumulative Energy Demand *v. 1.09*
Climate Change	Midpoint	kg CO_2 eq.	IPCC 2013 100a *v. 1.03*
Water Use	Midpoint	$m^{3(2)}$	AWARE *v. 1.01*
Stratospheric Ozone Depletion	Midpoint	kg CFC11 eq.	ReCiPe Midpoint (H) *v. 1.0*
Ionizing Radiation	Midpoint	kBq Co-60 eq.[3]	ReCiPe Midpoint (H) *v. 1.0*
Particulate Matter Formation	Midpoint	kg PM2.5 eq.	ReCiPe Midpoint (H) *v. 1.0*
Terrestrial Acidification	Midpoint	kg SO_2 eq.	ReCiPe Midpoint (H) *v. 1.0*
Terrestrial Ecotoxicity	Midpoint	kg 1,4-DCB eq.	ReCiPe Midpoint (H) *v. 1.0*
Freshwater Ecotoxicity	Midpoint	kg 1,4-DCB eq.	ReCiPe Midpoint (H) *v. 1.0*
Marine Ecotoxicity	Midpoint	kg 1,4-DCB eq.	ReCiPe Midpoint (H) *v. 1.0*
Human Carcinogenic Toxicity	Midpoint	kg 1,4-DCB eq.	ReCiPe Midpoint (H) *v. 1.0*
Mineral Resource Scarcity	Midpoint	kg Cu eq.	ReCiPe Midpoint (H) *v. 1.0*
Fossil Resource Scarcity	Midpoint	kg oil eq.	ReCiPe Midpoint (H) *v. 1.0*

Table 2. Selected impact categories. [1]DALY is years of life lost * years lived disabled * quality of life (0 = optimum health, 1 = life lost). [2]AWARE represents the relative available water remaining per area in a watershed after the demand of humans and aquatic ecosystems has been met. It assesses the potential of water deprivation, to either humans or ecosystems, building on the assumption that the less water remaining available per area, the more likely another user will be deprived. [3]Equivalents of kilobecquerel of radioactivity from cobalt-60.

The impact assessment phase utilizes impact assessment methods to link the emission or extraction of a substance (e.g., CO_2 emissions, aluminum extraction) to its effect(s) on living organisms and ecosystems. The impact assessment methods rely on cause-effect research regarding the fate and transport of a substance once emitted (which is affected by the substance's mobility and persistence), possible exposure routes (e.g., inhalation, ingestion, absorption), and effects that are often based on dose-effect tests and toxicity data from

human beings and laboratory animals. Models of these cause-effect mechanisms are then used to create characterization factors (CFs) for substances. Figure 6 illustrates the cause-effect chain for various emissions and the relationship between midpoint and endpoint indicators.

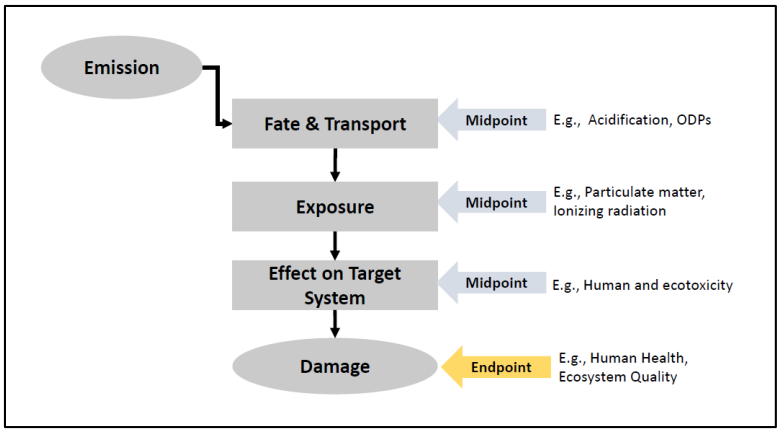


Figure 6. Cause-effect chain for emissions, and interrelationship between midpoint and endpoint indicators (Martin, 2015).

To aggregate substance emissions into the impact categories, substances are multiplied by their CF to convert into an equivalent substance (e.g., kg CO_2 eq., kg N eq.) and then added together to create a total score for each impact category (e.g., global warming potential) (Martin, 2015). Figure 7 presents a simple example of how CFs are used to convert substances to equivalents and impact scores.

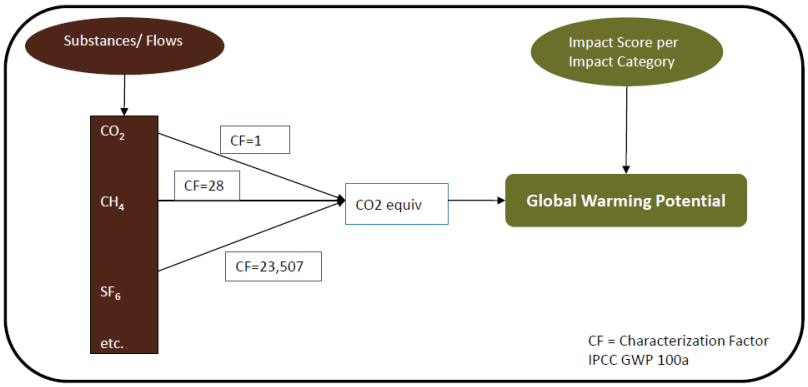


Figure 7. Example of using characterization factors to create impact category scores (Martin, 2015).

Midpoint indicators focus on single environmental impacts (e.g., acidification) and endpoint indicators show the environmental impact on higher aggregation levels, including effects on human health, biodiversity, and resource scarcity. Converting midpoints to endpoints simplifies the interpretation of LCA results, rendering them easier to interpret by non-LCA audiences; however, this does increase LCA uncertainty (RIVM, 2011). Figure 8 presents an overview of how the ReCiPe impact assessment method relates midpoint indicators to endpoint indicators, using the climate change impact category as an example.

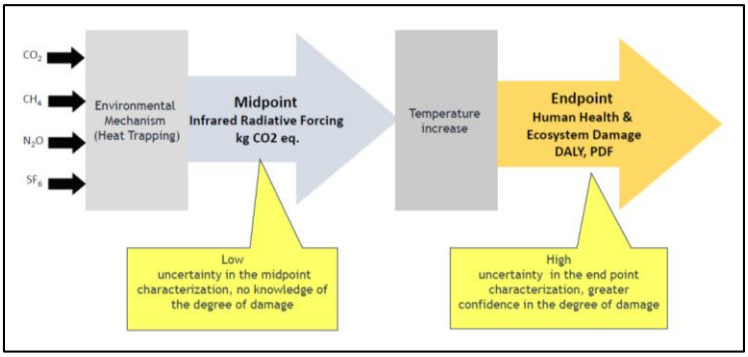


Figure 8. Relationship between LCI parameters (left), midpoint indicator (middle) and endpoint indicator (right) in ReCiPe (Goedkoop at al., 2009).

2.1.2.7 Data Requirements

This LCA utilized secondary data from previously-conducted studies as well as data collected from various databases, and primary data from ACQ preservative production processes and industry-provided data on commercial-scale hygrothermal-modification processes. Attempts were made to ensure that all data was accurate and collected from credible sources, or justified in its selection and use in this analysis. All data sources are cited in the body of this study, and full citations are listed in the Bibliography.

2.1.2.8 Assumptions

A summary of the assumptions used in this study is shown below.

<u>Softwood</u>

- Softwood was used for manufacture of the ACQ Type-D treated lumber (EPA, 2014) and thermally-modified wood decking.
- A reference dimension (per deck board) of 1.25-inch by 5.5-inch (nominal) by 16-feet was used for each of the competing decking products.
- The softwood lumber was dried to 12% moisture content and had an average density of 36.5 pounds-per-cubic-foot (lb/ft^3).
- The softwood lumber was grown and harvested in the U.S. Northeast (NE)/North Central (NC) region.

Thermal-Modification Treatment

- 283 ft^3 of softwood is thermally modified per kiln charge.
- Mass loss is 7%, on an oven-dry basis.
- The thermal-modification plant is located at the sawmill; thus, no transportation is required to ship planed boards to the thermal-modification plant.
- 1,585 gallons of cooling water is required for each 283 ft^3 charge of thermally-modified wood.
- 44.3 gallons of light heating oil is used in the boiler for each 283 ft^3 charge of thermally-modified wood.
- 235 kilowatt-hours (kWh) of electricity is used for each 283 ft^3 charge of thermally-modified wood.

Thermally-Modified Wood Deck Sealer

- The thermally-modified wood deck sealer was modeled after Tikkurila Valtti Puuoljy wood oil (Tikkurila, 2017).
- Naptha, ethylene glycol monoethyl ether, fatty acids from vegetarian oil, methyl ethyl ketone, and fungicides comprise 93%, 3%, 3%, 0.3%, and 0.5% of the sealer weight, respectively.
- Sealer components are shipped 500 miles to the manufacturing plant via diesel combination truck; one gallon of the sealer weighs 6.68 pounds (lbs).

ACQ-Treated Wood Deck Sealer Production

- The ACQ deck sealer was modeled after Penofin 250 VOC Pressure Treated Formula wood sealer (Penofin, 2017).
- Naptha, xylene, oleic acid, ethyl benzene, methyl ethyl ketone, magnetite, palm oil, and fungicide comprise 30%, 11%, 7%, 1%, 1%, 10%, 39%, and 1% of the sealer by weight, respectively.
- Sealer components are shipped 500 miles to the manufacturing plant via diesel combination truck; one gallon of the sealer weighs 8.68 lbs.

ACQ Preservative Production

- One lb of ACQ preservative contains 0.533 lbs of copper; a mix of virgin and recycled copper are shipped 1,000 miles to the ACQ preservative manufacturing plant via diesel combination truck.
- One lb of ACQ preservative contains 0.333 lbs of quaternary (DDAC). The DDAC components are shipped 500 miles from port to the DDAC manufacturing plant, and the finished DDAC is shipped 500 miles to the ACQ wood-treating facility. All transport is via diesel combination truck.
- One lb of ACQ preservative contains 1.83 lbs of monoethanolamine (MEA). Each lb of MEA requires 16 ft^3 of natural gas for processing and requires diesel combination truck, diesel train, and residual fuel oil-powered barge transport to ship the components to the

monoethanolamine production plant. It is also assumed that the monoethanolamine production site is a negligible distance from the ACQ preservative production plant.

ACQ-Treatment Process

- ACQ loading is 8.82 lbs per 83.33 ft^3 of softwood lumber, and ACQ retention is 85%, by weight.
- The ACQ-treated wood is delivered 500 miles from the ACQ-treating plant to the retailer via diesel-powered train.

Deck Installation and Maintenance

- Spacing was one deck board every six inches of deck surface.
- 1,047 steel, 3-inch screws are used per deck. Each screw weighs 5.85 g. A hand power drill consuming 0.364 kilowatt (kW) of power is used for 2 hours to drive the screws for each deck.
- Penofin sealer is applied to the ACQ-treated wood deck at the time of installation (Year 0), and at Years 5, 10, 15, and 20. Average application rate is one gallon per 275 ft^2 of deck surface. Tikkurila Valtti Puuoljy wood oil is applied to the thermally-modified wood deck at the time of installation, and also at Years 5, 10, 15, and 20. Average application rate is one gallon per 408 ft^2 of deck surface.
- The homeowner drives 20 miles round trip via automobile to purchase the sealer from a retailer for each of the five sealer applications.

Screws for installing the deck are purchased on the first trip. No other items are purchased.

- A diesel-powered, light commercial truck drives 20 miles round trip to deliver the deck boards to the install site. The truck returns empty to the retailer.
- Useable deck service-life was 25 years, and representative deck area was 320 ft^2. Material loss from sawing/trimming is not included.

2.1.2.9 Study Limitations

Care must be taken to ensure that the results of this LCA are properly applied. While this study models midpoint and endpoint impacts, there is inherent uncertainty in both. The uncertainty is due, in part, to complicated environmental fate and transport modeling of emitted substances and pollutants; biophysical effects of emitted substances and pollutants on humans (via inhalation, ingestion, and dermal absorption) and ecosystems; and the pollutants' actual effects on humans based on dose-effect tests. In additions, there are many environmental, atmospheric and geologic variables that must be taken into account. In general, endpoint impacts tend to be easier to understand than midpoint impacts, but they have higher uncertainty. Also, while a variety of midpoint and endpoint impact categories were assessed in this study, not all were included.

In addition, there are different technologies available for manufacturing thermally-modified wood materials. This study assessed the hygrothermal, pressurized

(i.e., “closed”) process only. It is likely that the LCA results would be different if a different thermally-modified wood manufacturing method was assessed. In addition, there are also other preservatives available for treating wood materials; this study only assessed ACQ.

Also, because the cut-off approach method for recycling was used in this study, recyclable materials are available burden-free to recycling processes and secondary (recycled) materials bear only the impacts of the recycling processes. Also, producers of wastes do not receive any credit for the recycling or re-use of products resulting from any waste treatment. Depending on the perspective of the stakeholder reviewing this study, it may be important that a certain actors(s) receives credit for recycling or bears the environmental burdens of recycling.

2.1.2.10 Initial Data Requirements

Great care was taken to identify data/data sources that were generated and published by credible organizations and made available to a wide variety of stakeholders. Also, this LCA utilized some industry data from Wood Treatment Technology (WTT/AS; Brande, Denmark), which was assumed to be accurate. This information included the electricity, fuel oil, and water consumption for the commercial-scale hygrothermal-modification process.

2.1.2.11 Type and Format of the Report

This report was prepared in a manner consistent with the guidance and principles provided in ISO 14040 (ISO, 2006a) and 14044 (ISO, 2006b). However, this report does not claim to be an ISO-approved document.

2.2 Inventory Analysis

Life-cycle inventory analysis (LCI) is the second phase of an LCA where data collection and calculation procedures were utilized to quantify the relevant inputs and outputs of the two wood decking products during each life-cycle stage. Inventories of flows to and from the environment and energy and material flows were calculated using the data collection procedures described below. Inventory development followed the method described by Bolin and Smith (2011a), and included defining the products; selecting a means to compile data; obtaining and developing applicable life-cycle data for all life stages; distributing environmental and material flows between the target, co-, and or by-products; and summarizing all flow data. All input and output flows were quantified using a functional unit of 320 ft^2 of decking surface for a period of 25 years.

SimaPro v. 8.4.0 software (PRé Sustainability, 2017c) was used to organize the LCI data. As described by ISO 14040 (ISO, 2006a), the data collection phase included:

- Energy inputs, raw material inputs, ancillary inputs, and other relevant physical inputs;

- Products, co-products, and waste;
- Emissions to air, discharges to soil and water; and
- Other environmental aspects.

The results of the inventory were calculated for each unit process and functional unit for both decking products. The calculation procedures included validation of data collected, relating of data to unit processes, and relating of data to the reference flow of the functional unit. As prescribed by ISO 14040 (ISO, 2006a), the calculation of energy flows took into account the different fuels and electricity sources used, efficiency of conversion and distribution of the energy flows, and the input and output attributed to the generation and use of those energy flows. In addition, allocation of environmental loads between processes, products, and co-products has been identified and the allocation procedures have been documented.

2.2.1 LCI Data Collection

As previously noted, only some primary LCI data was used in this study. A majority of the primary data for ACQ preservative production processes was provided by Bolin and Smith (2011b) from their survey of Treated Wood Council member companies; thus, the LCI data for the current study is quite similar to Bolin and Smith. Primary data for the hygrothermal-modification treatment process came from an industry source (WTT A/S). Secondary/background data for the growth and harvest of softwood, production of softwood lumber,

manufacture and use of deck sealers, and disposal/incineration of decks at end-of-life came from the *DATASMART LCI* database (LTS, 2016), the U.S. LCI Database (NREL, 2012), and *Ecoinvent v. 3.3* unit process database (Wernet et al., 2016).

2.2.1.1 Softwood Lumber Production

The majority of the softwood feedstock production data is from the U.S. LCI database (NREL, 2012) using the "*sawn lumber, softwood, planed, kiln dried, at planer, NE-NC/m3/RNA*" input from technosphere module. Reforesting activities were considered to be of average intensity. Included are seedling production/germination and planting, and growing and harvesting of softwood trees in the U.S. Northeast and Northcentral (NE-NC) region (excluding Connecticut, Delaware, Illinois, Iowa, New Jersey, and Ohio), based on operational data from six surveyed Northeast Lumber Manufacturers Association (NELMA) mills. It also includes average transport distance of harvested trees to the sawmill site in the NE-NC region; stickering and/or unstacking of lumber; planing of the kiln dried lumber; trimming, grading, and sorting of lumber; stacking, strapping, and packaging of lumber; transportation of lumber within the planer operation and loading for shipping; maintenance of all planer equipment and associated yard transportation vehicles; and treatment of process air, liquids, and solids.

For purposes of LCA modeling, this process input was based on the volume of a single softwood board that was 1.25-inch by 5.5-inch (nominal) by 16-feet, which is an equivalent volume of 0.764 ft^3. The volume of the board was converted to mass using an average density of 36.5 lb/ft^3 (using shortleaf pine at 12% moisture content as a proxy) (CSUDH, 2017).

The major LCI processes for softwood production are shown in Table 3.

Description	LCI Data Source	Quantity	Unit
Inputs from technosphere: materials/fuels			
Sawn softwood lumber	Sawn lumber, softwood, planed, kiln dried, at planer, NE-NC/m3/RNA	0.764	ft^3
Diesel	Diesel, combusted in industrial equipment/US	8.98×10^{-3}	L
Gasoline	Gasoline, combusted in equipment/US	1.67×10^{-4}	L
Inputs from technosphere: electricity/heat			
Electricity, at grid	Electricity, at grid, Eastern US, 2000/RNA U	0.369	kWh
Electricity, boiler	Electricity, onsite boiler, softwood mill average, NE-NC/kWh/RNA	0.062	kWh

Table 3. LCI data for one softwood board (5.5-inch by 1.25-inch by 16-feet) with a density of 36.5 lb/ft^3 at 12% moisture content.

2.2.1.2 Thermal-Modification Processing

Some LCI data for this process is from the *DATASMART LCI* database (LTS, 2016), which replaces links in the *Ecoinvent v. 2.2* (Frischknect et al., 2005) and U.S. LCI (NREL, 2012) unit processes with U.S.-specific inventory data, including electricity and natural gas mixes, to better reflect U.S. operations. Data on oil, water, and electricity consumption is from an industry source (WTT A/S) and is based on commercial-scale operational data (WTT, 2013).

As previously noted, this LCA studied the “closed” hygrothermal-modification process, which uses pressurized steam and acid hydrolysis to modify the wood. In a closed system, water evaporated from the wood remains in the kiln as high-pressure steam, acting as a heat-transfer medium and as a shield to protect the wood from excess oxidation. Wood degradation products also remain in the kiln, affecting chemical changes in the wood, including accelerated degradation of the wood cell wall (Stamm, 1956; Hill, 2006). Figures 9 and 10 show a commercial hygrothermal-modification plant.

Figures 9 and 10. Wood entering a commercial hygrothermal-modification plant (Klaas, 2016).

In this process, 283 ft^3 (3,930 board-feet (BF)) of softwood lumber enters the thermal-modification kiln and experiences 7% mass loss on an oven-dry basis. (A typical commercial-scale hygrothermal-modification kiln has a lumber capacity of approximately 250 to 333 ft^3.) The kiln diameter is 72 in and the length is 40 ft. The lumber stack length and width is 43.3 in, and the stickers have a minimum thickness of 0.24 in. It is assumed that the thermal-modification plant is located

on the site of the sawmill (which is typical in commercial thermal-modification operations), so no transportation of the planed boards to the plant is required.

As per real-world, electricity-consumption data from operation of the commercial kiln in Europe, each 35.3 ft^3 (424 BF) of wood requires 29 kWh of electricity for running the thermal-modification plant electrical motors. This electricity consumption was converted to 0.821 kWh/ft^3 of wood, which is equivalent to 0.627 kWh/softwood board. In addition, light fuel oil is used to heat the thermal oil, which is in turn used to heat the thermal-modification kiln by means of a burner. Production data showed that 20.9 liters (L) (5.52 gal) of light fuel oil is used to thermally modify each 35.3 ft^3 (424 BF) of wood. It was assumed that the energy content of the light fuel oil was 43.5 megajoules (MJ)/kg (FAO, n.d.) and the density was 0.96 kg/L (GCS, 2017). The fuel oil energy consumption was converted to 872 MJ/424 BF (or 18.9 MJ/board).

After the thermal-modification cycle has maintained the specified maximum treatment temperature for the designated period of time, a fine water spray mist is sprayed into the kiln to cool the lumber and kiln atmosphere. Each 283 ft^3 (3,396 BF) of wood requires 6,000 L (1,585 gal) of cooling water, which was converted to 16.2 L per board.

Waste heat was also included in the LCI for the thermal-modification process. The production-scale data revealed that 0.623 kilocalories (kcal) worth of the

inputted fuel oil is lost as heat to the atmosphere per ft^3 of wood. Based on a density of 0.764 ft^3/board, the heat loss was converted to 0.476 kcal/board.

Once the thermal-modification cycle is complete, the acidic condensate products remain in the kiln. It is challenging to describe the composition of these condensates as it varies considerably based on wood species, treatment temperature, treatment time, and pressure achieved. Some commercial-scale manufacturers combust these condensates for energy recovery considering the organic content of the condensate, while others dispose of them in the sanitary sewer for wastewater treatment, sometimes after treatment with a neutralizing agent (such as lime), assuming they have obtained approvals from their local jurisdictions. Previous, preliminary work by UMD NRRI (Kolomitsyn, 2016) qualitatively analyzed the composition of acid condensate produced from hygrothermal-modification of softwood tamarack (*Larix larcina*) at 170°C. The liquid condensate was extracted with diethyl ether ($C_4H_{10}O$), hexane (C_6H_{14}), and dichloromethane (CH_2Cl_2) prior to gas chromatography/mass spectrometry (GC/MS) and nuclear magnetic resonance (H^1-NMR) analysis. The analysis revealed large amounts of acetic acid (CH_3COOH) and methanol (CH_3OH), along with many other compounds in smaller amounts. A quantitative analysis was not conducted, nor did the analysis attempt to discover carbohydrate content. Quantitative analysis of the specific acid condensates produced from hygrothermal-modification of softwood lumber is beyond the scope of the current

study, however, considering it requires the completion of sophisticated and expensive analyses.

Considering that some commercial thermally-modified wood producers simply dispose of their acid condensates in the sanitary sewer, and given the lack of peer-reviewed condensate compositional data, in the current study the acid condensate was modeled as unspecified liquid wastes sent to wastewater treatment. Commercial-scale production data shows that 500 L (132 gal) of wastewater is produced per 283 ft^3 (3,396 BF) of wood. Since 6,000 L (1,585 gal) of cooling water is required per 283 ft^3 of wood per kiln charge, it was estimated that 8.33% of the cooling water is collected as wastewater.

Acidic gases are also produced from the thermal decomposition of wood substances, primarily hemicelluloses. It was assumed that the wood undergoes 7% mass loss (on an oven-dry basis) during the hygrothermal-modification processing and that these decomposition products were 100% organic gases that were emitted from the kiln stack during the process. In total, 722 lbs of organic acid gases are generated per 283 ft^3 kiln charge.

The major LCI processes for the thermal-modification processing are shown in Table 4.

Description	LCI Data Source	Quantity	Unit
Inputs from technosphere: materials/fuels			
Fuel oil	Light fuel oil, burned in boiler 100kW, non-modulating/US* US-EI U	18.9	MJ
Inputs from technosphere: electricity/heat			
Electricity, kiln	Electricity, at grid, US NREL/US U	0.627	kWh
Inputs from nature			
Cooling water	Water, cooling, unspecified natural origin, US	16.2	L
Emission to air			
Waste heat, emitted to air	Heat, waste	0.476	kcal
Acidic gases from decomposition of wood, emitted to air	Organic acids	1.95	lb
Outputs to technosphere			
Acidic condensates from decomposition of wood, to wastewater treatment	Proxy_Disposal, liquid wastes, unspecified to waste water treatment/l NREL/RNA U	1.35	L

Table 4. LCI data for thermal modification of one softwood board (5.5-inch by 1.25-inch by 16-feet) with a density of 36.5 lb/ft^3 and 12% moisture content. Kiln volume is 283 ft^3 and mass loss due to thermal-modification processing is 7%.

2.2.1.3 ACQ Preservative Production

The majority of the ACQ Type-D (EPA, 2014) preservative production data is from the study by Bolin and Smith (2011b) (based on their survey of Treated Wood Council member companies), published literature (LCC, 2009; Ayres et al., 2002), and the U.S. LCI database (NREL, 2012). As previously noted, one lb of ACQ preservative contains 0.533 lbs of copper, 0.333 lbs of quaternary (DDAC), and 1.83 lbs of monoethanolamine (MEA).

The LCI inputs for copper were based on the production of one lb of copper from a mix of virgin and recycled copper. The electricity use is 1.2 kWh and process water demand is 0.044 gal. It was assumed that the copper feedstock was

transported 1,000 miles to the ACQ preservative manufacturing plant, for a total transportation input of 0.5 ton-miles for each lb of copper. Also, 0.24 lbs of waste are produced for each lb of copper produced; this waste was assumed to be landfilled.

The LCI inputs for DDAC were based on production of one lb of DDAC. Natural gas (13 ft^3) was used as the carbon source feedstock. It was assumed that 198 ft^3 of natural gas was used to fire the plant boiler, and 0.10 kWh of electricity was required. In addition, the DDAC components were shipped 500 miles from port to the DDAC manufacturing plant, and the finished DDAC was shipped 500 miles to the ACQ wood-treating facility, resulting in 0.25 ton-miles of transport.

The LCI inputs for MEA were based on production of one lb of MEA. Natural gas (16 ft^3) was required as the carbon source feedstock, 4.4 ft^3 of natural gas was used to fire the plant boiler, and 7.9×10^{-6} and 8.7×10^{-6} gal of diesel and gasoline, respectively, were required to power the plant equipment. Also, 0.12 kWh of electricity was required to power the production process. Finally, 0.0062 ton-miles of diesel truck transport, 0.0052 ton-miles of diesel train transport, and 0.014 ton-miles of barge transport was required.

Electricity was also required to mix and heat all of the preservative components into the finished product. The electricity demand of 9.9×10^{-4} kWh per lb of finished ACQ preservative was estimated based on a previous study (Lippiatt, 2007).

The major LCI processes for the ACQ preservative production are shown in Table 5.

Description	LCI Data Source	Quantity	Unit
Copper			
Inputs from technosphere: materials/fuels			
Copper, feedstock	Copper, at regional storage/US- US-EI U	1.0	lb
Copper transportation, to copper plant, truck	Transport, combination truck, diesel powered NREL/US U	0.50	ton-mi
Inputs from technosphere: electricity/heat			
Electricity, in plant	Electricity, at grid, US NREL/US U	1.2	kWh
Inputs from nature			
Process water	Water, process, unspecified natural origin/m3	0.044	gal
Outputs to technosphere			
Plant waste	Waste in inert landfill	0.24	lb
Quaternary (DDAC)			
Inputs from technosphere: materials/fuels			
Natural gas, carbon source	Natural gas, processed, at plant NREL/US U	13.0	ft^3
Natural gas, plant boiler	Natural gas, combusted in industrial boiler NREL/US U	198	ft^3
DDAC component transportation, truck	Transport, combination truck, diesel powered NREL/US U	0.25	ton-mi
Inputs from technosphere: electricity/heat			
Electricity, in plant	Electricity, at grid, US NREL/US U	0.10	kWh
Monoethanolamine (MEA)			
Inputs from technosphere: materials/fuels			

Natural gas, carbon source	Natural gas, processed, at plant NREL/US U	16.0	ft^3
Natural gas, plant boiler	Natural gas, combusted in industrial boiler NREL/US U	4.4	ft^3
Diesel, plant equipment	Diesel, combusted in industrial boiler NREL/US U	7.9×10^{-6}	gal
Gasoline, plant equipment	Gasoline, combusted in equipment NREL/US U	8.7×10^{-6}	gal
MEA component transportation, truck	Transport, combination truck, diesel powered NREL/US U	0.0062	ton-mi
MEA component transportation, rail	Transport, train, diesel powered NREL/US U	0.0052	ton-mi
MEA component transportation, barge	Transport, barge, residual fuel oil powered NREL/US U	0.014	ton-mi
Inputs from technosphere: electricity/heat			
Electricity, in plant	Electricity, at grid, US NREL/US U	0.12	kWh
ACQ Manufacturing Plant			
Inputs from technosphere: materials/fuels			
Copper, feedstock	Copper (see above)	0.533	lb
DDAC, feedstock	DDAC (see above)	0.333	lb
MEA, feedstock	MEA (see above)	1.83	lb
Copper transportation, to ACQ plant, truck	Transport, combination truck, diesel powered NREL/US U	0.133	ton-mi
Inputs from technosphere: electricity/heat			
Electricity, blending and heating ACQ components	Electricity, at grid, US NREL/US U	9.9×10^{-4}	kWh

Table 5. LCI data for one lb of ACQ preservative production. Data is based on production of one lb each of copper, DDAC, and MEA.

2.2.1.4 ACQ-Treatment Process

The majority of the ACQ treatment process data is from a previous study (Bolin & Smith, 2011b), the U.S. LCI database (NREL, 2012), as well as custom inventory processes developed for this research. The ACQ loading was assumed to be 8.82 lbs of ACQ per 83.3 ft^3 (1,000 BF) of softwood lumber, and ACQ retention was 0.85 lb ACQ/ft^3 of wood. As previously noted, the wood was assumed to have a density of 36.5 lb/ft^3.

The LCI inputs are based on 83.3 ft^3 (1,000 BF) of ACQ-treated lumber; however, all inputs were converted to ensure accuracy based on the functional unit (320 ft^2 of decking surface for 25 years). The process water demand was 120 gal, and 11 lbs and 2.9 x 10^{-5} lbs of coal and uranium oxide fuel were required, respectively (it was assumed the energy content of the coal was 26.4 MJ/kg). The crude oil demand (0.304 lb) was based on medium-weight oil (35.6 degrees API) with a density of 847 kg/m^3 at 60°F (Engineering Toolbox, n.d.). The natural gas demand was 410 ft^3, and 5,300 British thermal units (Btu) and 400 Btu of hydropower energy and unspecified electricity were required, respectively. An additional 21 kWh of electricity was also required. Other inputs were also required to power the plant boilers and equipment; these are detailed in Table 6.

Transport of ACQ preservative components is also included in the inventory for this process. The transportation inventory data are from ACQ treater survey responses received by Bolin and Smith (2011b) and personal communications (Aro, 2016), and includes average transportation inputs for delivering lumber and ACQ preservative to the ACQ-treating plant, and shipping ACQ-treated lumber out of the plant. The transportation demands were 290 ton-miles (truck), 66 ton-miles (train), 0.74 ton-miles (barge), and 8.5 ton-miles (ocean freighter).

In addition, 2.6 x 10^{-4} lbs of copper are emitted to the soil during the ACQ-treatment process; this was modeled as an emission to soil.

The major LCI processes for the ACQ-treatment process are shown in Table 6.

Description	LCI Data Source	Quantity	Unit
Inputs from technosphere: materials/fuels			
Coal, fuel	Coal, 26.4 MJ per kg	11.0	lb
Coal, plant equipment	Bituminous coal, combusted in industrial boiler NREL/US U	0.0056	lb
Uranium oxide, fuel	Uranium oxide, 332 GJ per kg, in ore	2.9×10^{-5}	lb
Crude oil	Oil, crude	0.304	lb
Natural gas	Gas, natural/m3	410	ft^3
Natural gas, feedstock	Natural gas, processed, at plant NREL/US U	350	ft^3
Natural gas, plant boiler	Natural gas, combusted in industrial boiler NREL/US U	120	ft^3
Propane, plant equipment	Liquefied petroleum gas, combusted in industrial boiler NREL/US U	0.15	gal
Fuel oil, plant equipment	Residual fuel oil, combusted in industrial boiler NREL/US U	0.022	gal
Biomass, plant equipment	Proxy_Hogfuel-Biomass (50% MC), combusted in industrial boiler NREL/US U	0.55	lb
Diesel, plant equipment	Diesel, combusted in industrial boiler NREL/US U	3.80	gal
Gasoline, plant equipment	Gasoline, combusted in equipment NREL/US U	0.017	gal
ACQ component transportation, truck	Transport, combination truck, diesel powered NREL/US U	290	ton-mi
ACQ component transportation, rail	Transport, train, diesel powered NREL/US U	66.0	ton-mi
ACQ component transportation, barge	Transport, barge, residual fuel oil powered NREL/US U	0.74	ton-mi
ACQ component transportation, ocean freighter	Transport, ocean freighter, average fuel mix NREL/US U	8.50	ton-mi
Inputs from technosphere: electricity/heat			
Electricity, in plant	Electricity, at grid, US NREL/US U	2.0	kWh
Hydropower	Energy, from hydro power	5,300	Btu
Energy	Energy, unspecified	400	Btu
Inputs from nature			
Process water	Water, process, unspecified natural origin/m^3	120	gal
Emissions to soil			
Copper, emission to soil	Copper	2.6×10^{-4}	lb

Table 6. LCI data for 83.33 ft^3 (1,000 BF) of ACQ-treated wood.

2.2.1.5 Thermally-Modified Wood Decking Sealer

As previously noted, the thermally-modified wood deck sealer was modeled after Tikkurila Valtti Puuoljy wood oil (Tikkurila, 2017), utilizing compositional data provided in the product's Safety Data Sheet (SDS) and modeled using LCI inputs from the *DATASMART LCI* database (LTS, 2016). Naptha, ethylene glycol monoethyl ether, fatty acids from vegetarian oil, methyl ethyl ketone, and fungicides comprised 93%, 3%, 3%, 0.3%, and 0.5% of the sealer weight, respectively. The sealer components were shipped 500 miles to the manufacturing plant via truck, with one gallon of the sealer weighing 6.68 lbs.

The LCI inputs are based on one gallon of sealer production. To manufacture the sealer, 6.22 lbs of naptha is used as a feedstock. As noted in the SDS, 2-butoxyethanol is a required component; however, publicly-available process data for this material could not be found. Therefore, a proxy was developed. Butyl cellosolve, a solvent produced by The Dow Chemical Company®, is equivalent to 2-butoxyethanol and ethylene glycol monobutyl ether (Dow, 2001). While not an exact match, the LCI proxy was inputted as 0.2 lbs of ethylene glycol monoethyl ether. The SDS also states that the sealer contains "fatty acids, C6-19-branched, zinc salts." While process data for this specific material could not be found, 0.2 lbs of vegetable oil fatty acids was used as a close proxy. The next input, as noted in the SDS, is ethyl methyl ketoxime. However, publicly-available process data for this material also could not be found. It is known that this

material is the oxime derivative of methyl ethyl ketone; thus, 0.02 lbs of methyl ethyl ketone was used as a close proxy.

Biocides are also included in the sealer to prevent fungal growth on the decking surface. While the exact biocides used in the sealer product, as noted in the SDS, are 2-octyl-2H-isothiazol-3-one and 4,5-dichloro-2-octyl-2H-isothiazol-3-one, publicly-available inventory data for these are not available. Therefore, 0.03 lbs of generic fungicides was used as a close proxy.

Electricity is required to blend and heat the sealer components into the final product. According to a previously published report (Lippiatt, 2007), a commercially-available bio-based wood sealer coating manufactured by BioPreserve (Erie, PA) requires 0.0022 kWh/kg of electricity for final blending and heating. This electricity consumption value was used in the LCI, after being modified to account for differences in product density (7.50 lbs/gal for the bio-based wood sealer vs. 6.68 lbs/gal for the thermally-modified wood sealer). (The electricity demand was modified based on the assumption that less-dense materials require less electricity to blend than more-dense materials). The transportation demand for the sealer components was 1.65 ton-miles.

The major LCI processes for the thermally-modified wood decking sealer are shown in Table 7.

Description	LCI Data Source	Quantity	Unit
Inputs from technosphere: materials/fuels			
Naptha, feedstock	Naphtha, at regional storage/US- US-EI U	6.22	lb
Ethylene glycol, feedstock	Ethylene glycol monoethyl ether, at plant/US- US-EI U	0.20	lb
Fatty acids, feedstock	Fatty acids, from vegetarian oil, at plant/US- US-EI U	0.20	lb
Methyl ethyl ketone, feedstock	Methyl ethyl ketone, at plant/US- US-EI U	0.02	lb
Fungicides	Fungicides, at regional storehouse/US-US-EI U	0.034	lb
Sealer component transportation, truck	Transport, combination truck, diesel powered NREL/US U	1.65	ton-mi
Inputs from technosphere: electricity/heat			
Electricity, blending and heating	Electricity, at grid, US NREL/US U	5.94×10^{-3}	kWh

Table 7. LCI data for one gal of thermally-modified wood decking sealer.

2.2.1.6 ACQ Decking Sealer

As previously noted, the ACQ deck sealer was modeled after Penofin 250 VOC Pressure Treated Formula wood sealer (Penofin, 2017). Naptha, xylene, oleic acid, ethyl benzene, methyl ethyl ketone, magnetite, palm oil, and fungicide comprise 30%, 11%, 7%, 1%, 1%, 10%, 39%, and 1% of the sealer by weight, respectively. Sealer components were shipped 500 miles to the manufacturing plant via truck, and one gallon of the sealer weighs 8.68 lbs.

The LCI inputs are based on one gallon of sealer production. To manufacture the sealer, 2.60 lbs, 0.955 lbs, and 0.0868 lbs of naptha, xylene, and ethyl benzene are used as feedstocks. The sealer also contained up to 2% 2-butanone oxime; however, since publicly-available process data for this material was not available, a proxy was developed. It is known that greater than 95 wt. % of 2-butanone oxime is comprised of methyl ethyl ketoxime (TFS, 2009), which is

the oxime derivative of methyl ethyl ketone. Thus, it was reasonable to substitute methyl ethyl ketone (0.0868 lbs) for 2-butanone oxime in this study.

Oleic acid is also a product input; however, there was no publicly-available process data available for this material. Therefore, a custom oleic process was created for this study, based on a commercial plant operating 330 days per year (24 hrs/day). The LCI was based on production of 1 kg of oleic acid. In such a plant, 728.6 tons of glycerine and 3,637 tons of residual fatty acids are also produced as co-products (Sari & Atu, n.d.). Glycerine and fatty acids are commonly used in cosmetics, so this study assumes that they are used for cosmetic production (as opposed to disposal), reducing the need to produce "new" glycerine and fatty acids for cosmetics. Thus, in this study, glycerine and fatty acids are considered avoided products and are modeled as such in the LCA. Therefore, 0.243 kg and 1.21 kg of avoided product glycerine and fatty acids, respectively, are produced per kg of oleic acid.

Substantial amounts of water are also required to produce oleic acid. In particular, 1.50×10^7 gal, 383 gal, and 7.7×10^7 gal of process water, utility sanitation water, and boiler feed water are consumed per hour, respectively. Based on 7,920 total hours of annual plant operation, 0.379 tons of oleic acid can be produced per hour. For the purposes of this research, these three process

water types were aggregated, yielding 266,814 gallons of total process water per kg of oleic acid. In addition, 3.76×10^{7} gal of cooling water are required per hour (109,631 gal per kg of oleic acid).

Sari & Atu (n.d.) reported that 1.369 tons of phosphoric acid are also needed to produce 3,000 tons of oleic acid. The phosphoric acid demand was converted using the previously-described plant operational data, resulting in 4.56×10^{-4} kg of phosphoric acid required per kg of oleic acid. This inventory item was selected from the *Ecoinvent v. 3.3* unit process database (Wernet et al., 2016). Also, previous work (Mulvaney, 2013) showed that oleic acid can be manufactured from soybean, tallow, palm, or canola oil. Thus, in this study, the 3.131 kg bio-oil demand was modeled as vegetable oil.

Energy (electricity and heat) inputs for oleic acid production were not available in the literature or the LCI databases used in this study. However, a previous study (Mulvaney, 2013) reported that 0.036 kWh of electricity is required for trans-esterification of one kg of biosynthetic base oil. In this study, therefore, it was assumed that oleic acid electricity demands were similar to trans-esterification. Thus, 0.0198 kWh of electricity was required to produce each kg of oleic acid. Process heat is also required to produce oleic acid. Again, exact heat demands were not available in the literature or the LCI databases. Mulvaney (2013), however, reported that 0.241 kWh of thermal energy is required to produce one kg of biosynthetic base oil. This base oil is comprised of 55 wt. % oleic acid;

thus, the heat demand for the oleic acid was modified based on the oleic acid portion of the base oil, resulting in 0.133 kWh of required heat per kg of oleic acid.

Fungicides are also required to prevent biological growth in the sealer and the coated wood. The Penofin sealer contains up to 2% 3-iodo-2-propynylbutylcarbamate as a fungicide; however, publicly-available process data for this material could not be found. Therefore, 0.0868 lbs of generic fungicides were used as a close proxy. The sealer also contains up to 10% ferric oxide (Fe_2O_3) as a colorant. Since inventory data for this material was not available, magnetite (Fe_3O_4), which is a very similar iron oxide feedstock, was used as a proxy. The sealer was therefore modeled to contain 0.868 lbs of magnetite per gal of sealer. The Penofin sealer also contains up to 39% rosewood oil; however, 3.39 lbs of refined palm oil was used as a proxy.

Electricity is also required to heat and mix all of the sealer components into the finished product. The electricity demand was estimated based on the previously-noted research (Lippiatt, 2007). It was assumed that 0.0022 KWh of electricity is required per kg of sealer for final blending and heating. The electricity demand was also modified to account for the density differences between the bio-based wood sealer coating manufactured by BioPreserve (Erie, PA) (7.50 lbs/gal) and the Penofin sealer (8.68 lbs/gal). The final electricity demand was 0.01 kWh per gal of sealer.

It was also assumed that the average transportation distance of sealer components to the sealer-manufacturing plant was 500 miles via truck (Bolin & Smith, 2011b), resulting in a transportation demand of 2.10 ton-miles.

The major LCI processes for the ACQ decking sealer are shown in Table 8.

Description	LCI Data Source	Quantity	Unit
Oleic Acid			
Ouputs to technosphere			
Glycerine, avoided product	Glycerine, at plant NREL/RNA U	0.243	lb
Fatty acids, avoided product	Fatty acids, from vegetarian oil, at plant/US- US-EI U	1.21	kg
Inputs from technosphere: materials/fuels			
Phosphoric acid	Phosphoric acid, industrial grade, without water, in 85% solution state {GLO}| market for | Alloc Rec, U	4.56×10^{-4}	kg
Vegetable oil, feedstock	Vegetable oil, refined {GLO}| market for | Alloc Rec, U	3.131	kg
Inputs from technosphere: electricity/heat			
Electricity, blending and mixing	Electricity, at grid, US NREL/US U	0.0198	kWh
Process heat	Heat, unspecific, in chemical plant/US- US-EI U	0.133	kWh
Inputs from nature			
Process water	Water, process, unspecified natural origin/m3	2.67×10^{-5}	gal
Cooling water	Water, cooling, unspecified natural origin, US	0.50	ton-mi
ACQ Decking Sealer			
Inputs from technosphere: materials/fuels			
Naptha, feedstock	Naphtha, at regional storage/US- US-EI U	2.60	lb
Xylene, feedstock	Xylene, at plant/US- US-EI U	0.955	lb
Oleic acid, feedstock	Oleic acid (see above)	0.608	lb

Palm oil, feedstock	Palm oil, refined {GLO}| market for | Alloc Rec, U	3.39	lb
Ethyl benzene, feedstock	Ethyl benzene, at plant/US- US-EI U	0.0868	lb
Methyl ethyl ketone, feedstock	Methyl ethyl ketone, at plant/US- US-EI U	0.0868	lb
Magnetite	Magnetite, at plant/GLO US-EI U	0.868	lb
Fungicides	Fungicides, at regional storehouse/US- US-EI U	0.0868	lb
Sealer component transportation, truck	Transport, combination truck, diesel powered NREL/US U	2.10	ton-mi
Inputs from technosphere: electricity/heat			
Electricity, blending and mixing	Electricity, at grid, US NREL/US U	0.01	kWh

Table 8. LCI data for one gal of ACQ-treated wood decking sealer. (Data for oleic acid is based on one kg of product.)

2.2.1.7 Installation and Maintenance of Decks

The LCI for installing and maintaining both the ACQ-treated and thermally-modified wood decks was quite similar. It was assumed the decking surface was 20-ft x 16-ft (320 ft^2). As previously noted, the spacing of deck boards was one board for every six in of deck surface. Inventory for deck joists and related structural support materials was not included in this study. Each deck contained 1,047 steel, three-inch screws with each screw weighing 5.85 g, for a total of 6,125 g. For both decks, it was assumed that a hand power drill consuming 0.364 kW of power was used for 2 hours to drive the screws, requiring a total 0.728 kWh of electricity. (The average power consumption of the power drill was based on an article by Cockerham (2016).)

To calculate the amount of ACQ-treated decking need to manufacture the deck, it was determined that 1,000 board-feet weighed 3,424 lbs. Since the decking was

1.25-inch thick, the 320 ft^2 surface area of the deck was converted to volume (33.33 ft^3) and then to weight (1,370 lbs). Similar calculations revealed that the 320 ft^2 of thermally-modified wood decking weighed 1,271 lbs.

This study assumed that both the ACQ-treated wood and thermally-modified wood was transported 500 miles from the treating plants to the retailer via train, resulting in transportation demands of 343 ton-miles for the ACQ-treated wood and 318 ton-miles for the thermally-modified wood. Both sealer types were transported 300 miles round trip from the manufacturer to the retailer via diesel truck, resulting in transportation demands of 7.57 ton-miles and 3.93 ton-miles for the ACQ-treated wood sealer and thermally-modified wood sealer, respectively. It was also assumed that a diesel truck drove 20 miles round trip to deliver both types of decking to the installation sites, resulting in transportation demands of 13.7 ton-miles and 12.7 ton-miles for the ACQ-treated wood and thermally-modified wood, respectively. It was assumed the trucks contained no other items and returned empty to the retailer.

It was assumed that, for both decking materials, sealer was applied at the time of installation (Year 0 (Y0)) and at five-year intervals until 25 years had passed. Thus, sealer was applied five times (Y0, Y5, Y10, Y15, and Y20). For each sealer application, it was assumed that the homeowner drove 20 miles round trip in an automobile to purchase the sealer; no other items were purchased. The transportation burden of the screws was not included in this analysis due to the

negligible impact. Therefore, the total transportation for each deck's lifetime for the purchase and delivery of the sealer was 100 miles of automobile transport (20.35 average miles-per-gallon).

For the ACQ-treated deck, it was assumed that one gallon of the Penofin sealer covered 275 ft^2 of decking surface (as per the manufacturer's recommendation). Based on a product density of 8.68 lbs/gal, the 320 ft^2 deck required 1.163 gal (10.1 lbs) of sealer. Because the sealer was applied five times over the deck's life cycle (YO, Y5, Y10, Y15, and Y20), 50.5 lbs of Penofin was required over the lifetime of the ACQ-treated deck. For the thermally-modified wood deck, it was assumed that one liter of the Tikkurila Valtti Puuoljy wood oil sealer covered 108 ft^2 (or 408 ft^2/gal). Based on a product density of 6.68 lbs/gal, the 320 ft^2 deck required 0.784 gal (5.23 lbs) of sealer per application. The sealer was applied at the same maintenance intervals as the ACQ-treated wood deck; thus 26.2 lbs of the Tikkurila Valtti Puuoljy wood oil sealer was required over the lifetime of the thermally-modified wood deck.

This study also included the leaching of copper from the ACQ-treated deck over its lifetime. Previous research (Bolin & Smith, 2011b) revealed that the copper in ACQ-treated wood can be mobile, and an average of 0.12 lbs of copper leaches out of 1,000 BF of ACQ-treated wood decking per year. Since the deck in this study is 400 BF and is used for 25 years, the total amount of copper leached to the soil is 1.2 lbs over the deck's lifetime.

The major LCI processes for the installation and maintenance of both decking types are shown in Table 9.

Description	LCI Data Source	Quantity	Unit
ACQ-Treated Wood Deck			
Inputs from technosphere: materials/fuels			
Steel screws	Steel, low-alloyed {GLO}| market for | Alloc Def, U	6,125	g
Sealer	ACQ Decking Sealer	50.5	lb
Sealer transportation, manufacturer to retailer, truck	Transport, light commercial truck, diesel powered, East North Central/tkm/RNA	7.57	ton-mi
Sealer transportation, retailer to installation site, automobile	Transport, automobile, gasoline, 20.35 mpg, US fleet average 2009/US U	100	mi
ACQ-treated wood transportation, manufacturer to retailer, rail	Transport, train, diesel powered NREL/US U	343	ton-mi
ACQ-treated wood, transportation, retailer to installation site, truck	Transport, light commercial truck, diesel powered, East North Central/tkm/RNA	13.7	ton-mi
Inputs from technosphere: electricity/heat			
Electricity, driving screws	Electricity, at grid, US NREL/US U	0.728	kWh
Emissions to soil			
Copper leaching from deck, emission to soil	Copper	1.2	lb
Thermally-Modified Wood Deck			
Inputs from technosphere: materials/fuels			
Steel screws	Steel, low-alloyed {GLO}| market for | Alloc Def, U	6,125	g
Sealer	TMT Decking Sealer	26.2	lb
Sealer transportation, manufacturer to retailer, truck	Transport, light commercial truck, diesel powered, East North Central/tkm/RNA	3.93	ton-mi
Sealer transportation, retailer to installation site, automobile	Transport, automobile, gasoline, 20.35 mpg, US fleet average 2009/US U	100	mi
Thermally-modified wood transportation, manufacturer to retailer, rail	Transport, train, diesel powered NREL/US U	318	ton-mi
Thermally-modified wood, transportation, retailer to installation site, truck	Transport, light commercial truck, diesel powered, East North Central/tkm/RNA	12.7	ton-mi
Inputs from technosphere: electricity/heat			
Electricity, driving screws	Electricity, at grid, US NREL/US U	0.728	kWh

Table 9. LCI data for the installation and maintenance of 320 ft^2 of decking over 25 years.

2.2.1.8 Decking Disposal Scenarios

This study assessed three different decking disposal scenarios upon completion of the decks' 25-year service-lives:

1. ACQ-treated wood decking landfilling,
2. Thermally-modified wood decking landfilling, and
3. Thermally-modified wood decking incineration.

Incineration of ACQ-treated wood by residential parties is generally not allowed per environmental regulations (LSU, n.d.); if it is allowed, permits are typically required. Thus, it is recommended that homeowners bring their waste ACQ-treated wood to their local municipal landfill (DEEP, 2017). Therefore, in this study, it was assumed that the ACQ-treated wood was disposed of in a modern municipal solid waste (MSW) landfill. In the thermally-modified wood deck landfilling scenario, the material was also disposed of in a MSW landfill. In the thermally-modified wood deck incineration scenario, the material was incinerated in a municipal waste incineration plant. All disposal scenarios were custom modeled based on a waste treatment scenario described in the *DATASMART LCI* database (LTS, 2016). Details of each scenario are described below.

2.2.1.8.1 ACQ-Treated Wood Deck Landfilling Scenario

In this scenario, it was assumed that the decking material was transported 20 miles round trip via diesel truck from the deconstruction site to a municipal waste collection center. Based on the deck's total weight (1,370 lbs), the transportation demand was 13.7 ton-miles. The decking material was then transported 20 miles

round trip via a diesel refuse (“garbage”) truck from the collection center to the MSW landfill. This transportation demand was also 13.7 ton-miles.

The disposal scenario included inputs and outputs for landfill construction, operation, closure, post-closure, landfill gas emissions, and leachate emissions. It represents average U.S. conditions for modern landfills that have controls for leachate and gas emissions (impermeable liners and caps, leachate and gas collection systems). The ACQ-treated deck was assumed to be 12% moisture content at the time of disposal. The entire deck (not including the steel screws) weighed 1,370 lbs and contained 3.0 lbs of retained ACQ preservative at an 85% preservative retention.

While the carbon content of wood varies across species, one study reported that the carbon content of 21 different North American softwood species ranges from 47.2% to 55.2% (Lamlom & Savidge, 2003); therefore, for the purposes of this study, the carbon content of the softwood decking was assumed to be 50%. The dry matter wood weight in the deck was 1,206 lbs, and the carbon content was 603 lbs. Using a 2% methane (CH_4) yield from landfilled wood carbon due to decomposition (EPA, 2015), the total amount of CH_4 produced from the landfilled wood was 10.1 lbs. In other words, each lb of landfilled wood produced 8.3×10^{-3} lb CH_4. This study modeled this CH_4 as an avoided product as it was assumed to replace an equal amount of CH_4 produced from traditional sources (i.e., for every lb of landfilled wood, 8.3×10^{-3} fewer lbs of CH_4 was needed from other

sources). The CH_4 was modeled as "*Natural gas, from high pressure network (1-5 bar), at service station/US* US-EI U*" (LTS, 2016) because it was assumed that it was sent to service station use. This disposal scenario also included electricity requirements of the service station as well as emissions from losses. Other landfill gases are assumed to be collected for 2 to 100 years with a 65% collection efficiency. The collected landfill gas is either flared or combusted in an internal combustion engine for electricity production.

The decomposition of the ACQ preservative components in the landfill was also modeled in this study. The CH_4 released from the DDAC component of the preservative was considered fossil methane as DDAC is petroleum-derived. Previous research revealed that 1.1 lbs of carbon in DDAC remains for every 1,000 BF of ACQ-treated wood disposed of in a landfill, and that 77% of the carbon is sequestered (Bolin & Smith, 2009). Again, it was assumed that 2% of this carbon is converted to CH_4 (EPA, 2015). (This assumes that the landfilling of carbon in the DDAC is converted to CH_4 at the same rate as in wood; studying the precise chemistry of these decomposition reactions is beyond the scope of this study.) Since the volume of the landfilled decking was 400 BF, it was determined that 0.44 lbs of carbon remained in the DDAC in the landfilled decking; 2% of this carbon was converted to fossil CH_4, resulting in 1.48×10^{-6} lbs of CH_4 released per lb of landfilled decking.

The amount of CO_2 released from the disposed of DDAC was also modeled; similar to the CH_4 emissions, these CO_2 emissions were also assumed to be fossil-based as the DDAC was petroleum-derived. As previously noted, 77% of the carbon in the wood was sequestered and 2% was converted to CH_4; thus, 21% of the carbon in the DDAC remains and was converted to fossil CO_2. It is known that 0.44 lbs of carbon remained in the landfilled decking; 21% of this carbon was converted to fossil CO_2, resulting in 1.55×10^{-5} lbs of CO_2 released per lb of landfilled decking.

The MEA component of the landfilled ACQ preservative also released fossil CH_4. It was reported that 0.64 lbs of carbon in the MEA remained for every 1,000 BF of ACQ-treated wood disposed of in the landfill (Bolin & Smith, 2009). Assuming again that 77% of this carbon was sequestered and 2% was converted to CH_4, it was determined that 8.60×10^{-7} lbs of CH_4 was released per lb of landfilled decking. The amount of CO_2 released from the disposed of MEA component of the ACQ preservative was also included in the study. Again, assuming that 0.64 lbs of carbon in the MEA remained for every 1,000 BF of landfilled ACQ-treated wood, it was determined that 9.03×10^{-6} lbs of CO_2 was released per lb of landfilled decking.

Finally, the copper leached from the landfilled ACQ-treated wood decking was also modeled. Bolin and Smith (2011b) reported that 4 lbs of copper is emitted for every 1,000 board-feet of ACQ-treated decking disposed of in a landfill. Since

400 BF (1,370 lbs) of decking was landfilled, 1.17 x 10^{-3} lbs of copper was released to the soil per lb of landfilled decking.

2.2.1.8.2 Thermally-Modified Wood Deck Landfilling Scenario

In this scenario, it was assumed that the decking material was transported 20 miles round trip via diesel truck from the deconstruction site to the municipal waste collection center, resulting in a transportation demand of 12.7 ton-miles. A larger refuse ("garbage") truck was then used to transport the decking material from the collection center to the MSW landfill, resulting in another transportation demand of 12.7 ton-miles.

This landfill scenario includes inputs and outputs for landfill construction, operation, closure, post-closure, landfill gas emissions, and leachate emissions. It represents average U.S. conditions for modern landfills that have controls for leachate and gas emissions (e.g., impermeable liners and caps, leachate and gas collection systems, etc.). The thermally-modified wood deck was assumed to be 8% moisture at the time of disposal. The entire deck (not including the steel screws) weighed 1,271 lbs, with 1,169 lbs of dry matter. Recent research shows that thermally-modified softwoods may have slightly higher carbon content than non-modified wood (Boonstra & Tjeerdsma, 2006), with thermally-modified Radiata pine having a 50.6% carbon content, compared to 49.6% for non-

modified pine. Thus, in this study, the carbon content of the thermally-modified softwood was assumed to be 50.6%, for a total of 592 lbs of carbon in the landfilled deck.

Using the same methodology as the ACQ-treated wood decking disposal scenario, above, it was assumed that the CH_4 yield of the thermally-modified wood was 2% of landfilled wood carbon (EPA, 2015). Thus, the total amount of CH_4 generated was 11.8 lbs for the entire deck, or 9.3×10^{-3} lbs per lb of landfilled wood. This CH_4 was modeled as an avoided product as it was assumed to replace an equal amount of CH_4 produced from traditional sources (i.e., for every lb of landfilled wood, 9.3×10^{-3} fewer lbs of CH_4 was needed from other sources). This CH_4 was modeled as "*Natural gas, from high pressure network (1-5 bar), at service station/US* US-EI U*" (LTS, 2016) because it was assumed that it was sent to service station use. This disposal scenario also included electricity requirements of the service station as well as emissions from losses. Other landfill gases are assumed to be collected for 2 to 100 years with a 65% collection efficiency. The collected landfill gas is either flared or combusted in an internal combustion engine for electricity production.

2.2.1.8.3 Thermally-Modified Wood Deck Incineration Scenario

In the second thermally-modified wood deck disposal scenario, the deck was assumed to be incinerated in a municipal waste incineration plant. The steel screws were assumed to have 0% moisture and were also incinerated in the

plant at the same time as the decking material. Similar to the other disposal scenarios, the decking material was transported 20 miles round trip via diesel truck from the deconstruction site to the municipal waste collection center, resulting in a transportation demand of 12.7 ton-miles. The decking material was then transported 20 miles round trip via a larger ("garbage") truck to the incineration plant, resulting in an additional transportation demand of 12.7 ton-miles.

This disposal scenario includes burdens associated with construction and disposal of the incineration plant, and is based on 100,000 tons-per-year capacity for an operational life of 40 years. It includes waste-specific air and water emissions from the incineration, materials for flue gas cleaning, short-term emissions to river water and long-term emissions to ground water from the bottom slag and landfilling of waste fly ashes and scrubber sludge. The net energy produced by the plant was assumed to be 1.3 MJ/kg electricity and 2.7 MJ/kg thermal energy.

The major LCI processes for the three disposal scenarios are shown in Table 10.

Description	LCI Data Source	Quantity	Unit
ACQ-Treated Wood Decking Landfill			
Inputs from technosphere: materials/fuels			
MSW landfill, facility	Municipal solid waste landfill, facility/US US-EI/I U	0.454	lb
MSW landfill, operation	Municipal solid waste landfill, operation/US US-EI U	0.454	lb
MSW landfill, closure	Municipal solid waste landfill, closure/US US-EI U	0.454	lb
MSW landfill, post-closure	Municipal solid waste landfill, post-closure/US US-EI U	13.6	lb
Decking waste transport, to collection site	Transport, light commercial truck, diesel powered, East North Central/tkm/RNA	0.01	ton-mi
Decking waste transport, to MSW landfill	Transport, refuse truck, diesel powered, East North Central/tkm/RNA	0.01	ton-mi
Emissions to air			
Landfill gas emissions	Landfill gas emissions, wood, 2-100 yrs/US US-EI U	0.454	lb
Landfill gas emissions	Landfill gas emissions, wood, 0-2 yrs/US US-EI U	0.454	lb
Landfill gas emissions	Landfill gas emissions, wood, 100-500 yrs/US US-EI U	0.454	lb
Methane, from DDAC decomposition	Methane, fossil	1.48×10^{-6}	lb
Methane, from MEA decomposition	Methane, fossil	8.6×10^{-7}	lb
Methane, from DDAC decomposition	Carbon dioxide, fossil	1.55×10^{-5}	lb
Methane, from MEA decomposition	Carbon dioxide, fossil	9.03×10^{-6}	lb
Emissions to soil			
Landfill leachate emissions	Leachate emissions, municipal solid waste landfill/US US-EI S	0.454	lb
Copper, from ACQ	Copper	1.17×10^{-3}	lb
Outputs to technosphere			
Methane, avoided product	Natural gas, from high pressure network (1-5 bar), at service station/US* US-EI U	8.34×10^{-3}	lb
Thermally-Modified Wood Decking Landfill			
Inputs from technosphere: materials/fuels			
MSW landfill, facility	Municipal solid waste landfill, facility/US US-EI/I U	0.454	lb
MSW landfill, operation	Municipal solid waste landfill, operation/US US-EI U	0.454	lb
MSW landfill, closure	Municipal solid waste landfill, closure/US US-EI U	0.454	lb

MSW landfill, post-closure	Municipal solid waste landfill, post-closure/US US-EI U	13.6	lb
Decking waste transport, to collection site	Transport, light commercial truck, diesel powered, East North Central/tkm/RNA	0.01	ton-mi
Decking waste transport, to MSW landfill	Transport, refuse truck, diesel powered, East North Central/tkm/RNA	0.01	ton-mi
Emissions to air			
Landfill gas emissions	Landfill gas emissions, wood, 2-100 yrs/US US-EI U	0.454	lb
Landfill gas emissions	Landfill gas emissions, wood, 0-2 yrs/US US-EI U	0.454	lb
Landfill gas emissions	Landfill gas emissions, wood, 100-500 yrs/US US-EI U	0.454	lb
Emissions to soil			
Landfill leachate emissions	Leachate emissions, municipal solid waste landfill/US US-EI S	0.454	lb
Outputs to technosphere			
Methane, avoided product	Natural gas, from high pressure network (1-5 bar), at service station/US* US-EI U	9.32×10^{-3}	lb

Thermally-Modified Wood Decking Incineration			
Inputs from technosphere: materials/fuels			
Sodium hydroxide	Sodium hydroxide, 50% in H2O, production mix, at plant/US- US-EI U	2.12×10^{-4}	lb
Quicklime	Quicklime, milled, packed, at plant/US* US-EI U	3.29 x 10-5	lb
Hydrochloric acid	Hydrochloric acid, 30% in H2O, at plant/US- US-EI U	7.77×10^{-7}	lb
Iron chloride	Iron (III) chloride, 40% in H2O, at plant/US* US-EI U	2.16×10^{-6}	lb
Organic chemicals	Chemicals organic, at plant/GLO US-EI U	8.56×10^{-7}	lb
Inorganic chemicals	Chemicals inorganic, at plant/GLO US-EI U	1.30×10^{-6}	lb
Cement	Cement, unspecified, at plant/US* US-EI U	3.85×10^{-4}	lb
Ammonia	Ammonia, liquid, at regional storehouse/US* US-EI U	2.82×10^{-5}	lb
Natural gas	Natural gas, burned in industrial furnace low-NOx >100kW/US- US-EI U	2.76×10^{-3}	MJ
Titanium dioxide	Titanium dioxide, production mix, at plant/US- US-EI U	8.11×10^{-7}	lb
Chromium oxide	Chromium oxide, flakes, at plant/US- US-EI U	1.65×10^{-8}	lb
Decking waste transport, to collection site	Transport, light commercial truck, diesel powered, East North Central/tkm/RNA	0.01	ton-mi
Decking waste transport, to incineration plant	Transport, refuse truck, diesel powered, East North Central/tkm/RNA	0.01	ton-mi
Transport, rail	Transport, freight, rail/US- US-EI U	3.71×10^{-4}	ton-mi

Transport, truck	Transport, lorry 20-28t, fleet average/US* US-EI U	1.33×10^{-4}	ton-mi
Inputs from technosphere: electricity/heat			
Incineration plant	Municipal waste incineration plant/US*/I US-EI U	1.42×10^{-10}	piece (p)
Landfill, slag	Slag compartment/US*/I US-EI U	4.16×10^{-12}	p
Landfill, inorganic polluted wastes	Residual material landfill facility/US*/I US-EI U	2.01×10^{-12}	p
Emissions to air			
Carbon monoxide, biogenic	Carbon monoxide, biogenic	1.26×10^{-4}	lb
Carbon dioxide, biogenic	Carbon dioxide, biogenic	0.828	lb
Methane, biogenic	Methane, biogenic	3.62×10^{-6}	lb
Sulfur dioxide	Sulfur dioxide	3.03×10^{-7}	lb
Nitrogen oxides	Nitrogen oxides	1.78×10^{-5}	lb
Ammonia	Ammonia	4.43×10^{-7}	lb
Dinitrogen monoxide	Dinitrogen monoxide	2.36×10^{-6}	lb
Cyanide	Cyanide	5.03×10^{-7}	lb
Phosphorus	Phosphorus	6.18×10^{-8}	lb
Boron	Boron	1.43×10^{-7}	lb
Hydrogen chloride	Hydrogen chloride	2.08×10^{-9}	lb
Hydrogen fluoride	Hydrogen fluoride	6.29×10^{-9}	lb
Arsenic	Arsenic	2.44×10^{-15}	lb
Cadmium	Cadmium	6.24×10^{-12}	lb
Cobalt	Cobalt	1.56×10^{-15}	lb
Chromium	Chromium	2.76×10^{-14}	lb
Copper	Copper	1.73×10^{-11}	lb
Mercury	Mercury	6.24×10^{-15}	lb
Manganese	Manganese	1.64×10^{-13}	lb
Molybdenum	Molybdenum	9.41×10^{-10}	lb
Nickel	Nickel	1.36×10^{-14}	lb
Lead	Lead	5.84×10^{-10}	lb
Zinc	Zinc	1.65×10^{-10}	lb
Iron	Iron	2.93×10^{-10}	lb
Calcium	Calcium	1.24×10^{-7}	lb
Aluminum	Aluminum	5.6×10^{-9}	lb
Potassium	Potassium	1.12×10^{-7}	lb
Magnesium	Magnesium	1.54×10^{-7}	lb
Sodium	Sodium	7.48×10^{-8}	lb
Waste heat	Heat, waste	6.92	MJ
Emissions to water			
Biological oxygen demand	BOD5, Biological Oxygen Demand	8.56×10^{-6}	lb
Chemical oxygen demand	COD, Chemical Oxygen Demand	1.52×10^{-5}	lb
Organic carbon	TOC, Total Organic Carbon	6.24×10^{-6}	lb
Dissolved organic carbon	DOC, Dissolved Organic Carbon	6.24×10^{-6}	lb
Sulfate	Sulfate	3.45×10^{-5}	lb
Nitrate	Nitrate	7.14×10^{-6}	lb
Phosphate	Phosphate	1.21×10^{-8}	lb
Boron	Boron	1.87×10^{-7}	lb
Chloride	Chloride	1.83×10^{-4}	lb
Fluoride	Fluoride	9.18×10^{-7}	lb

Arsenic	Arsenic	1.08×10^{-7}	lb
Cadmium	Cadmium	5.15×10^{-11}	lb
Cobalt	Cobalt	8.39×10^{-12}	lb
Chromium VI	Chromium VI	1.21×10^{-8}	lb
Copper	Copper	9.52×10^{-11}	lb
Mercury	Mercury	1.94×10^{-9}	lb
Manganese	Manganese	1.68×10^{-9}	lb
Molybdenum	Molybdenum	8.05×10^{-8}	lb
Nickel	Nickel	1.98×10^{-10}	lb
Lead	Lead	4.4×10^{-10}	lb
Zinc	Zinc	1.85×10^{-9}	lb
Iron	Iron	3.00×10^{-9}	lb
Calcium	Calcium	2.81×10^{-7}	lb
Aluminum	Aluminum	2.99×10^{-10}	lb
Potassium	Potassium	6.41×10^{-6}	lb
Magnesium	Magnesium	3.92×10^{-7}	lb
Sodium	Sodium	1.72×10^{-6}	lb
Chromium	Chromium	1.19×10^{-9}	lb
Biological oxygen demand, long-term, groundwater	BOD5, Biological Oxygen Demand	1.84×10^{-3}	lb
Chemical oxygen demand, long-term, groundwater	COD, Chemical Oxygen Demand	5.62×10^{-3}	lb
Organic carbon, long-term, groundwater	TOC, Total Organic Carbon	2.22×10^{-3}	lb
Dissolved organic carbon, long-term, groundwater	DOC, Dissolved Organic Carbon	2.22×10^{-3}	lb
Sulfate, long-term, groundwater	Sulfate	1.79×10^{-4}	lb
Nitrate, long-term, groundwater	Nitrate	2.01×10^{-5}	lb
Phosphate, long-term, groundwater	Phosphate	7.26×10^{-6}	lb
Boron, long-term, groundwater	Boron	7.88×10^{-7}	lb
Chloride, long-term, groundwater	Chloride	4.43×10^{-6}	lb
Fluoride, long-term, groundwater	Fluoride	1.07×10^{-5}	lb
Arsenic, long-term, groundwater	Arsenic	1.32×10^{-7}	lb
Cadmium, long-term, groundwater	Cadmium	1.14×10^{-9}	lb
Cobalt, long-term, groundwater	Cobalt	4.31×10^{-8}	lb
Chromium VI, long-term, groundwater	Chromium VI	3.95×10^{-8}	lb
Copper, long-term, groundwater	Copper	1.96×10^{-6}	lb
Mercury, long-term, groundwater	Mercury	9.41×10^{-9}	lb
Manganese, long-term,	Manganese	2.59×10^{-5}	lb

groundwater			
Molybdenum, long-term, groundwater	Molybdenum	3.89×10^{-7}	lb
Nickel, long-term, groundwater	Nickel	2.95×10^{-7}	lb
Lead, long-term, groundwater	Lead	1.13×10^{-6}	lb
Zinc, long-term, groundwater	Zinc	1.56×10^{-7}	lb
Iron, long-term, groundwater	Iron	4.11×10^{-6}	lb
Calcium, long-term, groundwater	Calcium	6.46×10^{-5}	lb
Aluminum, long-term, groundwater	Aluminum	2.66×10^{-6}	lb
Potassium, long-term, groundwater	Potassium	3.06×10^{-5}	lb
Magnesium, long-term, groundwater	Magnesium	1.03×10^{-4}	lb
Sodium, long-term, groundwater	Sodium	6.18×10^{-6}	lb
Waste, heat, to river	Heat, waste	1.34	MJ
Outputs to technosphere: waste/emissions to treatment			
Incineration plant, burdens[1]	Process-specific burdens, municipal waste incineration/US* US-EI U	0.567	lb
Landfill, slag, burdens[2]	Process-specific burdens, slag compartment/US* US-EI U	2.34×10^{-3}	lb
Landfill, inorganic polluted wastes, burdens[2]	Process-specific burdens, residual material landfill/US* US-EI U	9.64×10^{-4}	lb
Cement, disposal	Disposal, cement, hydrated, 0% water, to residual material landfill/US* US-EI U	9.64×10^{-4}	lb

Table 10. LCI data for disposal or incineration of one lb of decking waste. [1]Includes incineration burdens not attributed to specific waste components, but that are dependent on operating conditions, such as temperature and oxygen concentrations. [2]Includes process-specific (i.e., independent of waste composition) energy demand and land use of landfill.

2.2.1.9 Electricity Mixes

For activities occurring within the U.S., the electricity usage was modeled using the 2015 average U.S. electricity grid process from the *DATASMART LCI* database (LTS, 2016). These values were taken from the 2015 U.S. Energy Information Administration *Total Energy Report* (EIA, 2015). The electricity grid

mix is a mix of domestic production from various sources. The average grid mix for the electricity datasets used in this study is provided in Table 11.

Electricity Source	U.S.
Hard coal power plant	33.18%
Nuclear power plant	19.5%
Natural gas power plant	32.66%
Hydropower plant	6.14%
Oil power plant	0.70%
Lignite power plant	0.16%
Industrial gas power plant	0.16%
Cogeneration	0.104%
Solar PV	0.65%
Renewables (wind, solar, geothermal)	5.73%
Imports from Canada and Mexico	0.32%

Table 11. Average electricity grid mix for the U.S. (Approximately 0.7% waste-to-energy is not modeled do to the use of the cut-off method.)

Chapter 3. RESULTS

3.1 Life-Cycle Impact Assessment

The following sections present the characterized results of the LCA. As previously described, the impact assessment methods used for this study were the LTS Method, which combines the ReCiPe Endpoint (H) *v. 1.13* method with two endpoint categories (human health and resources) with the cumulative energy demand (CED), climate change, and water use midpoint impact categories. The ReCiPe Midpoint (H) v. *1.00* method was also used to calculate additional midpoint impacts. To aggregate emissions substances into the impact categories, substances were multiplied by their CF to convert into an equivalent substance (e.g., CO_2) and then added together to create a total for each impact category (e.g., climate change).

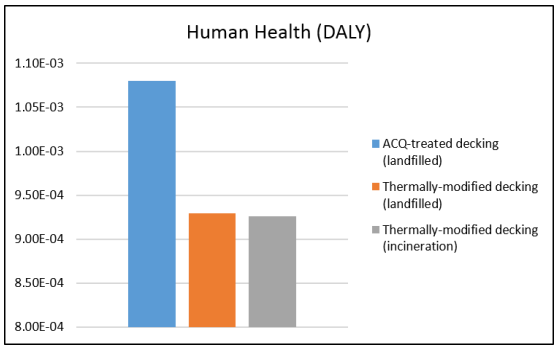
3.1.1 Comparative Analysis

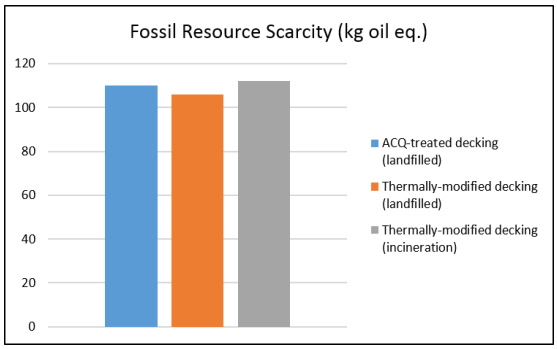
3.1.1.1 Product Life Cycles

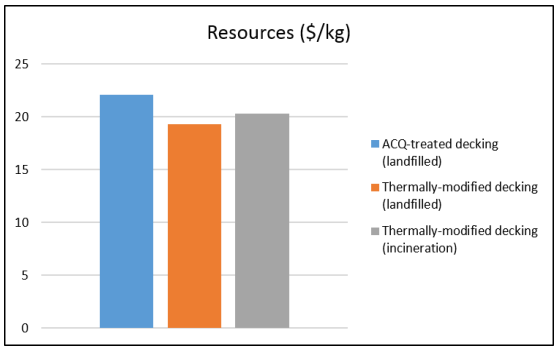
The primary objective of this study was to compare and quantify the life-cycle environmental impacts of 320 ft^2 of ACQ-treated softwood decking and thermally-modified softwood decking over a period of 25 years. Results of the comparative analysis of the decking products' life cycles are presented in Table 12 and Figures 11-25.

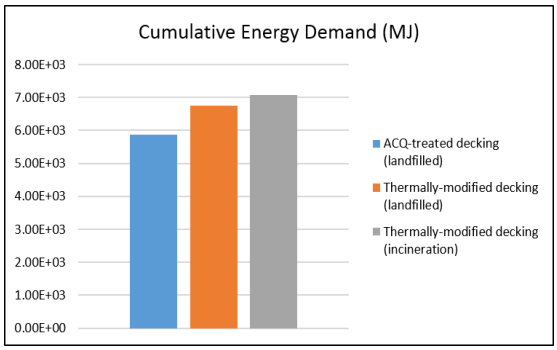
Impact Category	Unit	ACQ-treated decking (landfilled)	Thermally-modified decking (landfilled) (% difference compared to ACQ-treated)	Thermally-modified decking (incinerated) (% difference compared to ACQ-treated)
Human Health	DALY	1.08×10^{-3}	9.29×10^{-4} (-14.0%)	9.26×10^{-4} (-14.3%)
Resources	$/kg	22.1	19.3 (-12.7%)	20.3 (-8.10%)
Cumulative Energy Demand	MJ	5.88×10^{3}	6.76×10^{3} (15.0%)	7.07×10^{3} (20.2%)
Climate Change	kg CO_2 eq.	382	358 (-6.30%)	337 (-11.8%)
Water Use	m^3	3.79×10^{3}	6.72×10^{3} (77.3%)	6.92×10^{3} (82.6%)
Stratospheric Ozone Depletion	kg CFC11 eq.	2.3×10^{-4}	1.36×10^{-4} (-40.9%)	1.51×10^{-4} (-34.3%)
Ionizing Radiation	kBq Co-60 eq.	6.97	19 (273%)	20.1 (288%)
Fine Particulate Matter Formation	kg PM2.5 eq.	0.313	0.295 (-5.80%)	0.300 (-4.20%)
Terrestrial Acidification	kg SO_2 eq.	1.62	1.52 (-6.20%)	1.58 (-2.50%)
Terrestrial Ecotoxicity	kg 1,4-DCB eq.	124	0.0747 (-99.9%)	0.0736 (-99.9%)
Freshwater Ecotoxicity	kg 1,4-DCB eq.	30.8	9.29 (-69.8%)	17 (-44.8%)
Marine Ecotoxicity	kg 1,4-DCB eq.	38.6	12.4 (-67.9%)	21.3 (-44.8%)
Human Carcinogenic Toxicity	kg 1,4-DCB eq.	136	135 (-0.70%)	136 (0%)
Mineral Resource Scarcity	kg Cu eq.	1.8	0.747 (-58.5%)	0.668 (-62.9%)
Fossil Resource Scarcity	kg oil eq.	110	106 (-3.60%)	112 (1.82%)

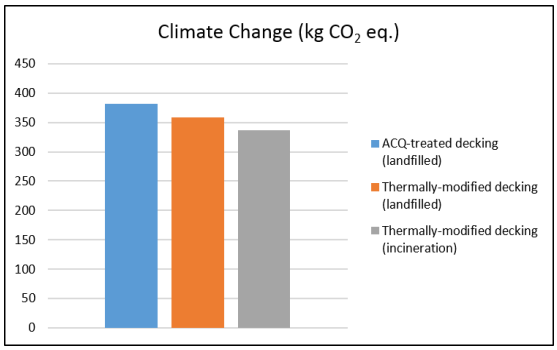
Table 12. Comparison of the life-cycle impacts of 320 ft^2 of decking over a 25-year period, using the LTS and ReCiPe Midpoint (H) *v. 1.00* methods.

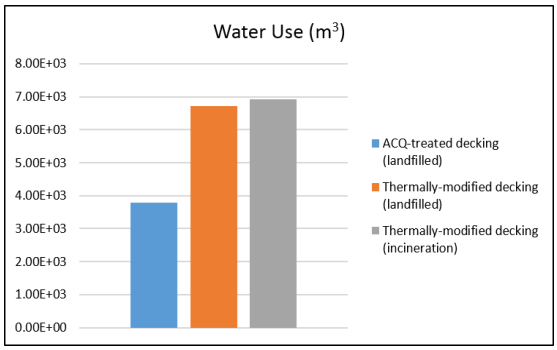

Human Health (DALY)
1.10E-03
1.05E-03
1.00E-03
9.50E-04
9.00E-04
8.50E-04
8.00E-04
ACQ-treated decking (landfilled)
Thermally-modified decking (landfilled)
Thermally-modified decking (incineration)

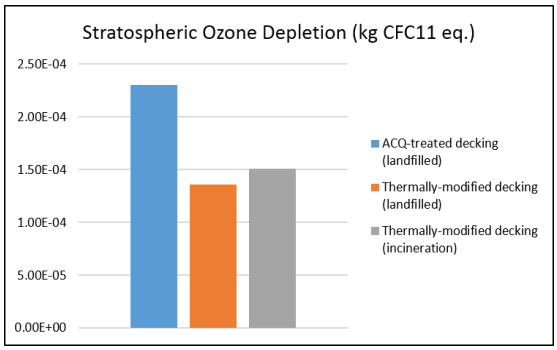

Fossil Resource Scarcity (kg oil eq.)
120
100
80
60
40
20
0
ACQ-treated decking (landfilled)
Thermally-modified decking (landfilled)
Thermally-modified decking (incineration)

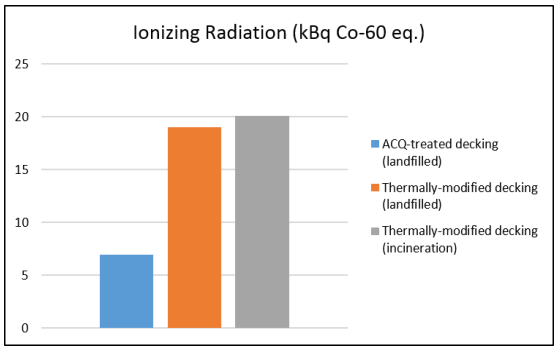

Resources ($/kg)
25
20
15
10
5
0
ACQ-treated decking (landfilled)
Thermally-modified decking (landfilled)
Thermally-modified decking (incincineration)

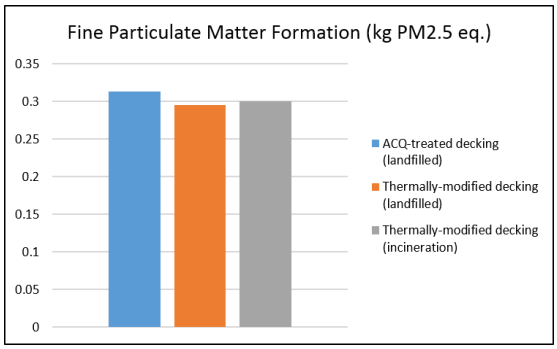

Cumulative Energy Demand (MJ)
8.00E+03
7.00E+03
6.00E+03
5.00E+03
4.00E+03
3.00E+03
2.00E+03
1.00E+03
0.00E+00
ACQ-treated decking (landfilled)
Thermally-modified decking (landfilled)
Thermally-modified decking (incineration)

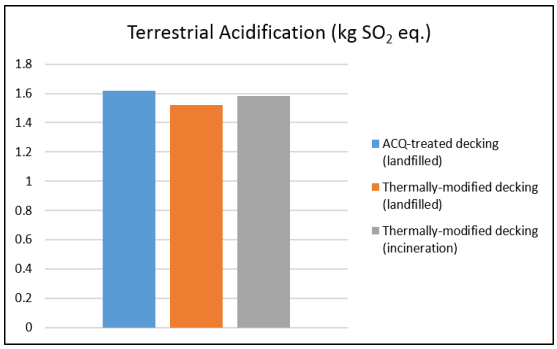

Climate Change (kg CO2 eq.)
450
400
350
300
250
200
150
100
50
0
ACQ-treated decking (landfilled)
Thermally-modified decking (landfilled)
Thermally-modified decking (incineration)

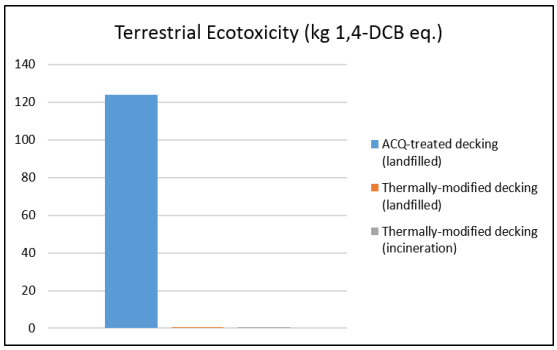

Water Use (m3)
8.00E+03
7.00E+03
6.00E+03
5.00E+03
4.00E+03
3.00E+03
2.00E+03
1.00E+03
0.00E+00
ACQ-treated decking (landfilled)
Thermally-modified decking (landfilled)
Thermally-modified decking (incineration)

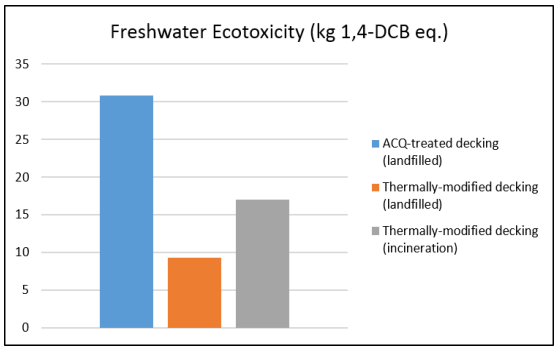

Stratospheric Ozone Depletion (kg CFC11 eq.)
2.50E-04
2.00E-04
1.50E-04
1.00E-04
5.00E-05
0.00E+00
ACQ-treated decking (landfilled)
Thermally-modified decking (landfilled)
Thermally-modified decking (incineration)

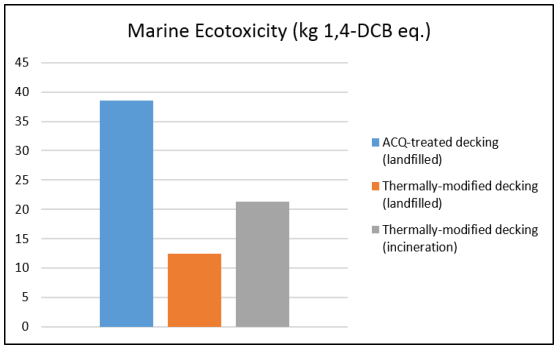

Ionizing Radiation (kBq Co-60 eq.)
25
20
15
10
5
0
ACQ-treated decking (landfilled)
Thermally-modified decking (landfilled)
Thermally-modified decking (incineration)

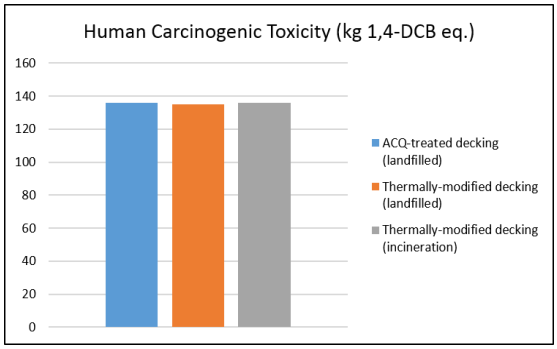

Fine Particulate Matter Formation (kg PM2.5 eq.)
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
ACQ-treated decking (landfilled)
Thermally-modified decking (landfilled)
Thermally-modified decking (incineration)

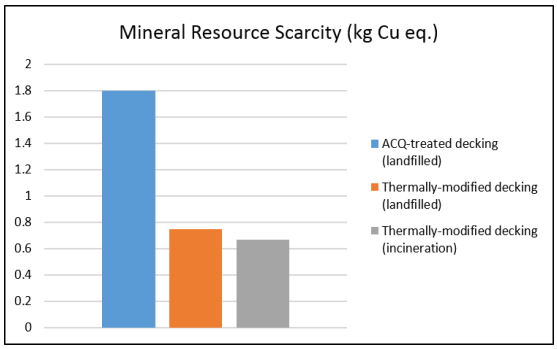

Terrestrial Acidification (kg SO_2 eq.)
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
ACQ-treated decking (landfilled)
Thermally-modified decking (landfilled)
Thermally-modified decking (incineration)


Terrestrial Ecotoxicity (kg 1,4-DCB eq.)
140
120
100
80
60
40
20
0
ACQ-treated decking (landfilled)
Thermally-modified decking (landfilled)
Thermally-modified decking (incineration)


Freshwater Ecotoxicity (kg 1,4-DCB eq.)
35
30
25
20
15
10
5
0
ACQ-treated decking (landfilled)
Thermally-modified decking (landfilled)
Thermally-modified decking (incineration)


Marine Ecotoxicity (kg 1,4-DCB eq.)
45
40
35
30
25
20
15
10
5
0
ACQ-treated decking (landfilled)
Thermally-modified decking (landfilled)
Thermally-modified decking (incineration)


Human Carcinogenic Toxicity (kg 1,4-DCB eq.)
160
140
120
100
80
60
40
20
0
ACQ-treated decking (landfilled)
Thermally-modified decking (landfilled)
Thermally-modified decking (incineration)



Figures 11-25. Comparison of the life-cycle impacts of 320 ft^2 of decking over a 25-year period, using the LTS and ReCiPe Midpoint (H) *v. 1.00* methods.

Figure 26 presents a comparative analysis utilizing the LTS method, collated into selected midpoint and endpoint impacts. Since the impacts of the landfilled and incinerated thermally-modified wood decking were very similar in most impact categories, the impacts of these two products were averaged together for presentation in Figure 26.

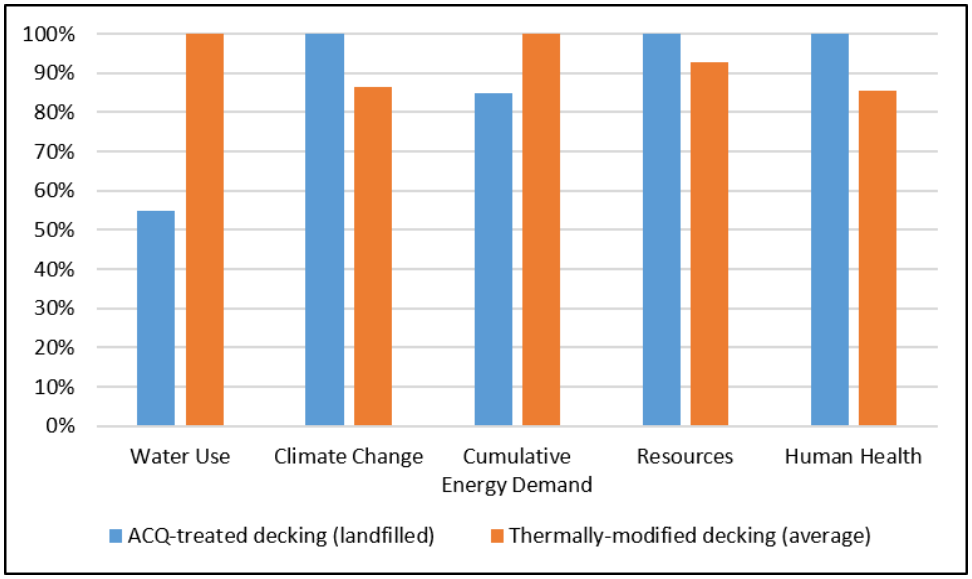


Figure 26. Comparison of the life-cycle impacts of 320 ft^2 of decking over a 25-year period, using the LTS method.

As shown in Figure 26, at end-of-life the thermally-modified wood decking had an average of 14%, 7.0%, and 13% lower human health, resources, and climate change impacts than the ACQ-treated wood decking. The ACQ-treated wood decking also had 45% lower water use impacts than the thermally-modified wood decking. The relatively large water use impacts for the thermally-modified wood decking is due largely to electricity demand (produced via hydropower) for the thermal-modification process. The ACQ-treated wood decking climate change impacts are due largely to the manufacture of the DDAC component of the ACQ preservative, accounting for 69% of the total climate change impacts; in comparison, the DDAC accounts for 57% of the total cumulative energy demand impacts. It appears that the climate change and cumulative energy demand impact results are counteritutive, since it would typically be expected for the ACQ-treated wood decking to have higher impacts in both categories. While it is difficult to determine the exact reason for these seemingly counteritutive results, they may be due to the relatively large amount of natural gas feedstock required to manufacture the DDAC and MEA components of the ACQ preservative.

Figure 27 presents a comparative analysis utilizing the ReCiPe Midpoint (H) *v. 1.00* method, collated into midpoint impacts.

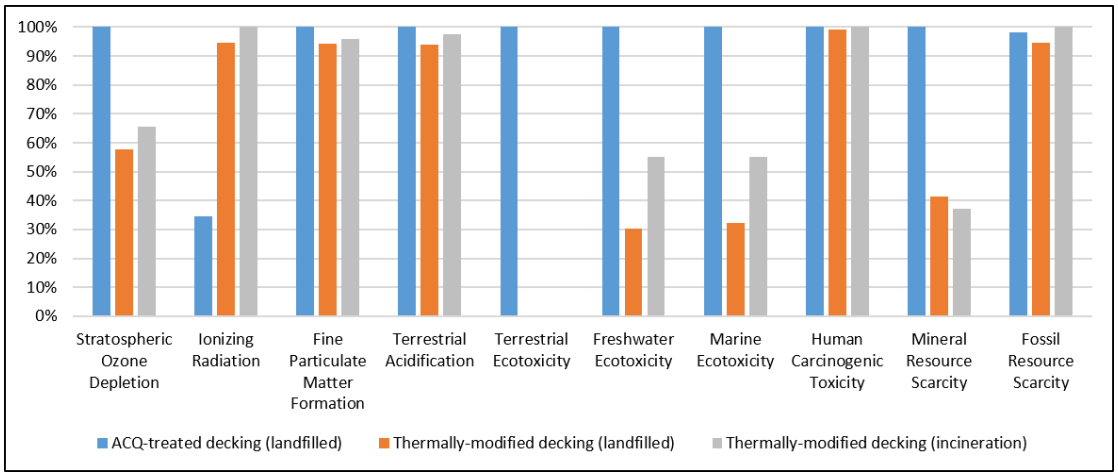


Figure 27. Comparison of the life-cycle midpoint impacts of 320 ft^2 of decking over a 25-year period, using the ReCiPe Midpoint (H) *v. 1.00* method.

As shown in Table 12 and Figure 27, the thermally-modified wood decking had an average of 38%, 5.0%, 4.3%, 99%, 57%, 56%, and 61% lower stratospheric ozone depletion, fine particulate matter formation, terrestrial acidification, terrestrial ecotoxicity, freshwater ecotoxicity, marine ecotoxicity, and mineral resource scarcity potential, respectively, than the ACQ-treated wood decking. The high stratospheric ozone depletion potential of the ACQ-treated wood decking is due primarily to the emission of N_2O during its manufacture. The high terrestrial exotoxicity potential (124 kg 1,4- DCB eq.), as well as the high freshwater and marine ecotoxicity potential of the ACQ-treated wood decking, is due primarily to the potential for leaching of copper, MEA, and DDAC components of the the ACQ preservative in the landfill. The ACQ-treated decking had the highest mineral resource scarcity potential (1.8 kg Cu eq.), with 45% of the scarcity due to copper beneficiation for use in the ACQ preservative. The thermally-modified wood decking had an average 280% higher ionizing radiation potential than the ACQ-treated wood decking, with the majority of the

impact due to the uranium tailings as a byproduct of nuclear energy production. Human carcinogenic toxicity and fossil resource scarcity potential across all decking types was similar.

In summary, comparative analyses revealed that, when comparing incineration to landfilling of the thermally-modified wood decking, the impacts were similar. However, at end-of-life, the thermally-modified wood decking had lower human health, resources, and climate change impacts than the ACQ-treated wood decking. The ACQ-treated wood decking also had lower water use impacts than the thermally-modified wood decking when landfilled and incinerated, respectively. The thermally-modified wood decking also had lower stratospheric ozone depletion, fine particulate matter formation, terrestrial acidification, terrestrial ecotoxicity, freshwater ecotoxicity, marine ecotoxicity, and mineral resource scarcity potential, respectively, than the ACQ-treated wood decking. When compared to ACQ-treated wood, the landfilling of thermally-modified wood contributed lower environmental impacts in each impact category.

3.1.2 Contribution Analysis

The following sections describe key results from the contribution analyses. The analyses identify the environmental hot-spots within each decking product system, which are the processes that contribute disproportionately to the overall life-cycle impacts of the systems. The identification of hot-spots provides a deeper understanding of what is driving the environmental performance of the

competing decking products, and also allows for the identification of opportunities for process improvement.

3.1.2.1 ACQ-Treated Wood Decking

Figure 28 presents the contribution analysis for 1 kg of ACQ-treated wood decking. As can be seen, production of the softwood boards accounts for a large portion of the total impact in each impact category, contributing 63%, 35%, 41%, and 51% of the impacts in the human health, resources, cumulative energy demand, and climate change impact categories, respectively. The next largest contributor to the total impacts was the ACQ preservative itself, contributing 20% and 60% of the impacts in the human health and water use impact categories, respectively. Diesel combustion accounted for 3.8% to 13% of the total impact in each impact category, while diesel truck transport accounted for 3.0% to 11% of the total impact in each category.

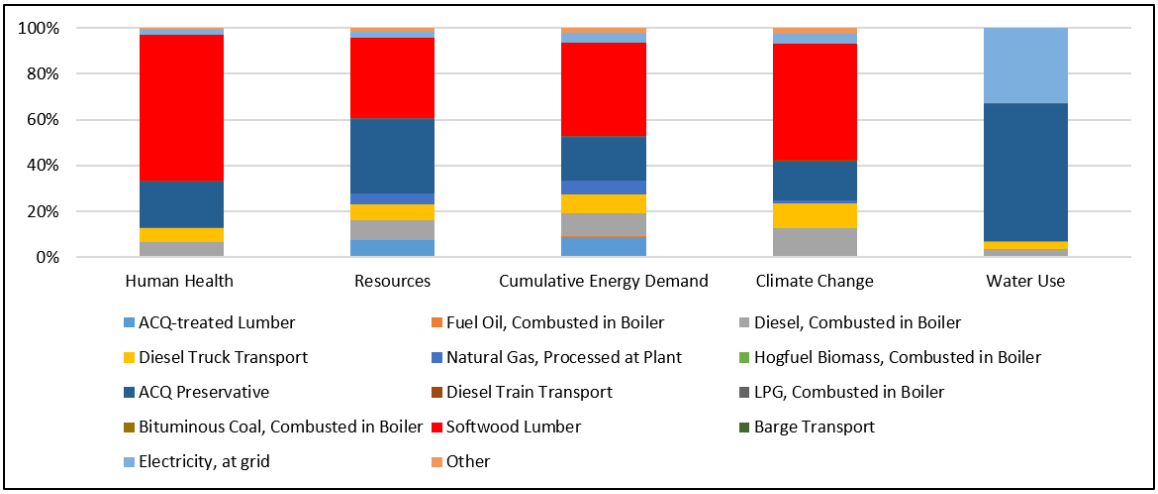


Figure 28. Contribution analysis for 1 kg of ACQ-treated wood decking, using the LTS method.

3.1.2.2 Thermally-Modified Wood Decking

A contribution analysis for 1 kg of thermally-modified wood decking is presented in Figure 29. As can be seen, production of the softwood boards accounted for a large portion of the total impact in each impact category, contributing 71%, 46%, 43%, and 45% of the impacts in the human health, resources, cumulative energy demand, and climate change impact categories, respectively. The next largest contributor to the total impacts was combusted fuel oil, contributing 22% to 44% of the total impacts in each category, except for water use. Electricity use accounted for 8% to 15% of total impacts in each category except water use, where it accounted for 91% of total impact.

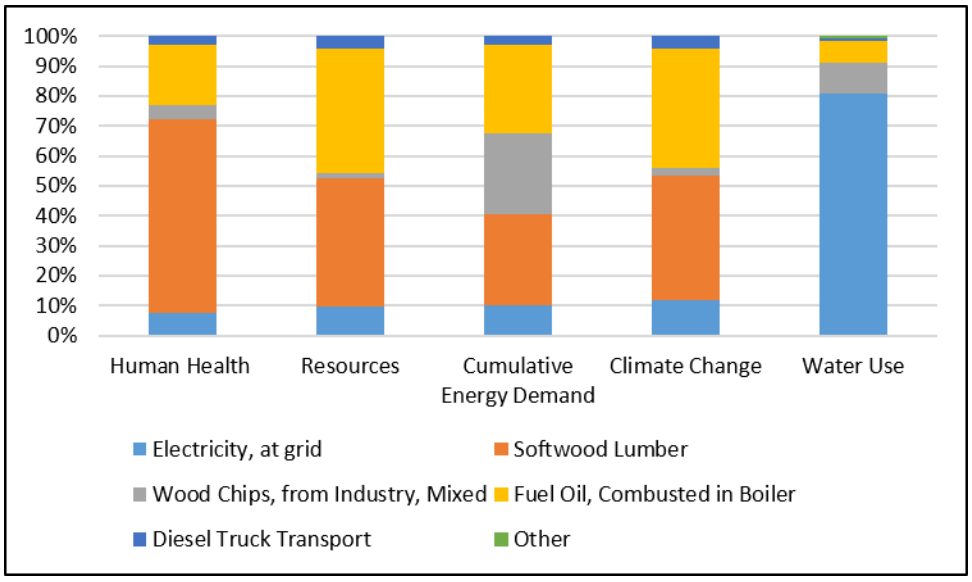


Figure 29. Contribution analysis for 1 kg of thermally-modified wood decking, using the LTS method.

In summary, contribution analyses revealed that for the ACQ-treated wood decking, production of the softwood boards accounted for a large portion of the total impact in each impact category. The next largest contributor to the total

impacts was the ACQ preservative itself, contributing 20% and 60% of the impacts in the human health and water use impact categories, respectively. For the thermally-modified wood decking, production of the softwood boards also accounted for a large portion of the total impact in each impact category, contributing 71%, 46%, 43%, and 45% of the impacts in the human health, resources, cumulative energy demand, and climate change impact categories, respectively. The next largest contributor to the total impacts was combusted fuel oil to heat the thermal-modification equipment.

3.1.3 Sensitivity Analysis

A sensitivity analysis determines how sensitive the LCA results are to changes in the inventory data. In particular, it assesses the reliability of the conclusions and results by determining how they change due to data uncertainties, allocation methods, or calculation of indicator results (ISO, 2006b).

3.1.3.1 Amount of Sealer

The LCA results presented above are based on the assumption that the homeowner applies the sealer every five years, for a total of five applications. However, in reality, it is very possible that the sealer would not be applied that often, likely due to homeowner neglect. Thus, the LCA was recalculated on the assumption that the sealer was only applied three times over each deck's life cycle. The results for the ACQ-treated and thermally-modified wood decking are presented in Tables 13 and 14, respectively. As can be seen, by reducing the

number of sealer applications, the environmental profile of each decking material improved in each impact category. This might incentivize the homeowner to reduce the number of sealer applications; however, the aesthetics and durability of the decking products may be compromised, possibly leading to reduced consumer satisfaction. (Note: this analysis still assumes the deck is used for 25 years.)

Impact Category	Unit	5 sealer applications	3 sealer applications	% improvement
Human Health	DALY	1.04×10^{-3}	9.74×10^{-4}	6.3%
Resources	$/kg	23.3	21.7	6.9%
Cumulative Energy Demand	MJ	5.83×10^{3}	5.27×10^{3}	9.6%
Climate Change	kg CO_2 eq.	360	325	9.7%
Water Use	m^3	4.15×10^{3}	3.90×10^{3}	6.0%

Table 13. Sensitivity of ACQ-treated wood decking LCA results to rate of sealer application, using the LTS method.

Impact Category	Unit	5 sealer applications	3 sealer applications	% improvement
Human Health	DALY	8.6×10^{-4}	8.5×10^{-4}	1.2%
Resources	$/kg	20.6	19.1	7.3%
Cumulative Energy Demand	MJ	5.54×10^{3}	5.12×10^{3}	7.6%
Climate Change	kg CO_2 eq.	319	315	1.3%
Water Use	m^3	6.98×10^{3}	6.85×10^{3}	1.9%

Table 14. Sensitivity of thermally-modified wood decking LCA results to rate of sealer application, using the LTS method.

3.1.3.2 Thermally-Modified Wood Transportation

The base LCA model assumed that the thermal-modification plant is at the site of the sawmill, thus no transportation of softwood boards was required. (This is typical of many commercial plants.) However, to test the sensitivity of transportation changes, the LCA model was recalculated to assume the softwood

boards traveled 100 miles from the sawmill to the thermal-modification plant. The results are shown in Table 15, below. As can be seen, if the sawmill and thermal-modification plant are located on the same site, the impacts across each impact category are improved from 1.2% to 4.7%. Obviously, minimizing the transport of wood (and all other product components) would improve the environmental profile of the decking material.

Impact Category	Unit	0 miles of transportation	100 miles of transportation	% penalty (0 mi vs. 100 mi)
Human Health	DALY	1.01×10^{-6}	1.04×10^{-6}	2.9%
Resources	$/kg	0.0172	0.018	4.7%
Cumulative Energy Demand	MJ	4.86	5.07	4.3%
Climate Change	kg CO_2 eq.	0.332	0.347	4.5%
Water Use	m^3	6.60	6.68	1.2%

Table 15. Sensitivity of thermally-modified wood decking to amount of transportation required between the sawmill and the thermal-modification plant, using the LTS method.

3.1.3.3 Thermal-Modification Plant Fuel Type

The base assumption in the LCA was that the thermal-modification plant equipment was heated with fuel oil (as per real-world operational data from a commercial plant in Europe). However, it is possible to use other fuel sources to provide the heat, such as propane, electricity, or biomass. In this sensitivity analysis, it was assumed that the plant equipment was heated by a mix of industry-provided wood chips (72% softwood, 28% hardwood) at 40% moisture content with a bulk density of 189 kg/m^3 and combusted in a boiler with 100 kW to 700 kW capacity. The results are shown in Figure 30.

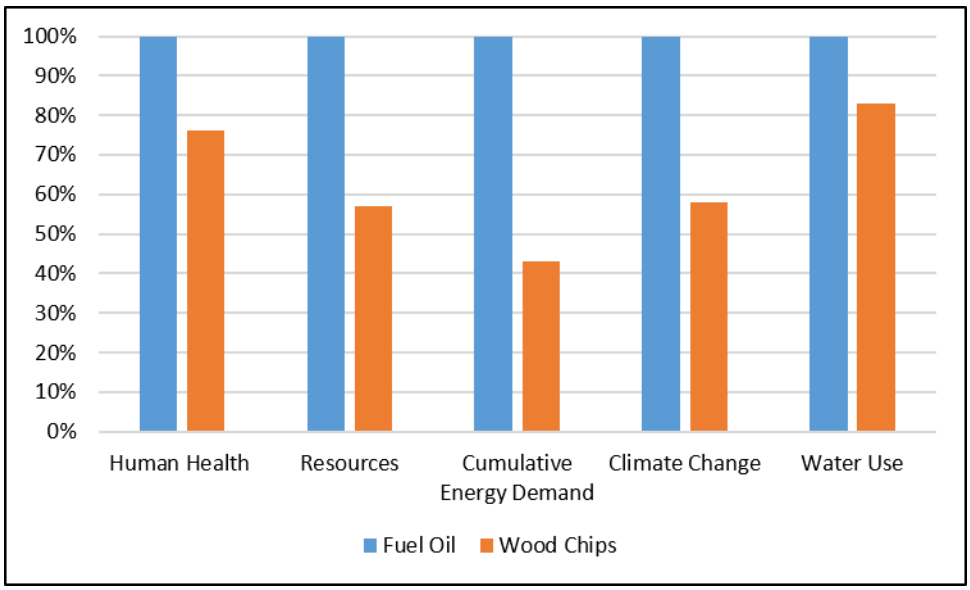


Figure 30. Comparison of utilizing fuel oil and wood chips to heat the thermal-modification plant equipment, using the LTS method.

As can be seen, the impacts in each category are substantially reduced by substituting wood chips for fuel oil to heat the thermal-modification plant equipment. Specifically, the impacts are reduced 24%, 43%, 57%, 42%, and 17% in the human health, resources, cumulative energy demand, climate change, and water use categories, respectively. The improvement in the human health and climate change impact categories is due primarily to reduced fossil fuel-combustion emissions, while the improvement in the resources and cumulative energy demand impact categories is due primarily to the reduced need for fossil-based feedstock for production of the fuel oil. Based on these results, it is reasonable to suggest, therefore, that a thermal-modification plant owner/operator could substitute petroleum-based fuels for biomass to reduce environmental burden. This analysis, however, assumes that the wood chips are produced at the thermal-modification plant site.

3.1.3.4 Infrastructure

In most LCA studies, capital goods and infrastructure are often not included because they typically contribute a small portion to the overall environmental burden of the product or system being studied (Goedkoop et al., 2013b). Thus, the LCA results reported in this study did not include infrastructure. However, the analysis was repeated to test the sensitivity of the LCA results to the inclusion of infrastructure processes. Tables 16-18 present the life-cycle impacts of the three decking products, both with and without infrastructure included.

Impact Category	Unit	ACQ-treated decking (landfilled), infrastructure not included	ACQ-treated decking (landfilled), infrastructure included	% penalty (infrastructure included v. infrastructure not included)
Human Health	DALY	1.08×10^{-3}	1.2×10^{-3}	11%
Resources	$/kg	22.1	25.2	14%
Cumulative Energy Demand	MJ	5.34×10^{3}	6.28×10^{3}	18%
Climate Change	kg CO_2 eq.	382	449	18%
Water Use	m^3	3.79×10^{3}	6.37×10^{3}	68%

Table 16. Sensitivity of the ACQ-treated wood decking life-cycle impacts to inclusion of infrastructure processes, using the LTS method.

Impact Category	Unit	Thermally-modified decking (landfilled), infrastructure not included	Thermally-modified decking (landfilled), infrastructure included	% penalty (infrastructure included v. infrastructure not included)
Human Health	DALY	9.29×10^{-4}	1.05×10^{-3}	13%
Resources	$/kg	19.3	23	19%
Cumulative Energy Demand	MJ	5.16×10^{3}	7.17×10^{3}	39%
Climate Change	kg CO_2 eq.	358	405	13%
Water Use	m^3	6.72×10^{3}	9.98×10^{3}	49%

Table 17. Sensitivity of the thermally-modified wood decking life-cycle impacts (when landfilled) to inclusion of infrastructure processes, using the LTS method.

Impact Category	Unit	Thermally-modified decking (incinerated), infrastructure not included	Thermally-modified decking (incinerated), infrastructure included	% penalty (infrastructure included v. infrastructure not included)
Human Health	DALY	9.26×10^{-4}	1.04×10^{-3}	12%
Resources	$/kg	20.3	24.2	19%
Cumulative Energy Demand	MJ	5.47×10^{3}	7.50×10^{3}	37%
Climate Change	kg CO_2 eq.	337	380	13%
Water Use	m^3	6.92×10^{3}	1.03×10^{4}	49%

Table 18. Sensitivity of the thermally-modified wood decking life-cycle impacts (when incinerated) to inclusion of infrastructure processes, using the LTS method.

As expected, the impacts across all impact categories increased when infrastructure processes were included in the LCA. The large water use impact penalty for each product, as noted in Tables 16-18, is due primarily to water use for powering the hydropower turbines, as well as hydropower cooling water demands. The 39% and 37% penalty in the cumulative energy demand impact category for the landfilled and incinerated thermally-modified wood decking as shown in Tables 17 and 18, respectively, is due primarily to the infrastructure

required for collecting and processing of the petroleum-based feedstock for producing the fuel oil to heat the thermal-modification kiln.

In summary, sensitivity analyses revealed that heating the thermal-modification plant equipment with a mix of hardwood and softwood chips would substantially reduce the overall environmental impacts of the product. It is reasonable to suggest, therefore, that a thermal-modification plant owner/operator could substitute petroleum-based fuels for biomass to reduce environmental burden. In addition, when infrastructure was included in the analyses, the thermally-modified wood decking, whether landfilled or incinerated at end-of-life, had lower impacts in the human health, resources, and climate change impact categories than the ACQ-treated wood decking. However, the thermally-modified wood decking had greater impacts than the ACQ-treated wood decking in the cumulative energy demand and water use categories. As expected, the impacts across all impact categories increased when infrastructure processes were included in the LCA.

3.1.4 Uncertainty Analysis

Uncertainty analysis is a procedure to quantify the uncertainty introduced in the results of a life-cycle inventory analysis due to the cumulative effects of model imprecision, input uncertainty, and data variability (ISO, 2006b). Data ranges or probability ranges are most often used to determine uncertainty in the LCA results. Some uncertainty factors include reliability, completeness, temporal correlation, geographical correlation, and other technological correlation

(Earthshift Sustainability, 2015). Once these factors are considered, a distribution and standard deviation are defined based on data reliability, completeness, temporal, and geographic factors. Then a Monte Carlo analysis can be completed by randomly choosing a series of values according to the distribution and recalculating the LCA results for every parameter.

In this study, a Monte Carlo analysis was completed to help determine whether the differences between the decking types were statistically significant or not (at the 95% confidence level). The analysis was completed by selecting random inventory variables (with a lognormal distribution) and recalculating the LCA results 1,000 times with a 95% confidence interval. The results of the comparison between the ACQ-treated wood decking and the thermally-modified wood decking (when landfilled) are presented in Figure 31. As shown, over 90% of the Monte Carlo runs favor one of the decking types in each of the impact categories, meaning the difference between the two products is statistically significant. Since the results here are significant, LCA practitioners would consider the inventory data to be sufficient and robust (Goedkoop et al., 2013b).

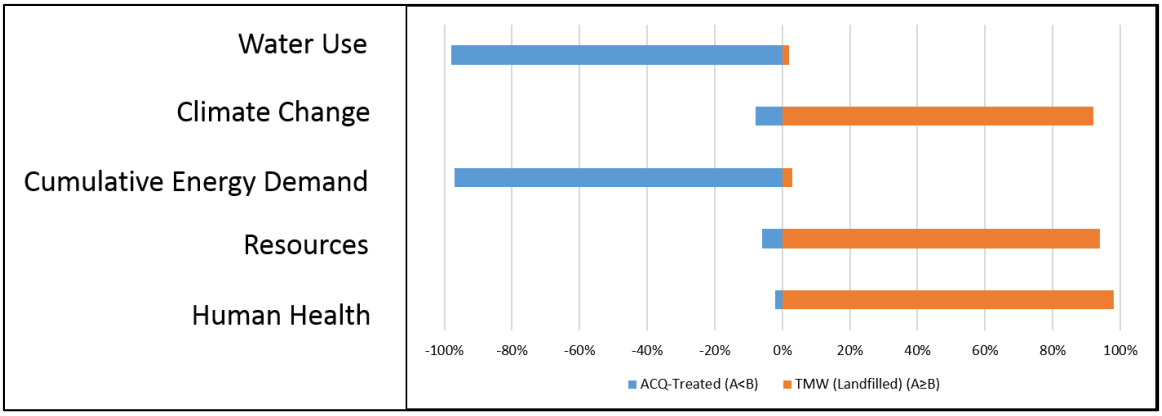


Figure 31. Monte Carlo comparison between ACQ-treated wood decking (blue) and landfilled thermally-modified wood decking (orange), using the LTS method.

Figure 32 presents the Monte Carlo comparison of the ACQ-treated wood decking and the thermally-modified wood decking (when incinerated). As shown, over 90% of the Monte Carlo runs favor one of the decking types over the other in most impact categories. This means the difference between the two products are considered statistically significant in all categories, except resources.

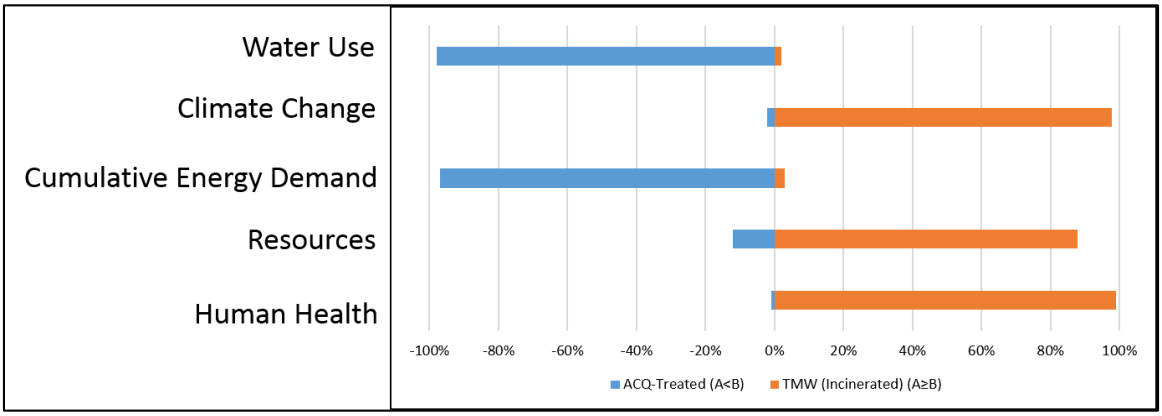


Figure 32. Monte Carlo comparison between ACQ-treated wood decking (blue) and incinerated thermally-modified wood decking (orange), using the LTS method.

The Monte Carlo comparison of the thermally-modified wood decking when landfilled and incinerated is shown in Figure 33. As shown, over 90% of the

Monte Carlo runs favor one of the decking types over the other in most impact categories. This means the difference between the two products are considered significant in all categories, except human health.

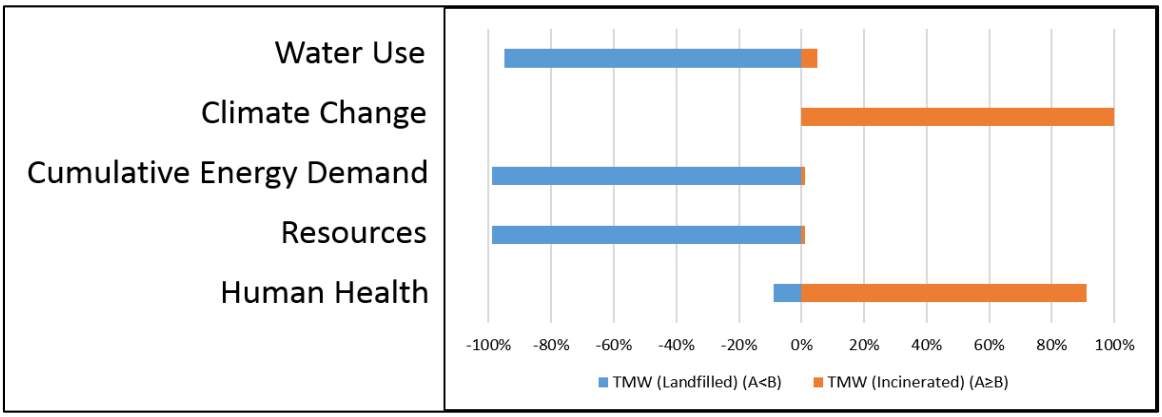


Figure 33. Monte Carlo comparison between landfilled thermally-modified wood decking (blue) and incinerated thermally-modified wood decking (orange), using the LTS method.

Chapter 4. DISCUSSION AND CONCLUSIONS

While production volumes and utilization of thermally-modified wood decking is increasing in the U.S., unsubstantiated claims on the environmental impacts of the decking products still exist. This is due, in large part, to the lack of studies reporting the life-cycle environmental impacts of thermally-modified wood products, whether produced using the non-pressurized ("open") or pressurized ("closed") hygrothermal-modification process, as studied in this research. It is important to address this knowledge gap so manufacturers can better understand what steps of the manufacturing process contribute significant loads to the decking products' overall environmental burden, leading to identification of potential opportunities for modifying and improving the manufacturing process to reduce those burdens. In addition, with the new environmental impact data, retailers/distributors may be able to more effectively market the decking products, especially to consumers that are increasingly demanding more environmentally-friendly products. Ultimately, this research may help to catalyze new U.S. market opportunities for thermally-modified wood, leading to new wealth and economic opportunity in rural communities.

In this study, a comparative LCA of hygrothermally-modified softwood exterior decking and ACQ-treated softwood exterior decking was completed following International Organization for Standardization (ISO) 14040 (ISO, 2006a) and 14044 (ISO, 2006b) guidelines. The study revealed that the environmental impacts of thermally-modified wood decking, whether landfilled or incinerated at end-of-life, were very similar. The thermally-modified wood decking also had

lower human health, resources, and climate change impacts than landfilled ACQ-treated wood decking; however, the ACQ-treated wood decking had lower water use impacts than the thermally-modified wood decking. The thermally-modified wood decking also had lower stratospheric ozone depletion, fine particulate matter formation, terrestrial acidification, terrestrial ecotoxicity, freshwater ecotoxicity, marine ecotoxicity, and mineral resource scarcity potential than the ACQ-treated wood decking.

As previously noted, production of the softwood boards contributes a majority of the environmental impacts for the thermally-modified wood. Future research could, therefore, focus on improving the efficiencies and environmental profile of the wood harvesting and lumber production processes. However, it is likely that many commercial thermally-modified wood producers (the main audience for this research) have little influence on how the softwood trees are harvested and how the sawmill manufactures the lumber (except for those thermally-modified wood producers that are owned/operated by the lumber producers themselves). Therefore, it is reasonable to suggest that thermally-modified wood producers should focus on improving the environmental profile of their manufacturing processes. As revealed in this research, substituting a mix of hardwood and softwood chips to heat the thermal-modification equipment (as opposed to fuel oil) substantially reduced the impacts in the human health, resources, cumulative energy demand, climate change, and water use impact categories. Future LCA research could, therefore, model the impacts of utilizing non petroleum-based

fuels in the manufacturing process; for example, selection of different energy sources (e.g., wood chip species mix, wood pellet fuels, torrefied wood briquettes, electricity from renewables) and boiler efficiencies could be studied to identify how they may improve the environmental profile of the thermally-modified wood products.

Likewise, even though the manufacture of the ACQ preservative itself contributes a large portion of the total impacts in each impact category for the ACQ-treated wood decking, the decking manufacturers likely have little influence on how the ACQ preservative is manufactured. Future work could, however, focus on experimenting with various ACQ preservative loading levels to understand their impact on the long-term performance of the decking, with the goal of using less preservative in the finished product.

A direct comparion of this study's results to previous research by others is not fully possible because there are no known LCAs on wood that was thermally modified using the pressurized ("closed") hygrothermal-modification process. However, the results are generally consistent with Tran (2005) who reported that ThermoWood®-brand thermally-modified spruce and pine exterior cladding was comparable or superior to wood treated with a chromium-free organic salt preservative. However, the Tran study's system boundary did not include growing and harvesting of trees, nor drying of the lumber. Tran also reported that both types of ThermoWood® had a negative global warming impact due to

the fact that wood products sequester carbon during their service-life. This contradicts the current study, perhaps due to the fact that it included a full cradle-to-grave assessment; thus, the environmental burdens of growing and harvesting trees was included.

While Ferreira et al. (2014) also conducted an LCA of ThermoWood® maritime pine wood cladding, they did not compare it to preservative-treated wood. However, they did report that the largest contributor to climate change impacts was liquefied petroleum gas (LPG) heat and consumption of electricity to power the thermal-modification process. These results are similar to the current study where the two largest contributors to climate change impacts were production of softwood (45% of impacts) and combustion of fuel oil (44%) to heat the thermal-modification equipment.

Consumers have many options to choose from when selecting an exterior decking product, in addition to the thermally-modified and ACQ-treated wood decking studied here. Factors that may be taken into account include, but are not limited to, availability, cost, aesthetics, and environmental performance. Ultimately, value judgments are made when the product is selected, because each customer weights each of these factors differently. From an environmental standpoint, it is difficult to explicitly state that thermally-modified wood decking has better environmental performance than ACQ-treated wood decking because, while it performs better in some impact categories, the ACQ-treated wood decking performs better in others. Ultimately, when selecting a decking product,

the consumer has to decide which specific impact categories matter most to them, while also weighing the importance of the other factors (i.e., cost and aesthetics).

There is inherent uncertainty in these (and all) LCA results, particularly due to complicated environmental fate and transport modeling of emitted substances and pollutants; biophysical effects of emitted substances and pollutants on humans (via inhalation, ingestion, and dermal absorption) and ecosystems; and the pollutants' actual effects on humans based on dose-effect tests. Also, this study only assessed the hygrothermal, pressurized ("closed") thermal-modification process; thus, the results may not be directly applicable to the more-well-known atmospheric ("open") process. The study also relied on commercial-scale production process data from one thermal-modification technology provider; it is possible that if data from other providers was used, the LCA results would be different. Further, changing the expected deck life would impact the overall LCA results. For example, if the expected deck life was 12.5 years (as opposed to 25 years as used in this study), twice as many inputs (e.g., materials, energy, water, etc.) and outputs (e.g., wastes and emissions to air, soil, and water) would be required in the study to account for the fact that two decks would need to be constructed and disposed of to provide the required 25 years of service.

In summary, this research, which is the first known LCA of wood that was thermally-modified using the pressurized, hygrothermal ("closed") process, revealed that thermally-modified wood decking had lower human health, resources, and climate change impacts than landfilled ACQ-treated wood decking; however, the ACQ-treated wood decking had lower water use impacts than the thermally-modified wood decking. This – and future – research helps fill the knowledge gap so manufacturers can more effectively identify possible ways to improve the environmental profile of their manufacturing processes, which may allow retailers and distributors to more effectively market the products against competing alternatives.

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Appendix 1

Full Life-Cycle Inventory for ACQ-Treated Wood Decking

Substance	Compartment	Unit	Total	ACQ-treated deck (20' x 16')	Landfill scenario for ACQ-treated wood deck
Aluminium	Raw	g	22.453	21.626	0.827
Anhydrite	Raw	mg	45.713	45.548	0.165
Argon	Raw	g	11.849	11.849	0.000
Barite	Raw	g	4.500	4.494	0.006
Basalt	Raw	mg	173.196	173.207	-0.011
Borax	Raw	µg	769.847	784.405	-14.558
Bromine	Raw	g	136.207	136.207	0.000
Cadmium	Raw	mg	39.813	39.691	0.123
Calcite	Raw	kg	2.339	2.328	0.011
Carbon dioxide, in air	Raw	kg	514.849	514.853	-0.004
Carbon, organic, in soil or biomass stock	Raw	kg	7.396	7.396	0.000
Carnallite	Raw	g	2.154	2.154	0.000
Cerium	Raw	µg	88.132	88.132	0.000
Chromium	Raw	g	129.565	116.998	12.567
Chrysotile	Raw	mg	51.156	51.154	0.001
Cinnabar	Raw	mg	4.446	4.437	0.009
Clay	Raw	g	8.766	7.618	1.149
Clay, bentonite	Raw	g	46.440	46.154	0.286
Clay, unspecified	Raw	g	40.165	40.165	0.000
Coal, 26.4 MJ per kg	Raw	kg	22.194	21.778	0.416
Coal, brown	Raw	kg	1.133	1.133	0.000
Coal, hard	Raw	kg	11.169	11.962	-0.793
Cobalt	Raw	µg	848.409	825.735	22.674
Cobalt, Co 5.0E-2%, in mixed ore	Raw	µg	746.250	746.250	0.000
Colemanite	Raw	g	8.961	8.961	0.000
Copper, 0.52% in sulfide, Cu 0.27% and Mo 8.2E-3% in crude ore	Raw	g	6.011	6.011	0.000
Copper, 0.59% in sulfide, Cu 0.22% and Mo 8.2E-3% in crude ore	Raw	g	8.436	8.436	0.000
Copper, 0.97% in sulfide, Cu 0.36% and Mo 4.1E-2% in crude ore	Raw	g	9.040	9.040	0.000
Copper, 0.99% in sulfide, Cu 0.36% and Mo 8.2E-3% in crude ore	Raw	g	43.671	43.671	0.000
Copper, 1.13% in sulfide, Cu 0.76% and Ni 0.76% in crude ore	Raw	mg	429.810	429.810	0.000
Copper, 1.18% in sulfide, Cu 0.39% and Mo 8.2E-3% in crude ore	Raw	g	250.746	250.746	0.000
Copper, 1.42% in sulfide, Cu 0.81% and Mo 8.2E-3% in crude ore	Raw	g	63.872	63.872	0.000
Copper, 2.19% in sulfide, Cu 1.83% and Mo 8.2E-3% in crude ore	Raw	g	316.635	316.635	0.000
Copper, Cu 0.2%, in mixed ore	Raw	µg	397.207	397.207	0.000
Copper, Cu 0.38%, Au 9.7E-4%, Ag 9.7E-4%, Zn 0.63%, Pb 0.014%, in ore	Raw	mg	65.206	65.206	0.000
Copper, Cu 3.2E+0%, Pt 2.5E-4%, Pd 7.3E-4%, Rh 2.0E-5%, Ni 2.3E+0% in ore	Raw	mg	10.148	10.148	0.000
Copper, Cu 5.2E-2%, Pt 4.8E-4%, Pd 2.0E-4%, Rh 2.4E-5%, Ni 3.7E-2% in ore	Raw	mg	42.255	42.255	0.000
Diatomite	Raw	µg	34.117	34.122	-0.004
Dolomite	Raw	g	267.788	267.687	0.100
Electricity usage	Raw	MJ	90.417	101.189	-10.772
Energy, from hydro power	Raw	MJ	2.513	2.513	0.000
Energy, geothermal, converted	Raw	kJ	197.435	197.435	0.000
Energy, gross calorific value, in biomass	Raw	MJ	183.474	183.675	-0.202
Energy, gross calorific value, in biomass, primary forest	Raw	MJ	94.455	94.455	0.000
Energy, kinetic (in wind), converted	Raw	MJ	4.619	4.962	-0.342
Energy, potential (in hydropower reservoir), converted	Raw	MJ	23.160	23.575	-0.415
Energy, solar, converted	Raw	kJ	308.361	312.195	-3.834
Energy, unspecified	Raw	MJ	1.429	0.190	1.240

Europium	Raw	ng	220.801	220.801	0.000
Feldspar	Raw	µg	450.416	447.587	2.829
Fluorine	Raw	g	9.987	9.986	0.000
Fluorine, 4.5% in apatite, 3% in crude ore	Raw	g	10.979	10.978	0.000
Fluorspar	Raw	g	12.688	12.698	-0.010
Gadolinium	Raw	ng	551.059	551.059	0.000
Gallium	Raw	ng	2.431	2.431	0.000
Gangue, bauxite	Raw	g	170.490	170.490	0.000
Gas, mine, off-gas, process, coal mining/m3	Raw	dm3	83.193	88.217	-5.024
Gas, natural, 46.8 MJ per kg	Raw	g	113.628	113.628	0.000
Gas, natural/kg	Raw	g	2.113	0.000	2.113
Gas, natural/m3	Raw	m3	29.279	35.936	-6.656
Gold	Raw	µg	19.177	19.177	0.000
Gold, Au 1.0E-7%, in mixed ore	Raw	ng	153.943	153.943	0.000
Gold, Au 1.1E-4%, Ag 4.2E-3%, in ore	Raw	µg	4.525	4.526	0.000
Gold, Au 1.3E-4%, Ag 4.6E-5%, in ore	Raw	µg	6.461	6.461	0.000
Gold, Au 1.8E-4%, in mixed ore	Raw	ng	474.090	474.090	0.000
Gold, Au 2.1E-4%, Ag 2.1E-4%, in ore	Raw	µg	1.454	1.454	0.000
Gold, Au 4.3E-4%, in ore	Raw	µg	3.750	3.750	0.000
Gold, Au 4.9E-5%, in ore	Raw	µg	18.770	18.771	0.000
Gold, Au 5.4E-4%, Ag 1.5E-5%, in ore	Raw	ng	169.987	169.987	0.000
Gold, Au 6.7E-4%, in ore	Raw	µg	20.038	20.039	0.000
Gold, Au 6.8E-4%, Ag 1.5E-4%, in ore	Raw	ng	230.997	230.997	0.000
Gold, Au 7.1E-4%, in ore	Raw	µg	9.314	9.314	0.000
Gold, Au 9.7E-4%, Ag 9.7E-4%, Zn 0.63%, Cu 0.38%, Pb 0.014%, in ore	Raw	µg	1.592	1.592	0.000
Gold, Au 9.7E-5%, Ag 7.6E-5%, in ore	Raw	ng	835.678	835.678	0.000
Granite	Raw	ng	448.392	448.410	-0.019
Gravel	Raw	kg	161.971	1.020	160.951
Gypsum	Raw	g	3.669	3.669	0.000
Indium	Raw	µg	663.540	661.493	2.048
Iodine	Raw	g	11.278	11.278	0.000
Iron	Raw	kg	4.046	4.019	0.027
Kaolinite	Raw	mg	557.379	559.838	-2.459
Kieserite	Raw	mg	3.639	3.516	0.123
Krypton	Raw	µg	17.931	17.931	0.000
Lanthanum	Raw	µg	26.421	26.421	0.000
Lead	Raw	mg	668.382	668.361	0.021
Lead, Pb 0.014%, Au 9.7E-4%, Ag 9.7E-4%, Zn 0.63%, Cu 0.38%, in ore	Raw	mg	7.881	7.881	0.000
Lead, Pb 3.6E-1%, in mixed ore	Raw	µg	714.950	714.950	0.000
Limestone	Raw	kg	4.174	4.171	0.003
Lithium	Raw	mg	727.014	727.014	0.000
Magnesite	Raw	g	82.007	81.430	0.577
Magnesium	Raw	ng	101.183	101.983	-0.799
Manganese	Raw	g	81.394	81.366	0.028
Metamorphous rock, graphite containing	Raw	mg	145.285	145.345	-0.060
Molybdenum	Raw	g	1.038	1.037	0.001
Molybdenum, 0.010% in sulfide, Mo 8.2E-3% and Cu 1.83% in crude ore	Raw	g	5.884	5.884	0.000
Molybdenum, 0.014% in sulfide, Mo 8.2E-3% and Cu 0.81% in crude ore	Raw	mg	839.002	839.003	0.000
Molybdenum, 0.016% in sulfide, Mo 8.2E-3% and Cu 0.27% in crude ore	Raw	mg	144.112	144.112	0.000

Molybdenum, 0.022% in sulfide, Mo 8.2E-3% and Cu 0.22% in crude ore	Raw	mg	188.429	188.429	0.000
Molybdenum, 0.022% in sulfide, Mo 8.2E-3% and Cu 0.36% in crude ore	Raw	mg	4.394	4.079	0.314
Molybdenum, 0.025% in sulfide, Mo 8.2E-3% and Cu 0.39% in crude ore	Raw	g	3.273	3.273	0.000
Neodymium	Raw	µg	14.531	14.531	0.000
Nickel, 1.13% in sulfide, Ni 0.76% and Cu 0.76% in crude ore	Raw	mg	881.269	881.442	-0.173
Nickel, 1.98% in silicates, 1.04% in crude ore	Raw	g	117.719	88.961	28.758
Nickel, Ni 2.3E+0%, Pt 2.5E-4%, Pd 7.3E-4%, Rh 2.0E-5%, Cu 3.2E+0% in ore	Raw	mg	28.587	28.587	0.000
Nickel, Ni 2.5E+0%, in mixed ore	Raw	mg	36.557	36.557	0.000
Nickel, Ni 3.7E-2%, Pt 4.8E-4%, Pd 2.0E-4%, Rh 2.4E-5%, Cu 5.2E-2% in ore	Raw	mg	3.787	3.787	0.000
Nitrogen	Raw	g	638.976	638.976	0.000
Occupation, annual crop	Raw	m2a	14.575	14.575	0.000
Occupation, annual crop, greenhouse	Raw	m2s	23.174	23.174	0.000
Occupation, annual crop, irrigated	Raw	m2a	0.913	0.913	0.000
Occupation, annual crop, irrigated, intensive	Raw	m2s	853.828	853.828	0.000
Occupation, annual crop, non-irrigated	Raw	m2a	-5.734	-5.734	0.000
Occupation, annual crop, non-irrigated, extensive	Raw	mm2a	653.202	653.202	0.000
Occupation, annual crop, non-irrigated, intensive	Raw	m2a	7.436	7.436	0.000
Occupation, arable land, unspecified use	Raw	m2s	0.000	0.000	0.000
Occupation, construction site	Raw	m2a	0.129	0.039	0.090
Occupation, dump site	Raw	m2a	0.418	0.274	0.143
Occupation, dump site, benthos	Raw	m2s	30.745	31.139	-0.394
Occupation, forest, extensive	Raw	cm2a	15.734	15.734	0.000
Occupation, forest, intensive	Raw	m2a	1.359	1.358	0.001
Occupation, forest, intensive, normal	Raw	cm2a	-877.648	-884.303	6.655
Occupation, forest, intensive, short-cycle	Raw	m2a	-4.500	-4.500	0.000
Occupation, grassland, natural (non-use)	Raw	m2s	44.580	44.580	0.000
Occupation, industrial area	Raw	cm2a	343.273	348.604	-5.332
Occupation, industrial area, benthos	Raw	m2s	0.281	0.285	-0.004
Occupation, industrial area, built up	Raw	cm2a	-14.819	-14.819	0.000
Occupation, industrial area, vegetation	Raw	m2s	-107.223	-145.684	38.461
Occupation, inland waterbody, unspecified	Raw	m2s	118.237	118.237	0.000
Occupation, mineral extraction site	Raw	cm2a	857.414	439.798	417.617
Occupation, pasture, man made, extensive	Raw	m2s	52.775	52.775	0.000
Occupation, pasture, man made, intensive	Raw	cm2a	65.513	65.513	0.000
Occupation, permanent crop	Raw	m2a	27.199	27.199	0.000
Occupation, permanent crop, fruit, intensive	Raw	m2a	-8.646	-8.646	0.000
Occupation, permanent crop, irrigated	Raw	m2a	1.346	1.346	0.000
Occupation, permanent crop, irrigated, intensive	Raw	m2s	266.571	266.571	0.000
Occupation, permanent crop, non-irrigated, intensive	Raw	m2s	34.484	34.484	0.000
Occupation, seabed, drilling and mining	Raw	m2s	0.303	0.303	0.000
Occupation, seabed, infrastructure	Raw	m2s	0.992	0.992	0.000
Occupation, shrub land, sclerophyllous	Raw	cm2a	912.900	3.640	909.259
Occupation, traffic area, rail network	Raw	m2s	128.995	129.748	-0.753
Occupation, traffic area, rail/road embankment	Raw	cm2a	260.470	260.470	0.000
Occupation, traffic area, road embankment	Raw	mm2a	-634.407	-662.080	27.673
Occupation, traffic area, road network	Raw	cm2a	943.833	943.835	-0.001
Occupation, urban, discontinuously built	Raw	m2s	86.620	86.620	0.000
Occupation, urban/industrial fallow (non-use)	Raw	m2s	17.219	17.219	0.000
Occupation, water bodies, artificial	Raw	cm2a	619.901	539.687	80.214

Occupation, water courses, artificial	Raw	cm2a	113.084	116.179	-3.095
Oil, crude	Raw	kg	76.286	69.390	6.897
Oil, crude, 42 MJ per kg	Raw	g	512.763	512.763	0.000
Olivine	Raw	mg	15.297	15.220	0.077
Oxygen	Raw	g	807.544	807.544	0.000
Palladium, Pd 1.6E-6%, in mixed ore	Raw	µg	2.443	2.443	0.000
Palladium, Pd 2.0E-4%, Pt 4.8E-4%, Rh 2.4E-5%, Ni 3.7E-2%, Cu 5.2E-2% in ore	Raw	µg	684.609	683.613	0.996
Palladium, Pd 7.3E-4%, Pt 2.5E-4%, Rh 2.0E-5%, Ni 2.3E+0%, Cu 3.2E+0% in ore	Raw	mg	1.636	1.634	0.002
Peat	Raw	g	15.155	15.073	0.082
Perlite	Raw	mg	9.826	9.826	0.000
Phosphorus	Raw	g	43.808	43.807	0.001
Phosphorus, 18% in apatite, 4% in crude ore	Raw	g	39.946	39.944	0.002
Platinum, Pt 2.5E-4%, Pd 7.3E-4%, Rh 2.0E-5%, Ni 2.3E+0%, Cu 3.2E+0% in ore	Raw	µg	18.678	18.655	0.023
Platinum, Pt 4.7E-7%, in mixed ore	Raw	ng	706.624	706.624	0.000
Platinum, Pt 4.8E-4%, Pd 2.0E-4%, Rh 2.4E-5%, Ni 3.7E-2%, Cu 5.2E-2% in ore	Raw	µg	73.262	73.180	0.082
Potassium chloride	Raw	kg	1.231	1.231	0.000
Praseodymium	Raw	µg	1.542	1.542	0.000
Pumice	Raw	mg	195.024	195.024	0.000
Rhenium	Raw	µg	45.372	45.338	0.035
Rhodium, Rh 1.6E-7%, in mixed ore	Raw	ng	239.747	239.747	0.000
Rhodium, Rh 2.0E-5%, Pt 2.5E-4%, Pd 7.3E-4%, Ni 2.3E+0%, Cu 3.2E+0% in ore	Raw	µg	15.729	15.706	0.023
Rhodium, Rh 2.4E-5%, Pt 4.8E-4%, Pd 2.0E-4%, Ni 3.7E-2%, Cu 5.2E-2% in ore	Raw	µg	49.362	49.291	0.071
Samarium	Raw	µg	1.100	1.100	0.000
Sand	Raw	mg	778.595	773.349	5.246
Shale	Raw	g	1.696	1.696	0.000
Silver, 0.007% in sulfide, Ag 0.004%, Pb, Zn, Cd, In	Raw	µg	973.392	973.394	-0.002
Silver, 3.2ppm in sulfide, Ag 1.2ppm, Cu and Te, in crude ore	Raw	ng	327.978	329.679	-1.701
Silver, Ag 1.5E-4%, Au 6.8E-4%, in ore	Raw	ng	51.847	51.847	0.000
Silver, Ag 1.5E-5%, Au 5.4E-4%, in ore	Raw	ng	4.746	4.746	0.000
Silver, Ag 1.8E-6%, in mixed ore	Raw	µg	2.726	2.726	0.000
Silver, Ag 2.1E-4%, Au 2.1E-4%, in ore	Raw	µg	1.446	1.446	0.000
Silver, Ag 4.2E-3%, Au 1.1E-4%, in ore	Raw	µg	168.912	168.913	0.000
Silver, Ag 4.6E-5%, Au 1.3E-4%, in ore	Raw	µg	2.354	2.354	0.000
Silver, Ag 5.4E-3%, in mixed ore	Raw	µg	10.808	10.808	0.000
Silver, Ag 7.6E-5%, Au 9.7E-5%, in ore	Raw	ng	654.749	654.749	0.000
Silver, Ag 9.7E-4%, Au 9.7E-4%, Zn 0.63%, Cu 0.38%, Pb 0.014%, in ore	Raw	µg	80.388	80.388	0.000
Sodium chloride	Raw	kg	1.782	1.779	0.003
Sodium nitrate	Raw	ng	55.276	19.140	36.137
Sodium sulfate	Raw	g	1.407	1.403	0.003
Spodumene	Raw	mg	1.372	1.372	0.000
Stibnite	Raw	µg	3.546	3.546	0.000
Strontium	Raw	µg	654.488	654.488	0.000
Sulfur	Raw	g	3.495	3.493	0.002
Talc	Raw	mg	62.614	62.923	-0.309
Tantalum	Raw	mg	2.497	2.497	0.000
Tellurium	Raw	ng	49.198	49.453	-0.255
Tin	Raw	mg	4.017	4.017	0.000
TiO2, 54% in ilmenite, 18% in crude ore	Raw	mg	42.090	42.090	0.000
TiO2, 54% in ilmenite, 2.6% in crude ore	Raw	g	2.890	2.927	-0.037

TiO2, 95% in rutile, 0.40% in crude ore	Raw	mg	87.942	87.906	0.036
Transformation, from annual crop	Raw	m2	18.894	18.894	0.000
Transformation, from annual crop, greenhouse	Raw	mm2	1.694	1.694	0.000
Transformation, from annual crop, irrigated, intensive	Raw	mm2	28.641	28.641	0.000
Transformation, from annual crop, non-irrigated	Raw	m2	-5.913	-5.913	0.000
Transformation, from annual crop, non-irrigated, extensive	Raw	mm2	595.685	595.685	0.000
Transformation, from annual crop, non-irrigated, fallow	Raw	mm2	0.776	0.675	0.100
Transformation, from annual crop, non-irrigated, intensive	Raw	m2	3.781	3.781	0.000
Transformation, from cropland fallow (non-use)	Raw	mm2	3.216	3.216	0.000
Transformation, from dump site, inert material landfill	Raw	mm2	276.023	2.231	273.791
Transformation, from dump site, residual material landfill	Raw	mm2	53.042	41.400	11.642
Transformation, from dump site, sanitary landfill	Raw	cm2	179.273	0.292	178.981
Transformation, from dump site, slag compartment	Raw	mm2	1.559	-0.042	1.601
Transformation, from forest, extensive	Raw	sq.in	-188.402	-188.428	0.025
Transformation, from forest, intensive	Raw	cm2	248.439	248.439	0.000
Transformation, from forest, intensive, clear-cutting	Raw	sq.in	-249.126	-249.126	0.000
Transformation, from forest, primary (non-use)	Raw	sq.in	305.391	305.391	0.000
Transformation, from forest, secondary (non-use)	Raw	sq.in	555.157	555.157	0.000
Transformation, from forest, unspecified	Raw	mm2	141.994	141.942	0.052
Transformation, from grassland, natural (non-use)	Raw	cm2	40.165	40.165	0.000
Transformation, from heterogeneous, agricultural	Raw	mm2	0.000	0.000	0.000
Transformation, from industrial area	Raw	mm2	50.601	51.645	-1.044
Transformation, from industrial area, benthos	Raw	mm2	0.000	0.000	0.000
Transformation, from industrial area, built up	Raw	mm2	0.456	0.456	0.001
Transformation, from industrial area, vegetation	Raw	mm2	0.778	0.777	0.001
Transformation, from mineral extraction site	Raw	cm2	16.342	3.208	13.134
Transformation, from pasture, man made	Raw	cm2	186.217	4.382	181.835
Transformation, from pasture, man made, extensive	Raw	mm2	0.033	0.033	0.000
Transformation, from pasture, man made, intensive	Raw	cm2	10.143	10.143	0.000
Transformation, from permanent crop	Raw	m2	1.551	1.551	0.000
Transformation, from permanent crop, irrigated	Raw	cm2	671.245	671.245	0.000
Transformation, from permanent crop, irrigated, intensive	Raw	mm2	7.388	7.388	0.000
Transformation, from permanent crop, non-irrigated, intensive	Raw	mm2	1.093	1.093	0.000
Transformation, from seabed, infrastructure	Raw	mm2	0.000	0.000	0.000
Transformation, from seabed, unspecified	Raw	mm2	1.189	1.201	-0.012
Transformation, from shrub land, sclerophyllous	Raw	cm2	28.693	2.086	26.607
Transformation, from traffic area, rail/road embankment	Raw	mm2	36.360	36.360	0.000
Transformation, from traffic area, road network	Raw	mm2	0.006	0.006	0.000
Transformation, from tropical rain forest	Raw	sq.in	-249.126	-249.126	0.000
Transformation, from unknown	Raw	cm2	88.013	34.946	53.067
Transformation, from unspecified, natural	Raw	mm2	0.001	0.001	0.000
Transformation, from wetland, inland (non-use)	Raw	mm2	120.984	120.984	0.000
Transformation, to annual crop	Raw	m2	8.440	8.440	0.000
Transformation, to annual crop, fallow	Raw	mm2	4.360	4.360	0.000
Transformation, to annual crop, greenhouse	Raw	mm2	1.694	1.694	0.000
Transformation, to annual crop, irrigated, extensive	Raw	mm2	1.511	1.511	0.000
Transformation, to annual crop, irrigated, intensive	Raw	mm2	59.742	59.742	0.000
Transformation, to annual crop, non-irrigated	Raw	m2	-5.915	-5.915	0.000
Transformation, to annual crop, non-irrigated, extensive	Raw	mm2	780.764	780.764	0.000

Transformation, to annual crop, non-irrigated, fallow	Raw	mm2	0.868	0.756	0.112
Transformation, to annual crop, non-irrigated, intensive	Raw	m2	14.500	14.500	0.000
Transformation, to dump site	Raw	cm2	20.792	21.510	-0.718
Transformation, to dump site, benthos	Raw	mm2	0.975	0.987	-0.012
Transformation, to dump site, inert material landfill	Raw	mm2	276.023	2.231	273.791
Transformation, to dump site, residual material landfill	Raw	mm2	53.043	41.401	11.642
Transformation, to dump site, sanitary landfill	Raw	cm2	179.273	0.292	178.981
Transformation, to dump site, slag compartment	Raw	mm2	1.559	-0.042	1.601
Transformation, to forest, extensive	Raw	mm2	14.632	14.632	0.000
Transformation, to forest, intensive	Raw	cm2	474.469	474.384	0.085
Transformation, to forest, intensive, clear-cutting	Raw	sq.in	-249.126	-249.126	0.000
Transformation, to forest, intensive, normal	Raw	mm2	-648.617	-656.198	7.581
Transformation, to forest, intensive, short-cycle	Raw	sq.in	-249.126	-249.126	0.000
Transformation, to forest, secondary (non-use)	Raw	mm2	0.007	0.007	0.000
Transformation, to forest, unspecified	Raw	cm2	40.995	1.243	39.752
Transformation, to grassland, natural (non-use)	Raw	mm2	0.105	0.105	0.000
Transformation, to heterogeneous, agricultural	Raw	mm2	0.141	0.142	-0.001
Transformation, to industrial area	Raw	mm2	223.471	228.719	-5.248
Transformation, to industrial area, benthos	Raw	mm2	0.002	0.002	0.000
Transformation, to industrial area, built up	Raw	mm2	2.543	2.692	-0.149
Transformation, to industrial area, vegetation	Raw	mm2	0.398	0.386	0.013
Transformation, to inland waterbody, unspecified	Raw	mm2	0.037	0.037	0.000
Transformation, to mineral extraction site	Raw	cm2	54.681	10.320	44.361
Transformation, to pasture, man made	Raw	mm2	188.348	188.341	0.007
Transformation, to pasture, man made, extensive	Raw	mm2	0.033	0.033	0.000
Transformation, to pasture, man made, intensive	Raw	mm2	432.604	432.604	0.000
Transformation, to permanent crop	Raw	m2	1.826	1.826	0.000
Transformation, to permanent crop, fruit, intensive	Raw	sq.in	-188.661	-188.661	0.000
Transformation, to permanent crop, irrigated	Raw	cm2	671.245	671.245	0.000
Transformation, to permanent crop, irrigated, intensive	Raw	mm2	7.388	7.388	0.000
Transformation, to permanent crop, non-irrigated	Raw	mm2	0.007	0.007	0.000
Transformation, to permanent crop, non-irrigated, intensive	Raw	mm2	1.093	1.093	0.000
Transformation, to sea and ocean	Raw	mm2	0.000	0.000	0.000
Transformation, to seabed, drilling and mining	Raw	mm2	0.010	0.010	0.000
Transformation, to seabed, infrastructure	Raw	mm2	0.203	0.203	0.000
Transformation, to seabed, unspecified	Raw	mm2	0.000	0.000	0.000
Transformation, to shrub land, sclerophyllous	Raw	cm2	182.579	0.727	181.852
Transformation, to traffic area, rail network	Raw	mm2	0.009	0.010	0.000
Transformation, to traffic area, rail/road embankment	Raw	mm2	121.353	121.353	0.000
Transformation, to traffic area, road embankment	Raw	mm2	-4.871	-5.087	0.216
Transformation, to traffic area, road network	Raw	mm2	112.280	112.282	-0.002
Transformation, to unknown	Raw	mm2	60.382	61.300	-0.918
Transformation, to urban, discontinuously built	Raw	mm2	0.057	0.057	0.000
Transformation, to urban/industrial fallow	Raw	mm2	0.007	0.007	0.000
Transformation, to water bodies, artificial	Raw	cm2	14.123	4.530	9.594
Transformation, to water courses, artificial	Raw	mm2	139.970	143.802	-3.831
Transformation, to wetland, inland (non-use)	Raw	mm2	0.022	0.022	0.000
Ulexite	Raw	µg	843.575	843.586	-0.011
Uranium	Raw	mg	195.741	213.041	-17.301

Uranium oxide, 332 GJ per kg, in ore	Raw	mg	493.330	483.746	9.584
Uranium, 2291 GJ per kg	Raw	mg	1.726	1.726	0.000
Vermiculite	Raw	mg	65.639	65.639	0.000
Volume occupied, final repository for low-active radioactive waste	Raw	mm3	520.975	547.456	-26.481
Volume occupied, final repository for radioactive waste	Raw	mm3	57.816	63.312	-5.496
Volume occupied, reservoir	Raw	m3day	73.113	76.040	-2.927
Volume occupied, underground deposit	Raw	cm3	-3.351	-3.353	0.002
Water, cooling, unspecified natural origin, AT	Raw	cu.in	67.451	67.451	0.000
Water, cooling, unspecified natural origin, AU	Raw	cu.in	299.134	299.134	0.000
Water, cooling, unspecified natural origin, BA	Raw	cm3	312.775	312.775	0.000
Water, cooling, unspecified natural origin, BE	Raw	cu.in	196.515	196.515	0.000
Water, cooling, unspecified natural origin, BG	Raw	cu.in	108.858	108.858	0.000
Water, cooling, unspecified natural origin, BR	Raw	cu.in	198.021	198.021	0.000
Water, cooling, unspecified natural origin, CA	Raw	cu.in	823.414	823.414	0.000
Water, cooling, unspecified natural origin, CH	Raw	cu.in	125.019	125.019	0.000
Water, cooling, unspecified natural origin, CL	Raw	cm3	862.000	862.000	0.000
Water, cooling, unspecified natural origin, CN	Raw	dm3	83.459	83.459	0.000
Water, cooling, unspecified natural origin, CY	Raw	cm3	108.529	108.529	0.000
Water, cooling, unspecified natural origin, CZ	Raw	fl. oz	568.597	568.597	0.000
Water, cooling, unspecified natural origin, DE	Raw	fl. oz	786.193	786.193	0.000
Water, cooling, unspecified natural origin, DK	Raw	cm3	896.013	896.013	0.000
Water, cooling, unspecified natural origin, EE	Raw	cm3	506.400	506.400	0.000
Water, cooling, unspecified natural origin, ES	Raw	cu.in	523.948	523.948	0.000
Water, cooling, unspecified natural origin, Europe without Switzerland	Raw	cu.in	119.631	119.631	0.000
Water, cooling, unspecified natural origin, FI	Raw	cu.in	115.484	115.484	0.000
Water, cooling, unspecified natural origin, FR	Raw	fl. oz	778.241	778.241	0.000
Water, cooling, unspecified natural origin, GB	Raw	cu.in	624.072	624.072	0.000
Water, cooling, unspecified natural origin, GLO	Raw	cu.in	265.490	265.490	0.000
Water, cooling, unspecified natural origin, GR	Raw	cu.in	300.394	300.394	0.000
Water, cooling, unspecified natural origin, HR	Raw	cm3	443.746	443.746	0.000
Water, cooling, unspecified natural origin, HU	Raw	cu.in	112.601	112.601	0.000
Water, cooling, unspecified natural origin, ID	Raw	cu.in	253.527	253.527	0.000
Water, cooling, unspecified natural origin, IE	Raw	cm3	759.719	759.719	0.000
Water, cooling, unspecified natural origin, IN	Raw	dm3	29.830	29.830	0.000
Water, cooling, unspecified natural origin, IR	Raw	cu.in	418.243	418.243	0.000
Water, cooling, unspecified natural origin, IS	Raw	mm3	144.071	144.071	0.000
Water, cooling, unspecified natural origin, IT	Raw	cu.in	514.276	514.276	0.000
Water, cooling, unspecified natural origin, JP	Raw	cu.in	899.150	899.150	0.000
Water, cooling, unspecified natural origin, KR	Raw	cu.in	660.753	660.753	0.000
Water, cooling, unspecified natural origin, LT	Raw	cm3	422.026	422.026	0.000
Water, cooling, unspecified natural origin, LU	Raw	cm3	148.949	148.949	0.000
Water, cooling, unspecified natural origin, LV	Raw	cm3	378.867	378.867	0.000
Water, cooling, unspecified natural origin, MA	Raw	cm3	253.924	253.924	0.000
Water, cooling, unspecified natural origin, MK	Raw	cm3	213.347	213.347	0.000
Water, cooling, unspecified natural origin, MT	Raw	cm3	113.287	113.287	0.000
Water, cooling, unspecified natural origin, MX	Raw	cu.in	298.611	298.611	0.000
Water, cooling, unspecified natural origin, MY	Raw	cu.in	631.318	631.318	0.000
Water, cooling, unspecified natural origin, NL	Raw	cu.in	269.966	269.966	0.000
Water, cooling, unspecified natural origin, NO	Raw	cm3	94.969	94.969	0.000

Water, cooling, unspecified natural origin, PE	Raw	cm3	472.024	472.024	0.000
Water, cooling, unspecified natural origin, PH	Raw	mm3	56.581	56.581	0.000
Water, cooling, unspecified natural origin, PL	Raw	fl. oz	793.431	793.431	0.000
Water, cooling, unspecified natural origin, PT	Raw	cu.in	73.943	73.943	0.000
Water, cooling, unspecified natural origin, RER	Raw	dm3	33.216	33.216	0.000
Water, cooling, unspecified natural origin, RNA	Raw	mm3	16.745	16.745	0.000
Water, cooling, unspecified natural origin, RO	Raw	cu.in	187.942	187.942	0.000
Water, cooling, unspecified natural origin, RoW	Raw	dm3	162.506	162.506	0.000
Water, cooling, unspecified natural origin, RS	Raw	cu.in	78.402	78.402	0.000
Water, cooling, unspecified natural origin, RU	Raw	dm3	83.816	83.816	0.000
Water, cooling, unspecified natural origin, SA	Raw	cu.in	511.317	511.317	0.000
Water, cooling, unspecified natural origin, SE	Raw	cu.in	207.064	207.064	0.000
Water, cooling, unspecified natural origin, SI	Raw	cu.in	189.112	189.112	0.000
Water, cooling, unspecified natural origin, SK	Raw	cu.in	190.323	190.323	0.000
Water, cooling, unspecified natural origin, TH	Raw	cu.in	165.526	165.526	0.000
Water, cooling, unspecified natural origin, TR	Raw	cu.in	245.001	245.001	0.000
Water, cooling, unspecified natural origin, TW	Raw	cu.in	252.743	252.743	0.000
Water, cooling, unspecified natural origin, TZ	Raw	cm3	118.323	118.323	0.000
Water, cooling, unspecified natural origin, UA	Raw	cu.in	574.693	574.693	0.000
Water, cooling, unspecified natural origin, US	Raw	ML	1.065	1.065	0.000
Water, cooling, unspecified natural origin, WEU	Raw	mm3	14.060	14.060	0.000
Water, cooling, unspecified natural origin, ZA	Raw	cu.in	323.452	323.452	0.000
Water, cooling, unspecified natural origin/m3	Raw	cu.in	-675.080	-646.626	-28.454
Water, lake	Raw	mm3	637.547	634.438	3.110
Water, lake, AT	Raw	mm3	0.057	0.057	0.000
Water, lake, BE	Raw	mm3	0.118	0.118	0.000
Water, lake, BG	Raw	mm3	0.208	0.208	0.000
Water, lake, CA	Raw	cm3	844.381	844.381	0.000
Water, lake, CH	Raw	cm3	841.054	841.054	0.000
Water, lake, CN	Raw	mm3	4.651	4.651	0.000
Water, lake, CZ	Raw	mm3	0.008	0.008	0.000
Water, lake, DE	Raw	mm3	2.410	2.410	0.000
Water, lake, DK	Raw	mm3	0.095	0.095	0.000
Water, lake, ES	Raw	mm3	0.083	0.083	0.000
Water, lake, Europe without Switzerland	Raw	dm3	101.159	101.159	0.000
Water, lake, FI	Raw	mm3	0.032	0.032	0.000
Water, lake, FR	Raw	mm3	0.253	0.253	0.000
Water, lake, GB	Raw	mm3	0.230	0.230	0.000
Water, lake, GLO	Raw	mm3	5.093	5.093	0.000
Water, lake, HU	Raw	mm3	0.032	0.032	0.000
Water, lake, IT	Raw	mm3	0.246	0.246	0.000
Water, lake, JP	Raw	mm3	0.408	0.408	0.000
Water, lake, KR	Raw	mm3	0.031	0.031	0.000
Water, lake, LU	Raw	mm3	0.005	0.005	0.000
Water, lake, NL	Raw	mm3	0.232	0.232	0.000
Water, lake, NO	Raw	mm3	0.013	0.013	0.000
Water, lake, PL	Raw	mm3	0.005	0.005	0.000
Water, lake, PT	Raw	mm3	0.029	0.029	0.000
Water, lake, RER	Raw	mm3	357.968	357.968	0.000

Water, lake, RNA	Raw	mm3	1.410	1.410	0.000
Water, lake, RoW	Raw	dm3	211.450	211.450	0.000
Water, lake, RU	Raw	mm3	0.158	0.158	0.000
Water, lake, SE	Raw	mm3	0.199	0.199	0.000
Water, lake, SK	Raw	mm3	0.003	0.003	0.000
Water, lake, TR	Raw	mm3	0.006	0.006	0.000
Water, lake, TW	Raw	mm3	0.152	0.152	0.000
Water, lake, US	Raw	cm3	-118.171	-401.459	283.289
Water, process and cooling, unspecified natural origin	Raw	dm3	359.896	359.896	0.000
Water, process, unspecified natural origin/m3	Raw	ML	2.590	2.590	0.000
Water, river	Raw	fl. oz	825.922	826.553	-0.630
Water, river, AT	Raw	mm3	130.089	130.089	0.000
Water, river, AU	Raw	cm3	1.373	1.373	0.000
Water, river, BE	Raw	mm3	271.803	271.803	0.000
Water, river, BG	Raw	mm3	475.783	475.783	0.000
Water, river, BR	Raw	fl. oz	555.203	555.203	0.000
Water, river, CA	Raw	cu.in	469.978	469.978	0.000
Water, river, CH	Raw	cu.in	144.285	144.285	0.000
Water, river, CN	Raw	dm3	218.026	218.026	0.000
Water, river, CZ	Raw	mm3	17.636	17.636	0.000
Water, river, DE	Raw	cm3	909.725	909.725	0.000
Water, river, DK	Raw	mm3	217.339	217.339	0.000
Water, river, ES	Raw	cu.in	513.389	513.389	0.000
Water, river, Europe without Switzerland	Raw	m3	1.552	1.552	0.000
Water, river, FI	Raw	mm3	73.171	73.171	0.000
Water, river, FR	Raw	cu.in	69.522	69.522	0.000
Water, river, GB	Raw	mm3	527.968	527.968	0.000
Water, river, GLO	Raw	cu.in	197.580	197.580	0.000
Water, river, HU	Raw	mm3	74.354	74.354	0.000
Water, river, IN	Raw	dm3	152.199	152.199	0.000
Water, river, IT	Raw	mm3	565.357	565.357	0.000
Water, river, JP	Raw	cm3	1.504	1.504	0.000
Water, river, KR	Raw	cm3	125.322	125.322	0.000
Water, river, LU	Raw	mm3	11.791	11.791	0.000
Water, river, MY	Raw	dm3	567.555	567.555	0.000
Water, river, NL	Raw	mm3	596.000	596.000	0.000
Water, river, NO	Raw	mm3	28.811	28.811	0.000
Water, river, PE	Raw	mm3	8.164	8.164	0.000
Water, river, PH	Raw	fl. oz	866.908	866.908	0.000
Water, river, PL	Raw	mm3	10.418	10.418	0.000
Water, river, PT	Raw	mm3	67.344	67.344	0.000
Water, river, RAS	Raw	cu.in	94.236	94.236	0.000
Water, river, RER	Raw	cu.in	462.153	462.153	0.000
Water, river, RLA	Raw	cm3	703.345	703.345	0.000
Water, river, RNA	Raw	cu.in	89.182	89.182	0.000
Water, river, RO	Raw	cm3	124.102	124.102	0.000
Water, river, RoW	Raw	m3	1.537	1.537	0.000
Water, river, RU	Raw	cm3	45.256	45.256	0.000
Water, river, SE	Raw	mm3	394.527	394.527	0.000

Water, river, SK	Raw	mm3	6.625	6.625	0.000
Water, river, TN	Raw	cm3	631.152	631.152	0.000
Water, river, TR	Raw	mm3	13.929	13.929	0.000
Water, river, TW	Raw	mm3	349.780	349.780	0.000
Water, river, TZ	Raw	mm3	124.787	124.787	0.000
Water, river, US	Raw	dm3	185.150	188.039	-2.888
Water, river, WEU	Raw	mm3	0.002	0.002	0.000
Water, river, ZA	Raw	cm3	3.187	3.187	0.000
Water, salt, ocean	Raw	dm3	36.940	36.704	0.236
Water, salt, sole	Raw	m3	58.831	58.831	0.001
Water, turbine use, unspecified natural origin	Raw	dm3	32.843	33.190	-0.347
Water, turbine use, unspecified natural origin, AT	Raw	m3	1.085	1.085	0.000
Water, turbine use, unspecified natural origin, AU	Raw	dm3	220.013	220.013	0.000
Water, turbine use, unspecified natural origin, BA	Raw	cu.in	571.094	571.094	0.000
Water, turbine use, unspecified natural origin, BE	Raw	fl. oz	561.194	561.194	0.000
Water, turbine use, unspecified natural origin, BG	Raw	dm3	100.012	100.012	0.000
Water, turbine use, unspecified natural origin, BR	Raw	m3	1.629	1.629	0.000
Water, turbine use, unspecified natural origin, CA	Raw	m3	1.314	1.314	0.000
Water, turbine use, unspecified natural origin, CH	Raw	dm3	635.343	635.343	0.000
Water, turbine use, unspecified natural origin, CL	Raw	dm3	350.009	350.009	0.000
Water, turbine use, unspecified natural origin, CN	Raw	m3	16.728	16.728	0.000
Water, turbine use, unspecified natural origin, CZ	Raw	dm3	65.650	65.650	0.000
Water, turbine use, unspecified natural origin, DE	Raw	dm3	571.620	571.620	0.000
Water, turbine use, unspecified natural origin, DK	Raw	cm3	565.077	565.077	0.000
Water, turbine use, unspecified natural origin, EE	Raw	cu.in	92.473	92.473	0.000
Water, turbine use, unspecified natural origin, ES	Raw	dm3	417.611	417.611	0.000
Water, turbine use, unspecified natural origin, FI	Raw	dm3	169.350	169.350	0.000
Water, turbine use, unspecified natural origin, FR	Raw	m3	1.565	1.565	0.000
Water, turbine use, unspecified natural origin, GB	Raw	dm3	148.770	148.770	0.000
Water, turbine use, unspecified natural origin, GLO	Raw	cm3	2.952	2.952	0.000
Water, turbine use, unspecified natural origin, GR	Raw	dm3	113.077	113.077	0.000
Water, turbine use, unspecified natural origin, HR	Raw	cu.in	451.823	451.823	0.000
Water, turbine use, unspecified natural origin, HU	Raw	cu.in	420.158	420.158	0.000
Water, turbine use, unspecified natural origin, ID	Raw	dm3	41.059	41.059	0.000
Water, turbine use, unspecified natural origin, IE	Raw	fl. oz	731.656	731.656	0.000
Water, turbine use, unspecified natural origin, IN	Raw	dm3	390.967	390.967	0.000
Water, turbine use, unspecified natural origin, IR	Raw	dm3	215.215	215.215	0.000
Water, turbine use, unspecified natural origin, IS	Raw	dm3	60.046	60.046	0.000
Water, turbine use, unspecified natural origin, IT	Raw	dm3	398.926	398.926	0.000
Water, turbine use, unspecified natural origin, JP	Raw	m3	1.049	1.049	0.000
Water, turbine use, unspecified natural origin, KR	Raw	dm3	55.954	55.954	0.000
Water, turbine use, unspecified natural origin, LT	Raw	cu.in	716.341	716.341	0.000
Water, turbine use, unspecified natural origin, LU	Raw	cu.in	597.873	597.873	0.000
Water, turbine use, unspecified natural origin, LV	Raw	dm3	95.023	95.023	0.000
Water, turbine use, unspecified natural origin, MK	Raw	cu.in	357.538	357.538	0.000
Water, turbine use, unspecified natural origin, MX	Raw	dm3	570.070	570.070	0.000
Water, turbine use, unspecified natural origin, MY	Raw	dm3	229.206	229.206	0.000
Water, turbine use, unspecified natural origin, NL	Raw	cu.in	187.500	187.500	0.000
Water, turbine use, unspecified natural origin, NO	Raw	dm3	88.670	88.670	0.000

Water, turbine use, unspecified natural origin, PE	Raw	cu.in	411.912	411.912	0.000
Water, turbine use, unspecified natural origin, PL	Raw	dm3	64.635	64.635	0.000
Water, turbine use, unspecified natural origin, PT	Raw	dm3	116.222	116.222	0.000
Water, turbine use, unspecified natural origin, RER	Raw	cm3	175.529	175.529	0.000
Water, turbine use, unspecified natural origin, RNA	Raw	cm3	1.335	1.335	0.000
Water, turbine use, unspecified natural origin, RO	Raw	dm3	332.899	332.899	0.000
Water, turbine use, unspecified natural origin, RoW	Raw	m3	66.279	66.279	0.000
Water, turbine use, unspecified natural origin, RS	Raw	dm3	242.631	242.631	0.000
Water, turbine use, unspecified natural origin, RU	Raw	m3	1.836	1.836	0.000
Water, turbine use, unspecified natural origin, SE	Raw	m3	2.019	2.019	0.000
Water, turbine use, unspecified natural origin, SI	Raw	dm3	140.107	140.107	0.000
Water, turbine use, unspecified natural origin, SK	Raw	dm3	113.424	113.424	0.000
Water, turbine use, unspecified natural origin, TH	Raw	fl. oz	904.751	904.751	0.000
Water, turbine use, unspecified natural origin, TR	Raw	dm3	622.482	622.482	0.000
Water, turbine use, unspecified natural origin, TW	Raw	dm3	95.362	95.362	0.000
Water, turbine use, unspecified natural origin, TZ	Raw	cu.in	353.580	353.580	0.000
Water, turbine use, unspecified natural origin, UA	Raw	dm3	280.826	280.826	0.000
Water, turbine use, unspecified natural origin, US	Raw	m3	120.462	123.946	-3.484
Water, turbine use, unspecified natural origin, ZA	Raw	cu.in	460.237	460.237	0.000
Water, unspecified natural origin, AT	Raw	mm3	487.928	487.928	0.000
Water, unspecified natural origin, AU	Raw	mm3	11.914	11.914	0.000
Water, unspecified natural origin, BE	Raw	mm3	962.422	962.422	0.000
Water, unspecified natural origin, BG	Raw	cm3	1.565	1.565	0.000
Water, unspecified natural origin, BR	Raw	mm3	129.491	129.491	0.000
Water, unspecified natural origin, CA	Raw	cm3	8.660	8.660	0.000
Water, unspecified natural origin, CH	Raw	cm3	48.059	48.059	0.000
Water, unspecified natural origin, CL	Raw	mm3	1.003	1.003	0.000
Water, unspecified natural origin, CN	Raw	cm3	3.789	3.789	0.000
Water, unspecified natural origin, CO	Raw	mm3	1.489	1.489	0.000
Water, unspecified natural origin, CZ	Raw	mm3	151.219	151.219	0.000
Water, unspecified natural origin, DE	Raw	cm3	5.343	5.343	0.000
Water, unspecified natural origin, DK	Raw	mm3	715.843	715.843	0.000
Water, unspecified natural origin, EE	Raw	mm3	18.956	18.956	0.000
Water, unspecified natural origin, ES	Raw	mm3	651.880	651.880	0.000
Water, unspecified natural origin, Europe without Switzerland	Raw	cm3	10.830	10.830	0.000
Water, unspecified natural origin, FI	Raw	mm3	253.887	253.887	0.000
Water, unspecified natural origin, FR	Raw	cm3	1.996	1.996	0.000
Water, unspecified natural origin, GB	Raw	cm3	1.759	1.759	0.000
Water, unspecified natural origin, GLO	Raw	cu.in	695.116	695.116	0.000
Water, unspecified natural origin, HN	Raw	mm3	1.009	1.009	0.000
Water, unspecified natural origin, HU	Raw	mm3	247.626	247.626	0.000
Water, unspecified natural origin, IAI Area, Africa	Raw	mm3	266.490	266.490	0.000
Water, unspecified natural origin, IAI Area, Asia, without China and GCC	Raw	mm3	484.574	484.574	0.000
Water, unspecified natural origin, IAI Area, EU27 & EFTA	Raw	cm3	2.913	2.913	0.000
Water, unspecified natural origin, IAI Area, Gulf Cooperation Council	Raw	mm3	584.749	584.749	0.000
Water, unspecified natural origin, IAI Area, North America, without Quebec	Raw	mm3	368.656	368.656	0.000
Water, unspecified natural origin, IAI Area, Russia & RER w/o EU27 & EFTA	Raw	mm3	870.682	870.682	0.000
Water, unspecified natural origin, IAI Area, South America	Raw	mm3	348.225	348.225	0.000
Water, unspecified natural origin, ID	Raw	mm3	2.427	2.427	0.000

Water, unspecified natural origin, IN	Raw	mm3	59.201	59.201	0.000
Water, unspecified natural origin, IT	Raw	cm3	1.953	1.953	0.000
Water, unspecified natural origin, JP	Raw	cm3	3.806	3.806	0.000
Water, unspecified natural origin, KR	Raw	mm3	593.315	593.315	0.000
Water, unspecified natural origin, LU	Raw	mm3	38.838	38.838	0.000
Water, unspecified natural origin, MX	Raw	mm3	9.343	9.343	0.000
Water, unspecified natural origin, NL	Raw	cm3	1.856	1.856	0.000
Water, unspecified natural origin, NO	Raw	mm3	100.003	100.003	0.000
Water, unspecified natural origin, PG	Raw	mm3	99.440	99.440	0.000
Water, unspecified natural origin, PH	Raw	mm3	14.145	14.145	0.000
Water, unspecified natural origin, PL	Raw	mm3	55.052	55.052	0.000
Water, unspecified natural origin, PT	Raw	mm3	221.807	221.807	0.000
Water, unspecified natural origin, RAF	Raw	cm3	215.418	215.418	0.000
Water, unspecified natural origin, RER	Raw	cu.in	109.635	109.635	0.000
Water, unspecified natural origin, RME	Raw	cu.in	129.265	129.265	0.000
Water, unspecified natural origin, RNA	Raw	cm3	16.331	16.331	0.000
Water, unspecified natural origin, RoW	Raw	cu.in	674.209	674.209	0.000
Water, unspecified natural origin, RU	Raw	cm3	302.674	302.674	0.000
Water, unspecified natural origin, SE	Raw	cm3	1.254	1.254	0.000
Water, unspecified natural origin, SK	Raw	mm3	34.228	34.228	0.000
Water, unspecified natural origin, TH	Raw	mm3	18.093	18.093	0.000
Water, unspecified natural origin, TR	Raw	mm3	75.177	75.177	0.000
Water, unspecified natural origin, TW	Raw	cm3	1.211	1.211	0.000
Water, unspecified natural origin, UA	Raw	mm3	6.426	6.426	0.000
Water, unspecified natural origin, UN-OCEANIA	Raw	mm3	347.909	347.909	0.000
Water, unspecified natural origin, US	Raw	dm3	240.398	26.176	214.222
Water, unspecified natural origin, VN	Raw	mm3	4.641	4.641	0.000
Water, unspecified natural origin, WEU	Raw	mm3	2.212	2.212	0.000
Water, unspecified natural origin/m3	Raw	dm3	48.102	46.570	1.533
Water, well, in ground	Raw	dm3	76.303	76.248	0.055
Water, well, in ground, AT	Raw	mm3	2.261	2.261	0.000
Water, well, in ground, AU	Raw	cm3	189.621	189.621	0.000
Water, well, in ground, BE	Raw	mm3	4.724	4.724	0.000
Water, well, in ground, BG	Raw	mm3	8.272	8.272	0.000
Water, well, in ground, BR	Raw	cu.in	231.633	231.633	0.000
Water, well, in ground, CA	Raw	cm3	891.622	891.622	0.000
Water, well, in ground, CH	Raw	cu.in	114.168	114.168	0.000
Water, well, in ground, CN	Raw	dm3	96.312	96.312	0.000
Water, well, in ground, CZ	Raw	mm3	0.307	0.307	0.000
Water, well, in ground, DE	Raw	cu.in	192.937	192.937	0.000
Water, well, in ground, DK	Raw	mm3	3.778	3.778	0.000
Water, well, in ground, ES	Raw	cu.in	302.933	302.933	0.000
Water, well, in ground, Europe without Switzerland	Raw	dm3	364.460	364.460	0.000
Water, well, in ground, FI	Raw	mm3	1.272	1.272	0.000
Water, well, in ground, FR	Raw	cm3	916.703	916.703	0.000
Water, well, in ground, GB	Raw	mm3	9.176	9.176	0.000
Water, well, in ground, GLO	Raw	cm3	177.674	177.674	0.000
Water, well, in ground, HU	Raw	mm3	1.293	1.293	0.000
Water, well, in ground, ID	Raw	cm3	367.457	367.457	0.000

Water, well, in ground, IN	Raw	dm3	263.056	263.056	0.000
Water, well, in ground, IT	Raw	mm3	9.826	9.826	0.000
Water, well, in ground, JP	Raw	mm3	16.304	16.304	0.000
Water, well, in ground, KR	Raw	mm3	1.242	1.242	0.000
Water, well, in ground, LU	Raw	mm3	0.205	0.205	0.000
Water, well, in ground, MA	Raw	cm3	46.853	46.853	0.000
Water, well, in ground, MY	Raw	dm3	49.353	49.353	0.000
Water, well, in ground, NL	Raw	mm3	9.273	9.273	0.000
Water, well, in ground, NO	Raw	mm3	0.501	0.501	0.000
Water, well, in ground, NORDEL	Raw	mm3	917.079	917.079	0.000
Water, well, in ground, PE	Raw	mm3	13.239	13.239	0.000
Water, well, in ground, PG	Raw	mm3	858.803	858.803	0.000
Water, well, in ground, PH	Raw	cu.in	244.588	244.588	0.000
Water, well, in ground, PL	Raw	cm3	235.767	235.767	0.000
Water, well, in ground, PT	Raw	mm3	1.170	1.170	0.000
Water, well, in ground, RER	Raw	cu.in	78.192	78.192	0.000
Water, well, in ground, RLA	Raw	cm3	35.408	35.408	0.000
Water, well, in ground, RNA	Raw	cm3	232.721	232.721	0.000
Water, well, in ground, RoW	Raw	dm3	764.314	764.314	0.000
Water, well, in ground, RU	Raw	cm3	142.281	142.281	0.000
Water, well, in ground, SE	Raw	mm3	9.820	9.820	0.000
Water, well, in ground, SK	Raw	mm3	0.115	0.115	0.000
Water, well, in ground, TN	Raw	cm3	970.756	970.756	0.000
Water, well, in ground, TR	Raw	mm3	81.997	81.997	0.000
Water, well, in ground, TW	Raw	mm3	6.079	6.079	0.000
Water, well, in ground, US	Raw	dm3	201.431	202.107	-0.676
Water, well, in ground, WEU	Raw	cm3	149.196	149.196	0.000
Water, well, in ground, ZA	Raw	cm3	52.252	52.252	0.000
Wood and wood waste, 20.9 MJ per kg, ovendry basis	Raw	kg	36.174	36.174	0.000
Wood, hard, standing	Raw	cm3	82.832	89.056	-6.224
Wood, primary forest, standing	Raw	cu.in	-101.553	-101.553	0.000
Wood, soft, NE-NC, standing	Raw	dm3	521.912	521.912	0.000
Wood, soft, standing	Raw	cm3	-46.113	-31.239	-14.874
Wood, unspecified, standing/m3	Raw	mm3	55.082	54.920	0.162
Xenon	Raw	µg	2.104	2.104	0.000
Zinc	Raw	g	4.661	4.657	0.005
Zinc, Zn 0.63%, Au 9.7E-4%, Ag 9.7E-4%, Cu 0.38%, Pb 0.014%, in ore	Raw	mg	10.216	10.216	0.000
Zinc, Zn 3.1%, in mixed ore	Raw	mg	6.137	6.137	0.000
Zirconium	Raw	mg	85.378	85.378	0.000
1-Butanol	Air	µg	119.804	119.803	0.001
1-Pentanol	Air	mg	13.678	13.678	0.000
1-Pentene	Air	mg	10.338	10.338	0.000
1-Propanol	Air	mg	97.359	97.359	0.000
1,4-Butanediol	Air	µg	190.438	190.435	0.003
2-Aminopropanol	Air	µg	22.327	22.327	0.001
2-Butene, 2-methyl-	Air	µg	2.304	2.304	0.000
2-Chloroacetophenone	Air	ng	-73.452	-74.039	0.587
2-Methyl-1-propanol	Air	mg	23.588	23.588	0.000
2-Methyl-4-chlorophenoxyacetic acid	Air	ng	1.126	1.126	0.000

2-Nitrobenzoic acid	Air	µg	39.658	39.657	0.001
2-Propanol	Air	µg	309.297	309.307	-0.010
2,4-D	Air	mg	13.038	13.038	0.000
2,4-D amines	Air	pg	557.365	557.365	0.000
2,4-D ester	Air	ng	6.507	6.507	0.000
4-Methyl-2-pentanone	Air	pg	843.196	843.196	0.000
5-methyl Chrysene	Air	ng	190.829	187.008	3.821
Acenaphthene	Air	µg	6.311	6.410	-0.099
Acenaphthylene	Air	µg	2.187	2.143	0.043
Acephate	Air	mg	1.386	1.386	0.000
Acetaldehyde	Air	g	2.842	2.842	0.000
Acetamide	Air	µg	341.163	341.163	0.000
Acetic acid	Air	g	2.513	2.514	-0.001
Acetone	Air	g	1.277	1.277	0.000
Acetonitrile	Air	mg	378.839	378.839	0.000
Acetophenone	Air	ng	-157.396	-158.655	1.258
Acifluorfen	Air	µg	190.249	190.249	0.000
Acrolein	Air	g	3.232	3.232	0.000
Acrylic acid	Air	ng	32.867	32.897	-0.030
Actinides, radioactive, unspecified	Air	Bq	5.482	6.135	-0.653
Aerosols, radioactive, unspecified	Air	mBq	210.217	235.584	-25.367
Alachlor	Air	mg	1.346	1.346	0.000
Aldehydes, unspecified	Air	g	1.716	1.473	0.243
Aluminium	Air	g	9.613	9.706	-0.093
Ammonia	Air	g	55.254	54.579	0.675
Ammonium carbonate	Air	µg	24.315	24.309	0.006
Ammonium chloride	Air	mg	25.870	25.362	0.509
Aniline	Air	µg	932.507	932.479	0.028
Anthracene	Air	µg	1.822	1.785	0.036
Anthranilic acid	Air	µg	31.013	31.012	0.001
Antimony	Air	mg	73.571	73.573	-0.002
Antimony-124	Air	nBq	902.934	904.694	-1.760
Antimony-125	Air	µBq	15.303	15.321	-0.018
Argon-40	Air	g	6.434	6.434	0.000
Argon-41	Air	Bq	2.114	2.115	-0.001
Arsenic	Air	mg	194.479	194.322	0.158
Arsine	Air	pg	0.383	0.383	0.000
Atrazine	Air	mg	1.065	1.065	0.000
Azoxystrobin	Air	µg	629.591	629.591	0.000
Barium	Air	mg	22.856	22.225	0.631
Barium-140	Air	µBq	510.246	511.441	-1.195
Bentazone	Air	µg	583.683	583.683	0.000
Benzal chloride	Air	ng	-8.748	7.100	-15.848
Benzaldehyde	Air	mg	5.459	5.453	0.006
Benzene	Air	g	16.496	16.976	-0.480
Benzene, 1-methyl-2-nitro-	Air	µg	34.246	34.244	0.001
Benzene, 1,2-dichloro-	Air	mg	22.947	22.947	0.000
Benzene, chloro-	Air	ng	-230.848	-232.694	1.846
Benzene, ethyl-	Air	mg	272.956	265.914	7.043

Benzene, hexachloro-	Air	µg	53.859	53.353	0.507
Benzene, pentachloro-	Air	ng	459.179	178.569	280.610
Benzo(a)anthracene	Air	ng	694.270	680.376	13.894
Benzo(a)pyrene	Air	mg	5.563	5.549	0.015
Benzo(b)fluoranthene	Air	pg	417.362	417.362	0.000
Benzo(b,j,k)fluoranthene	Air	ng	954.146	935.041	19.105
Benzo(g,h,i)perylene	Air	ng	234.228	229.538	4.689
Benzo(k)fluoranthene	Air	pg	301.826	301.826	0.000
Benzyl chloride	Air	µg	-7.345	-7.404	0.059
Beryllium	Air	mg	1.908	1.912	-0.004
Biphenyl	Air	µg	14.746	14.451	0.295
Boric acid	Air	pg	17.902	17.902	0.000
Boron	Air	mg	65.077	44.995	20.082
Boron trifluoride	Air	ng	119.958	119.958	0.000
Bromine	Air	mg	26.347	25.240	1.107
Bromoform	Air	ng	-409.231	-412.503	3.272
Bromoxynil	Air	pg	634.156	634.156	0.000
BTEX (Benzene, Toluene, Ethylbenzene, and Xylene), unspecified ratio	Air	mg	860.753	774.276	86.477
Butadiene	Air	mg	10.981	10.979	0.002
Butane	Air	g	1.877	1.861	0.016
Butene	Air	mg	651.003	649.876	1.126
Butyric acid, 4-(2,4-dichlorophenoxy)-	Air	ng	3.878	3.878	0.000
Butyrolactone	Air	µg	3.514	3.514	0.000
Cadmium	Air	mg	63.518	63.439	0.080
Calcium	Air	g	1.496	1.495	0.001
Carbaryl	Air	µg	158.932	158.932	0.000
Carbon	Air	µg	17.437	17.437	0.000
Carbon-14	Air	Bq	76.450	76.954	-0.504
Carbon dioxide	Air	g	-399.019	-399.019	0.000
Carbon dioxide, biogenic	Air	kg	208.665	192.903	15.762
Carbon dioxide, fossil	Air	kg	292.419	273.571	18.848
Carbon dioxide, land transformation	Air	kg	54.562	54.563	0.000
Carbon disulfide	Air	g	4.341	4.341	0.000
Carbon monoxide	Air	g	509.262	490.144	19.118
Carbon monoxide, biogenic	Air	g	7.613	7.097	0.517
Carbon monoxide, fossil	Air	kg	1.327	1.175	0.153
Carbon monoxide, land transformation	Air	g	319.846	319.846	0.000
Carbonyl sulfide	Air	mg	1.169	1.169	0.000
Carfentrazone-ethyl	Air	µg	17.464	17.464	0.000
Cerium-141	Air	µBq	123.671	123.960	-0.290
Cesium-134	Air	µBq	5.923	5.937	-0.014
Cesium-137	Air	µBq	107.317	107.563	-0.246
Chloramine	Air	mg	48.021	48.021	0.000
Chloride	Air	ng	676.531	664.670	11.862
Chlorimuron-ethyl	Air	µg	317.755	317.755	0.000
Chlorinated solvents, unspecified	Air	µg	1.785	1.785	0.000
Chlorine	Air	g	1.243	1.243	0.000
Chloroacetic acid	Air	mg	2.278	2.278	0.000
Chloroform	Air	mg	2.066	1.117	0.949

Chlorosilane, trimethyl-	Air	ng	12.272	12.278	-0.006
Chlorosulfonic acid	Air	µg	82.899	82.898	0.001
Chlorpyrifos	Air	mg	6.339	6.339	0.000
Chromium	Air	mg	499.272	455.902	43.370
Chromium-51	Air	µBq	7.925	7.943	-0.019
Chromium IV	Air	pg	31.200	31.200	0.000
Chromium VI	Air	mg	12.097	11.038	1.059
Chrysene	Air	ng	867.454	850.086	17.368
Clethodim	Air	µg	940.082	940.082	0.000
Cloransulam-methyl	Air	µg	165.496	165.496	0.000
Cobalt	Air	mg	16.991	16.390	0.602
Cobalt-58	Air	µBq	16.264	16.290	-0.026
Cobalt-60	Air	µBq	121.623	121.851	-0.228
Copper	Air	mg	706.558	702.138	4.420
Cumene	Air	mg	60.970	60.772	0.197
Cyanide	Air	g	10.229	10.227	0.002
Cyanoacetic acid	Air	µg	67.761	67.760	0.001
Cyclohexane	Air	µg	1.268	1.268	0.000
Cyfluthrin	Air	µg	33.175	33.175	0.000
Cyhalothrin, gamma-	Air	µg	380.714	380.714	0.000
Cypermethrin	Air	µg	80.502	80.502	0.000
Dibenz(a,h)anthracene	Air	pg	196.142	196.142	0.000
Dicamba	Air	µg	106.560	106.560	0.000
Dichlorprop	Air	pg	798.354	798.354	0.000
Diethyl ether	Air	ng	1.648	1.648	0.000
Diethylamine	Air	µg	422.047	422.034	0.012
Diethylene glycol	Air	ng	1.266	1.266	0.000
Diflubenzuron	Air	µg	17.464	17.464	0.000
Dimethenamid	Air	pg	856.591	856.591	0.000
Dimethyl malonate	Air	µg	84.972	84.971	0.001
Dimethylamine	Air	µg	2.146	2.146	0.000
Dinitrogen monoxide	Air	g	23.554	23.242	0.311
Dioxin, 2,3,7,8 Tetrachlorodibenzo-p-	Air	mg	1.341	1.341	0.000
Dipropylamine	Air	µg	257.037	257.030	0.008
Esfenvalerate	Air	µg	198.402	198.402	0.000
Ethane	Air	g	3.447	3.641	-0.194
Ethane, 1,1-difluoro-, HFC-152a	Air	µg	383.243	383.243	0.000
Ethane, 1,1,1-trichloro-, HCFC-140	Air	µg	56.698	62.452	-5.754
Ethane, 1,1,1,2-tetrafluoro-, HFC-134a	Air	mg	2.784	0.592	2.192
Ethane, 1,1,2-trichloro-1,2,2-trifluoro-, CFC-113	Air	µg	243.790	243.790	0.000
Ethane, 1,2-dibromo-	Air	ng	-12.592	-12.692	0.101
Ethane, 1,2-dichloro-	Air	mg	23.047	22.065	0.982
Ethane, 1,2-dichloro-1,1,2,2-tetrafluoro-, CFC-114	Air	µg	497.833	543.205	-45.372
Ethane, 2-chloro-1,1,1,2-tetrafluoro-, HCFC-124	Air	ng	584.711	584.711	0.000
Ethane, chloro-	Air	mg	12.393	0.000	12.393
Ethane, hexafluoro-, HFC-116	Air	µg	88.408	89.398	-0.990
Ethane, tetrachloro-	Air	mg	6.287	0.000	6.287
Ethanol	Air	mg	91.644	91.632	0.012
Ethene	Air	g	4.505	4.500	0.005

Ethene, chloro-	Air	µg	547.658	401.962	145.696
Ethene, tetrachloro-	Air	µg	633.397	640.125	-6.728
Ethephon	Air	pg	0.040	0.040	0.000
Ethyl acetate	Air	mg	2.587	2.587	0.000
Ethyl cellulose	Air	µg	2.280	2.280	0.000
Ethylamine	Air	mg	12.093	12.093	0.000
Ethylene diamine	Air	mg	11.192	11.192	0.000
Ethylene oxide	Air	mg	6.213	6.212	0.000
Ethyne	Air	mg	-259.607	-260.014	0.407
Fenoxaprop	Air	µg	259.693	259.693	0.000
Fluazifop-p-butyl	Air	µg	372.643	372.643	0.000
Flufenacet	Air	µg	139.721	139.721	0.000
Flumetsulam	Air	µg	32.690	32.690	0.000
Flumiclorac-pentyl	Air	µg	55.937	55.937	0.000
Flumioxazin	Air	µg	565.825	565.825	0.000
Fluoranthene	Air	µg	6.162	6.039	0.123
Fluorene	Air	µg	7.896	7.738	0.158
Fluoride	Air	µg	114.178	99.093	15.085
Fluorine	Air	mg	40.424	41.192	-0.768
Fluosilicic acid	Air	µg	131.928	133.084	-1.157
Fomesafen	Air	mg	2.104	2.104	0.000
Formaldehyde	Air	g	8.741	8.742	-0.001
Formamide	Air	mg	25.017	25.017	0.000
Formic acid	Air	g	2.222	2.222	0.000
Furan	Air	g	14.430	14.430	0.000
Glyphosate	Air	mg	420.585	420.585	0.000
Heat, waste	Air	MJ	489.461	431.123	58.338
Helium	Air	mg	100.997	98.597	2.399
Heptane	Air	mg	474.943	464.483	10.459
Hexane	Air	g	49.352	49.334	0.018
Hydrazine, methyl-	Air	µg	-1.784	-1.798	0.014
Hydrocarbons, aliphatic, alkanes, cyclic	Air	mg	391.575	395.874	-4.300
Hydrocarbons, aliphatic, alkanes, unspecified	Air	g	4.713	4.708	0.005
Hydrocarbons, aliphatic, unsaturated	Air	g	1.375	1.375	0.000
Hydrocarbons, aromatic	Air	g	1.097	1.091	0.006
Hydrocarbons, chlorinated	Air	mg	105.383	105.447	-0.064
Hydrocarbons, unspecified	Air	g	37.122	22.333	14.789
Hydrogen	Air	g	1.138	1.136	0.002
Hydrogen-3, Tritium	Air	kBq	2.049	2.279	-0.230
Hydrogen chloride	Air	g	33.118	32.061	1.057
Hydrogen fluoride	Air	g	2.146	1.895	0.250
Hydrogen peroxide	Air	µg	2.269	2.269	0.000
Hydrogen sulfide	Air	g	1.194	1.642	-0.448
Imazamox	Air	µg	83.676	83.676	0.000
Imazaquin	Air	µg	266.769	266.769	0.000
Imazethapyr	Air	µg	552.103	552.103	0.000
Indeno(1,2,3-cd)pyrene	Air	ng	529.211	518.616	10.595
Iodine	Air	mg	6.054	6.049	0.005
Iodine-129	Air	mBq	18.245	18.529	-0.284

Iodine-131	Air	mBq	694.014	717.431	-23.416
Iodine-133	Air	mBq	773.546	868.484	-94.938
Iodine-135	Air	Bq	1.675	1.881	-0.206
Iron	Air	mg	323.959	335.601	-11.641
Isocyanic acid	Air	µg	955.570	955.571	-0.001
Isophorone	Air	µg	-6.086	-6.135	0.049
Isoprene	Air	g	22.208	21.820	0.389
Isopropylamine	Air	µg	30.980	30.979	0.001
Kerosene	Air	mg	12.390	12.146	0.244
Krypton-85	Air	Bq	6.889	6.893	-0.003
Krypton-85m	Air	Bq	10.558	10.575	-0.017
Krypton-87	Air	Bq	1.678	1.682	-0.004
Krypton-88	Air	Bq	2.200	2.205	-0.005
Krypton-89	Air	mBq	922.455	924.606	-2.151
Lactic acid	Air	µg	201.348	201.342	0.006
Lactofen	Air	µg	268.652	268.652	0.000
Lambda-cyhalothrin	Air	pg	0.001	0.001	0.000
Lanthanum-140	Air	µBq	43.600	43.702	-0.102
Lead	Air	mg	557.233	555.808	1.424
Lead-210	Air	Bq	5.127	5.321	-0.194
Lithium	Air	ng	2.978	2.978	0.000
m-Xylene	Air	mg	49.130	49.158	-0.028
Magnesium	Air	mg	285.002	278.170	6.831
Manganese	Air	g	1.415	1.416	0.000
Manganese-54	Air	µBq	4.058	4.068	-0.010
MCPB	Air	ng	1.096	1.096	0.000
Mercaptans, unspecified	Air	mg	-2.314	-2.331	0.017
Mercury	Air	mg	13.015	12.923	0.092
Metals, unspecified	Air	g	34.424	34.424	0.000
Methane	Air	g	966.384	222.544	743.840
Methane, biogenic	Air	kg	1.009	0.030	0.979
Methane, bromo-, Halon 1001	Air	µg	-1.655	-1.665	0.010
Methane, bromochlorodifluoro-, Halon 1211	Air	µg	-61.555	40.087	-101.642
Methane, bromotrifluoro-, Halon 1301	Air	mg	1.152	1.122	0.030
Methane, chlorodifluoro-, HCFC-22	Air	mg	2.105	2.422	-0.317
Methane, dichloro-, HCC-30	Air	mg	309.990	286.228	23.763
Methane, dichlorodifluoro-, CFC-12	Air	mg	1.380	1.379	0.001
Methane, dichlorofluoro-, HCFC-21	Air	ng	9.768	9.768	0.000
Methane, fossil	Air	g	503.382	583.640	-80.258
Methane, land transformation	Air	g	22.194	22.194	0.000
Methane, monochloro-, R-40	Air	mg	1.397	1.565	-0.167
Methane, tetrachloro-, CFC-10	Air	mg	37.551	37.061	0.490
Methane, tetrafluoro-, CFC-14	Air	µg	831.387	840.294	-8.907
Methane, trichlorofluoro-, CFC-11	Air	ng	15.634	15.634	0.000
Methane, trifluoro-, HFC-23	Air	µg	3.108	3.108	0.000
Methanesulfonic acid	Air	µg	68.474	68.474	0.001
Methanol	Air	g	4.457	4.457	0.000
Methomyl	Air	pg	0.137	0.137	0.000
Methyl acetate	Air	µg	9.183	9.182	0.000

Methyl acrylate	Air	ng	37.291	37.325	-0.034
Methyl borate	Air	mg	5.081	5.081	0.000
Methyl ethyl ketone	Air	mg	2.100	2.119	-0.019
Methyl formate	Air	mg	6.618	6.618	0.000
Methyl lactate	Air	µg	221.046	221.040	0.007
Methyl methacrylate	Air	ng	-209.862	-211.540	1.678
Methylamine	Air	µg	138.986	138.985	0.001
Metolachlor	Air	mg	4.402	4.402	0.000
Metribuzin	Air	mg	1.742	1.742	0.000
Molybdenum	Air	mg	5.612	5.615	-0.003
Monoethanolamine	Air	mg	8.174	8.175	-0.001
Naphtalene	Air	ng	294.558	294.558	0.000
Naphthalene	Air	mg	78.636	78.610	0.025
Nickel	Air	mg	464.363	461.907	2.456
Niobium-95	Air	Bq	2.077	2.077	0.000
Nitrate	Air	mg	3.922	4.099	-0.177
Nitrobenzene	Air	mg	1.276	1.276	0.000
Nitrogen dioxide	Air	g	29.254	11.511	17.743
Nitrogen fluoride	Air	pg	350.355	350.355	0.000
Nitrogen monoxide	Air	g	226.953	129.563	97.389
Nitrogen oxides	Air	kg	1.677	1.517	0.161
Nitrogen, atmospheric	Air	g	4.226	5.815	-1.588
NMVOC, non-methane volatile organic compounds, unspecified origin	Air	kg	1.917	2.735	-0.819
Noble gases, radioactive, unspecified	Air	kBq	181.351	184.799	-3.448
o-Xylene	Air	µg	972.671	972.671	0.000
Organic acids	Air	µg	95.067	93.198	1.869
Organic carbon	Air	µg	43.369	43.369	0.000
Organic substances, unspecified	Air	mg	32.626	31.549	1.076
Ozone	Air	mg	170.567	168.506	2.061
PAH, polycyclic aromatic hydrocarbons	Air	mg	100.796	98.971	1.826
Paraffins	Air	µg	8.151	8.151	0.000
Paraquat	Air	mg	1.121	1.121	0.000
Parathion, methyl	Air	µg	215.110	215.110	0.000
Particulates	Air	g	2.053	0.000	2.053
Particulates, < 10 um	Air	g	16.414	9.459	6.955
Particulates, < 2.5 um	Air	g	88.693	79.235	9.458
Particulates, > 10 um	Air	g	48.545	49.672	-1.128
Particulates, > 2.5 um, and < 10um	Air	g	481.899	480.781	1.118
Particulates, unspecified	Air	g	36.941	34.971	1.970
Pendimethalin	Air	mg	11.809	11.809	0.000
Pentane	Air	g	2.503	2.449	0.054
Pentane, 3-methyl-	Air	µg	22.997	22.997	0.000
Permethrin	Air	µg	175.478	175.478	0.000
Phenanthrene	Air	µg	23.465	22.996	0.469
Phenol	Air	mg	55.936	55.823	0.113
Phenol, 2,4-dichloro-	Air	µg	375.076	375.075	0.002
Phenol, pentachloro-	Air	mg	2.368	2.370	-0.002
Phenols, unspecified	Air	mg	47.734	47.663	0.070
Phosphine	Air	ng	818.047	818.047	0.000

Phosphoric acid	Air	pg	633.762	633.762	0.000
Phosphorus	Air	mg	74.661	74.291	0.370
Phosphorus trichloride	Air	µg	4.314	4.314	0.000
Phthalate, dioctyl-	Air	ng	-765.996	-772.120	6.124
Platinum	Air	ng	2.556	2.556	0.000
Plutonium-238	Air	nBq	2.489	2.528	-0.039
Plutonium-alpha	Air	nBq	5.706	5.794	-0.089
Polonium-210	Air	Bq	7.589	7.771	-0.181
Polychlorinated biphenyls	Air	µg	81.936	81.337	0.599
Potassium	Air	g	5.413	5.415	-0.002
Potassium-40	Air	Bq	3.007	3.269	-0.262
Propanal	Air	mg	65.314	65.308	0.006
Propane	Air	g	1.356	1.378	-0.021
Propene	Air	mg	653.620	650.864	2.756
Propiconazole	Air	µg	206.070	206.070	0.000
Propionic acid	Air	mg	2.480	2.581	-0.101
Propylamine	Air	mg	7.933	7.933	0.000
Propylene oxide	Air	mg	18.342	18.340	0.002
Protactinium-234	Air	mBq	374.720	418.703	-43.983
Prothioconazol	Air	pg	0.004	0.004	0.000
Pyraclostrobin (prop)	Air	µg	485.390	485.390	0.000
Pyrene	Air	µg	2.865	2.807	0.057
Quizalofop ethyl ester	Air	µg	65.138	65.138	0.000
Radioactive species, other beta emitters	Air	Bq	54.892	54.899	-0.007
Radioactive species, unspecified	Air	kBq	493.163	483.324	9.839
Radionuclides (Including Radon)	Air	mg	692.864	679.240	13.623
Radium-226	Air	Bq	3.507	3.711	-0.204
Radium-228	Air	Bq	1.400	1.387	0.013
Radon-220	Air	Bq	60.902	66.574	-5.673
Radon-222	Air	kBq	5392.186	5980.174	-587.988
Ruthenium-103	Air	nBq	105.835	106.082	-0.248
Scandium	Air	µg	511.424	564.260	-52.836
Selenium	Air	mg	39.413	39.619	-0.206
Sethoxydim	Air	µg	140.205	140.205	0.000
Silicon	Air	mg	326.586	293.420	33.167
Silicon tetrachloride	Air	µg	10.798	10.798	0.000
Silicon tetrafluoride	Air	µg	219.779	219.766	0.014
Silver	Air	µg	21.103	23.351	-2.248
Silver-110	Air	µBq	2.047	2.049	-0.002
Sodium	Air	mg	374.298	361.689	12.609
Sodium chlorate	Air	µg	660.565	660.831	-0.266
Sodium dichromate	Air	µg	14.518	14.349	0.169
Sodium formate	Air	µg	4.196	4.139	0.056
Sodium hydroxide	Air	µg	9.558	9.559	0.000
Sodium tetrahydroborate	Air	ng	232.601	232.601	0.000
Strontium	Air	mg	5.651	5.559	0.092
Styrene	Air	mg	1.531	1.539	-0.008
Sulfate	Air	g	1.468	1.485	-0.016
Sulfentrazone	Air	mg	1.341	1.341	0.000

Sulfur dioxide	Air	g	662.325	664.592	-2.267
Sulfur hexafluoride	Air	mg	4.888	4.831	0.057
Sulfur monoxide	Air	g	134.359	117.731	16.628
Sulfur oxides	Air	g	23.804	23.466	0.338
Sulfur trioxide	Air	mg	9.983	9.983	0.000
Sulfuric acid	Air	µg	206.688	206.688	0.000
Sulfuric acid, dimethyl ester	Air	ng	-503.669	-507.696	4.027
t-Butyl methyl ether	Air	mg	337.110	337.100	0.010
t-Butylamine	Air	µg	66.516	66.515	0.001
Tar	Air	ng	760.912	747.571	13.341
Tebuconazole	Air	pg	0.009	0.009	0.000
Tefluthrin	Air	pg	219.465	219.465	0.000
Terpenes	Air	mg	315.699	315.699	0.000
Tetramethyl ammonium hydroxide	Air	µg	8.402	8.402	0.000
Thallium	Air	µg	24.723	23.462	1.260
Thifensulfuron	Air	µg	19.108	19.108	0.000
Thiodicarb	Air	µg	68.098	68.098	0.000
Thorium	Air	µg	27.022	25.532	1.490
Thorium-228	Air	mBq	374.115	394.192	-20.077
Thorium-230	Air	Bq	1.297	1.353	-0.056
Thorium-232	Air	mBq	409.964	431.596	-21.632
Thorium-234	Air	mBq	374.754	418.740	-43.987
Tin	Air	mg	27.686	27.423	0.263
Titanium	Air	mg	16.398	17.080	-0.682
TOC, Total Organic Carbon	Air	g	3.290	3.290	0.000
Toluene	Air	g	6.205	6.903	-0.697
Toluene, 2-chloro-	Air	µg	421.419	421.407	0.013
Toluene, 2,4-dinitro-	Air	ng	-2.938	-2.962	0.023
Trichloroethane	Air	mg	4.764	0.000	4.764
Trifloxystrobin	Air	µg	12.226	12.226	0.000
Trifluralin	Air	mg	19.310	19.310	0.000
Trimethylamine	Air	µg	19.492	19.491	0.001
Tungsten	Air	µg	55.758	61.842	-6.084
Uranium	Air	µg	35.790	33.837	1.953
Uranium-234	Air	Bq	1.939	2.067	-0.129
Uranium-235	Air	mBq	23.125	25.636	-2.511
Uranium-238	Air	Bq	2.539	2.661	-0.122
Uranium alpha	Air	Bq	2.260	2.500	-0.240
Vanadium	Air	mg	53.384	52.567	0.817
Vinyl acetate	Air	ng	-79.748	-80.385	0.638
VOC, volatile organic compounds	Air	g	751.056	735.938	15.118
Water	Air	g	12.487	12.740	-0.253
Water/m3	Air	m3	2.907	2.907	0.000
Xenon-131m	Air	Bq	8.842	8.862	-0.020
Xenon-133	Air	Bq	514.542	515.278	-0.736
Xenon-133m	Air	mBq	350.504	351.196	-0.692
Xenon-135	Air	Bq	181.016	181.310	-0.294
Xenon-135m	Air	Bq	80.538	80.724	-0.186
Xenon-137	Air	Bq	2.523	2.529	-0.006

Xenon-138	Air	Bq	18.861	18.905	-0.044
Xylene	Air	g	7.839	8.260	-0.421
Zinc	Air	mg	511.837	505.988	5.849
Zinc-65	Air	µBq	20.264	20.312	-0.047
Zirconium	Air	µg	2.490	2.020	0.469
Zirconium-95	Air	µBq	38.235	38.281	-0.046
1-Butanol	Water	mg	1.188	1.188	0.000
1-Pentanol	Water	mg	32.828	32.828	0.000
1-Pentene	Water	mg	24.808	24.808	0.000
1-Propanol	Water	mg	44.006	44.006	0.000
1,4-Butanediol	Water	µg	517.845	517.844	0.001
2-Aminopropanol	Water	µg	53.451	53.450	0.002
2-Butene, 2-methyl-	Water	µg	5.529	5.529	0.000
2-Hexanone	Water	mg	1.046	0.900	0.147
2-Methyl-1-propanol	Water	mg	56.610	56.610	0.000
2-Methyl-4-chlorophenoxyacetic acid	Water	ng	2.623	2.623	0.000
2-Propanol	Water	µg	171.530	171.523	0.006
2,4-D amines	Water	ng	3.479	3.479	0.000
2,4-D ester	Water	pg	765.407	765.407	0.000
2,4-DB	Water	ng	1.664	1.664	0.000
4-Methyl-2-pentanol	Water	pg	0.118	0.118	0.000
4-Methyl-2-pentanone	Water	µg	866.038	865.881	0.157
Acenaphthene	Water	µg	11.569	11.241	0.328
Acenaphthylene	Water	ng	700.907	680.420	20.487
Acetaldehyde	Water	mg	287.592	287.592	0.000
Acetic acid	Water	g	1.098	1.098	0.000
Acetone	Water	mg	28.946	28.946	0.000
Acetonitrile	Water	µg	56.740	56.740	0.000
Acetyl chloride	Water	mg	25.789	25.789	0.000
Acidity, unspecified	Water	g	-3.821	-3.816	-0.005
Acids, unspecified	Water	µg	14.211	13.962	0.249
Acrylate	Water	ng	77.787	77.858	-0.071
Actinides, radioactive, unspecified	Water	mBq	29.635	30.096	-0.461
Allyl chloride	Water	µg	5.601	5.601	0.000
Aluminium	Water	g	744.833	155.670	589.163
Ammonia	Water	g	6.653	2.571	4.083
Ammonia, as N	Water	µg	7.137	7.012	0.125
Ammonium, ion	Water	g	87.250	21.294	65.957
Aniline	Water	mg	2.237	2.237	0.000
Anthracene	Water	ng	80.472	80.472	0.000
Antimony	Water	mg	572.939	459.034	113.905
Antimony-122	Water	µBq	591.180	591.890	-0.709
Antimony-124	Water	Bq	1.891	1.891	0.000
Antimony-125	Water	mBq	30.489	30.567	-0.078
AOX, Adsorbable Organic Halogen as Cl	Water	mg	34.164	34.110	0.054
Arsenic	Water	g	1.399	1.374	0.026
Atrazine	Water	ng	29.646	29.646	0.000
Barite	Water	µg	613.251	621.024	-7.773
Barium	Water	g	208.719	181.576	27.143

Barium-140	Water	mBq	1.327	1.330	-0.003
Bentazone	Water	µg	12.060	12.060	0.000
Benzene	Water	g	3.786	3.782	0.004
Benzene, 1-methyl-4-(1-methylethyl)-	Water	µg	16.012	13.770	2.242
Benzene, 1,2-dichloro-	Water	mg	192.343	192.343	0.000
Benzene, chloro-	Water	g	2.251	2.251	0.000
Benzene, ethyl-	Water	mg	62.647	61.370	1.277
Benzene, pentamethyl-	Water	µg	12.009	10.328	1.682
Benzenes, alkylated, unspecified	Water	mg	7.441	6.382	1.059
Benzo(a)anthracene	Water	pg	303.668	303.668	0.000
Benzo(a)pyrene	Water	pg	36.896	36.896	0.000
Benzo(b)fluoranthene	Water	pg	35.985	35.985	0.000
Benzo(g,h,i)perylene	Water	pg	5.064	5.064	0.000
Benzo(k)fluoranthene	Water	pg	16.930	16.930	0.000
Benzoic acid	Water	mg	162.549	139.785	22.764
Beryllium	Water	mg	182.048	183.271	-1.224
Biphenyl	Water	µg	481.777	413.192	68.585
BOD5, Biological Oxygen Demand	Water	kg	3.170	2.258	0.912
Borate	Water	g	2.495	2.495	0.000
Boron	Water	g	35.619	35.316	0.302
Bromate	Water	mg	260.709	260.381	0.328
Bromide	Water	g	147.162	142.354	4.808
Bromine	Water	g	11.839	15.976	-4.137
Bromoxynil	Water	ng	3.886	3.886	0.000
Butene	Water	g	1.457	1.457	0.000
Butyl acetate	Water	mg	1.180	1.180	0.000
Butyrolactone	Water	µg	8.433	8.433	0.000
Cadmium	Water	g	1.375	0.821	0.554
Calcium	Water	kg	3.031	2.373	0.658
Carbaryl	Water	pg	3.477	3.477	0.000
Carbon	Water	µg	59.669	59.669	0.000
Carbon-14	Water	mBq	207.662	207.662	0.000
Carbon disulfide	Water	mg	68.045	68.045	0.000
Carbonate	Water	mg	861.607	860.798	0.810
Carboxylic acids, unspecified	Water	g	7.622	7.397	0.225
Cerium-141	Water	µBq	586.746	587.988	-1.243
Cerium-144	Water	µBq	315.209	315.587	-0.378
Cesium	Water	mg	1.799	1.746	0.053
Cesium-134	Water	mBq	17.390	17.441	-0.052
Cesium-136	Water	µBq	183.763	183.983	-0.221
Cesium-137	Water	Bq	3.599	3.652	-0.053
Chloramine	Water	mg	428.495	428.495	0.000
Chlorate	Water	g	2.008	2.006	0.003
Chloride	Water	kg	11.160	10.816	0.344
Chlorides, unspecified	Water	mg	81.020	81.020	0.000
Chlorinated solvents, unspecified	Water	mg	42.953	42.949	0.004
Chlorine	Water	mg	1.365	1.226	0.139
Chloroacetic acid	Water	mg	103.677	103.677	0.000
Chloroacetyl chloride	Water	µg	71.286	71.284	0.002

Chloroform	Water	µg	245.625	45.605	200.020
Chlorosulfonic acid	Water	µg	206.332	206.330	0.002
Chromium	Water	mg	413.362	373.376	39.987
Chromium-51	Water	mBq	100.612	100.856	-0.244
Chromium III	Water	mg	20.330	16.459	3.871
Chromium VI	Water	g	1.484	1.405	0.079
Chrysene	Water	pg	195.866	195.866	0.000
Cobalt	Water	g	2.914	2.825	0.089
Cobalt-57	Water	mBq	5.833	5.840	-0.007
Cobalt-58	Water	mBq	787.207	788.471	-1.263
Cobalt-60	Water	mBq	525.888	526.955	-1.067
COD, Chemical Oxygen Demand	Water	kg	5.112	1.325	3.787
Copper	Water	g	64.976	7.483	57.494
Cu-HDO	Water	pg	32.543	32.543	0.000
Cumene	Water	mg	146.475	145.996	0.478
Cyanide	Water	mg	274.199	274.029	0.169
Decane	Water	mg	4.671	4.017	0.654
Detergent, oil	Water	mg	135.253	116.383	18.869
Dibenz(a,h)anthracene	Water	pg	3.545	3.545	0.000
Dibenzofuran	Water	µg	30.468	26.201	4.267
Dibenzothiophene	Water	µg	26.173	22.504	3.669
Dicamba	Water	ng	3.142	3.142	0.000
Dichlorprop	Water	pg	835.270	835.270	0.000
Dichromate	Water	µg	6.163	5.548	0.615
Diethylamine	Water	mg	1.013	1.013	0.000
Dimethenamid	Water	pg	306.108	306.108	0.000
Dimethylamine	Water	mg	1.231	1.231	0.000
Dipropylamine	Water	µg	616.894	616.876	0.018
DOC, Dissolved Organic Carbon	Water	kg	3.803	0.400	3.403
Docosane	Water	µg	171.465	147.453	24.013
Dodecane	Water	mg	8.862	7.621	1.241
Eicosane	Water	mg	2.440	2.098	0.342
Ethane, 1,1,1-trichloro-, HCFC-140	Water	pg	0.299	0.299	0.000
Ethane, 1,2-dichloro-	Water	mg	50.716	50.696	0.020
Ethane, tetrachloro-	Water	µg	5.634	0.000	5.634
Ethanol	Water	mg	115.050	115.050	0.000
Ethene	Water	mg	329.468	329.439	0.029
Ethene, chloro-	Water	µg	362.336	351.073	11.263
Ethephon	Water	pg	0.003	0.003	0.000
Ethyl acetate	Water	mg	1.055	1.055	0.000
Ethylamine	Water	mg	29.023	29.023	0.000
Ethylene diamine	Water	mg	26.860	26.860	0.000
Ethylene oxide	Water	mg	14.816	14.816	0.000
Fluoranthene	Water	µg	1.594	1.594	0.000
Fluorene	Water	ng	587.598	587.598	0.000
Fluorene, 1-methyl-	Water	µg	18.236	15.683	2.554
Fluorenes, alkylated, unspecified	Water	µg	431.228	369.838	61.389
Fluoride	Water	g	67.388	65.001	2.386
Fluorine	Water	µg	213.045	182.748	30.297

Fluosilicic acid	Water	µg	244.942	247.024	-2.082
Formaldehyde	Water	mg	48.737	48.714	0.023
Formamide	Water	mg	60.042	60.042	0.000
Formate	Water	mg	20.501	20.501	0.000
Formic acid	Water	mg	17.429	17.429	0.000
Glutaraldehyde	Water	ng	75.710	76.669	-0.960
Glyphosate	Water	µg	294.070	294.070	0.000
Heat, waste	Water	MJ	602.447	78.178	524.269
Hexadecane	Water	mg	9.673	8.318	1.355
Hexanoic acid	Water	mg	33.662	28.948	4.714
Hydrocarbons, aliphatic, alkanes, unspecified	Water	mg	233.888	227.041	6.847
Hydrocarbons, aliphatic, unsaturated	Water	mg	21.966	21.334	0.632
Hydrocarbons, aromatic	Water	mg	950.234	922.433	27.800
Hydrocarbons, unspecified	Water	mg	161.394	161.030	0.364
Hydrogen-3, Tritium	Water	kBq	28.341	29.669	-1.328
Hydrogen carbonate	Water	g	3.416	3.416	0.000
Hydrogen chloride	Water	mg	7.823	7.823	0.000
Hydrogen peroxide	Water	mg	1.575	1.574	0.001
Hydrogen sulfide	Water	g	3.827	0.273	3.554
Hydroxide	Water	mg	66.561	66.561	0.000
Hypochlorite	Water	mg	3.892	3.924	-0.032
Indeno(1,2,3-cd)pyrene	Water	pg	55.647	55.647	0.000
Iodide	Water	g	10.247	10.242	0.006
Iodine-131	Water	mBq	369.516	369.533	-0.017
Iodine-133	Water	µBq	965.810	967.761	-1.951
Iron	Water	g	454.010	350.711	103.300
Iron-59	Water	Bq	1.694	1.694	0.000
Isopropylamine	Water	µg	74.353	74.351	0.003
Lactic acid	Water	µg	483.239	483.224	0.014
Lambda-cyhalothrin	Water	pg	0.000	0.000	0.000
Lanthanum-140	Water	mBq	1.571	1.575	-0.003
Lead	Water	g	24.960	1.104	23.856
Lead-210	Water	Bq	-36.482	-29.720	-6.762
Lead-210/kg	Water	pg	16.649	14.318	2.332
Lithium	Water	g	62.577	85.499	-22.923
m-Xylene	Water	mg	54.740	54.741	0.000
Magnesium	Water	kg	1.291	1.137	0.154
Manganese	Water	g	115.425	103.958	11.467
Manganese-54	Water	mBq	29.718	29.793	-0.075
MCPB	Water	ng	2.538	2.538	0.000
Mercury	Water	mg	75.355	7.070	68.285
Metallic ions, unspecified	Water	ng	666.627	654.939	11.688
Metals (unspecified)	Water	µg	211.287	0.000	211.287
Methane, dichloro-, HCC-30	Water	mg	56.192	56.187	0.006
Methane, monochloro-, R-40	Water	µg	6.450	5.546	0.903
Methane, tetrachloro-, CFC-10	Water	µg	104.235	0.000	104.235
Methanol	Water	mg	195.670	195.670	0.000
Methomyl	Water	pg	0.002	0.002	0.000
Methyl acetate	Water	µg	22.039	22.038	0.001

Methyl acrylate	Water	ng	728.491	729.158	-0.667
Methyl ethyl ketone	Water	µg	12.899	11.092	1.806
Methyl formate	Water	mg	2.642	2.642	0.000
Methylamine	Water	µg	333.555	333.554	0.001
Metolachlor	Water	µg	1.765	1.765	0.000
Molybdenum	Water	mg	887.813	854.794	33.019
Molybdenum-99	Water	µBq	489.283	490.424	-1.141
Monoethanolamine	Water	ng	117.154	117.154	0.000
n-Hexacosane	Water	µg	106.973	91.992	14.981
Naphthalene	Water	mg	2.919	2.511	0.409
Naphthalene, 2-methyl-	Water	mg	2.538	2.183	0.355
Naphthalenes, alkylated, unspecified	Water	µg	121.933	104.574	17.358
Nickel	Water	g	9.468	4.290	5.178
Niobium-95	Water	mBq	2.753	2.757	-0.005
Nitrate	Water	kg	1.368	1.233	0.135
Nitrate compounds	Water	ng	192.589	189.212	3.377
Nitric acid	Water	µg	431.985	424.411	7.574
Nitrite	Water	g	2.747	0.352	2.395
Nitrobenzene	Water	mg	5.114	5.113	0.000
Nitrogen	Water	g	-2.184	-3.170	0.985
Nitrogen, organic bound	Water	g	52.208	3.264	48.944
Nitrogen, total	Water	mg	13.770	13.499	0.271
o-Cresol	Water	mg	4.610	3.964	0.646
o-Xylene	Water	mg	1.014	1.509	-0.496
Octadecane	Water	mg	2.390	2.055	0.335
Oils, biogenic	Water	g	1.015	1.015	0.000
Oils, unspecified	Water	g	113.451	109.906	3.545
Organic carbon	Water	µg	141.121	141.121	0.000
p-Cresol	Water	mg	4.973	4.277	0.696
PAH, polycyclic aromatic hydrocarbons	Water	mg	13.847	13.540	0.308
Paraffins	Water	µg	23.655	23.655	0.000
Pendimethalin	Water	pg	416.749	416.749	0.000
Phenanthrene	Water	µg	45.296	39.069	6.227
Phenanthrenes, alkylated, unspecified	Water	µg	50.558	43.361	7.197
Phenol	Water	mg	353.745	349.076	4.668
Phenol, 2,4-dimethyl-	Water	mg	4.488	3.860	0.629
Phenols, unspecified	Water	mg	14.287	12.454	1.832
Phosphate	Water	g	210.931	211.610	-0.678
Phosphorus	Water	g	1.690	1.689	0.001
Polonium-210	Water	Bq	-77.219	-76.958	-0.260
Polychlorinated biphenyls	Water	pg	867.750	867.750	0.000
Potassium	Water	g	677.448	584.845	92.602
Potassium-40	Water	Bq	-3.314	-2.976	-0.338
Propanal	Water	mg	47.510	47.510	0.000
Propene	Water	mg	97.885	97.706	0.179
Propiconazole	Water	pg	3.994	3.994	0.000
Propionic acid	Water	mg	1.012	1.012	0.000
Propylamine	Water	mg	19.039	19.039	0.000
Propylene oxide	Water	mg	43.908	43.904	0.004

Protactinium-234	Water	mBq	797.676	879.719	-82.043
Prothioconazol	Water	pg	0.000	0.000	0.000
Pyraclostrobin (prop)	Water	pg	179.831	179.831	0.000
Pyrene	Water	µg	1.201	1.201	0.000
Radioactive species, alpha emitters	Water	mBq	431.597	431.581	0.016
Radioactive species, Nuclides, unspecified	Water	Bq	850.597	838.627	11.970
Radium-224	Water	Bq	89.957	87.323	2.633
Radium-226	Water	Bq	605.956	682.664	-76.709
Radium-226/kg	Water	ng	5.792	4.981	0.811
Radium-228	Water	Bq	265.510	302.081	-36.570
Radium-228/kg	Water	pg	29.629	25.480	4.149
Rubidium	Water	mg	17.991	17.465	0.527
Ruthenium-103	Water	µBq	193.700	193.941	-0.241
Scandium	Water	mg	315.867	319.100	-3.233
Selenium	Water	mg	638.188	636.207	1.981
Silicon	Water	g	832.910	766.638	66.272
Silicon dioxide	Water	µg	91.646	91.646	0.000
Silver	Water	mg	514.768	480.728	34.040
Silver-110	Water	mBq	369.432	370.501	-1.070
Sodium	Water	kg	4.533	4.281	0.252
Sodium-24	Water	mBq	6.869	6.878	-0.009
Sodium chlorate	Water	µg	441.503	441.503	0.000
Sodium formate	Water	µg	10.080	9.944	0.135
Solids, inorganic	Water	g	7.910	7.942	-0.032
Strontium	Water	g	30.960	31.121	-0.161
Strontium-89	Water	mBq	9.408	9.428	-0.020
Strontium-90	Water	Bq	13.585	13.592	-0.007
Sulfate	Water	kg	6.517	6.423	0.095
Sulfide	Water	mg	320.311	319.152	1.158
Sulfite	Water	mg	14.970	15.624	-0.654
Sulfur	Water	g	8.959	8.951	0.008
Suspended solids, unspecified	Water	kg	17.339	17.278	0.061
t-Butyl methyl ether	Water	mg	10.039	9.929	0.110
t-Butylamine	Water	µg	159.639	159.636	0.003
Tar	Water	ng	10.885	10.694	0.191
Tebuconazole	Water	pg	0.003	0.003	0.000
Technetium-99m	Water	mBq	12.095	12.121	-0.026
Tefluthrin	Water	pg	0.001	0.001	0.000
Tellurium-123m	Water	mBq	1.444	1.451	-0.008
Tellurium-132	Water	µBq	55.063	55.130	-0.066
Tetradecane	Water	mg	3.884	3.340	0.544
Thallium	Water	mg	77.067	76.977	0.090
Thorium-228	Water	Bq	359.187	348.654	10.533
Thorium-230	Water	Bq	102.149	113.343	-11.194
Thorium-232	Water	mBq	557.590	620.748	-63.158
Thorium-234	Water	mBq	798.035	880.116	-82.081
Tin	Water	g	4.291	0.801	3.490
Titanium	Water	g	2.184	2.254	-0.071
TOC, Total Organic Carbon	Water	kg	3.818	0.414	3.404

Toluene	Water	mg	660.766	654.130	6.636
Toluene, 2-chloro-	Water	µg	833.662	833.637	0.025
Tributyltin compounds	Water	mg	2.235	2.182	0.053
Trichloroethane	Water	µg	5.634	0.000	5.634
Triethylene glycol	Water	µg	176.258	177.161	-0.903
Trifloxystrobin	Water	pg	0.000	0.000	0.000
Trimethylamine	Water	µg	46.781	46.779	0.002
Tungsten	Water	g	1.087	1.088	-0.001
Uranium-234	Water	Bq	0.952	1.050	-0.098
Uranium-235	Water	Bq	1.490	1.653	-0.162
Uranium-238	Water	Bq	-23.275	-22.898	-0.377
Uranium alpha	Water	Bq	43.538	48.262	-4.724
Urea	Water	mg	54.603	54.603	0.000
Vanadium	Water	mg	898.717	778.228	120.490
VOC, volatile organic compounds, unspecified origin	Water	mg	631.642	613.412	18.230
Water, AR	Water	mm3	333.914	333.914	0.000
Water, AT	Water	m3	1.086	1.086	0.000
Water, AU	Water	dm3	225.126	225.126	0.000
Water, BA	Water	cu.in	590.244	590.244	0.000
Water, BE	Water	fl. oz	666.536	666.536	0.000
Water, BG	Water	dm3	101.795	101.795	0.000
Water, BR	Water	m3	1.626	1.626	0.000
Water, CA	Water	m3	1.324	1.324	0.000
Water, CH	Water	dm3	637.953	637.953	0.000
Water, CI	Water	mm3	826.264	826.264	0.000
Water, CL	Water	dm3	350.880	350.880	0.000
Water, CN	Water	m3	16.817	16.817	0.000
Water, CO	Water	cu.in	312.525	312.525	0.000
Water, CR	Water	mm3	9.784	9.784	0.000
Water, CY	Water	cm3	107.860	107.860	0.000
Water, CZ	Water	dm3	81.954	81.954	0.000
Water, DE	Water	dm3	594.260	594.260	0.000
Water, DK	Water	cu.in	70.596	70.596	0.000
Water, EC	Water	mm3	110.889	110.889	0.000
Water, EE	Water	cu.in	123.536	123.536	0.000
Water, ES	Water	dm3	426.069	426.069	0.000
Water, Europe without Switzerland	Water	dm3	255.413	255.413	0.000
Water, FI	Water	dm3	170.898	170.898	0.000
Water, FR	Water	m3	1.588	1.588	0.000
Water, GB	Water	dm3	159.026	159.026	0.000
Water, GH	Water	mm3	802.972	802.972	0.000
Water, GLO	Water	m3	1.867	1.867	0.000
Water, GR	Water	dm3	117.884	117.884	0.000
Water, HN	Water	mm3	1.009	1.009	0.000
Water, HR	Water	cu.in	471.609	471.609	0.000
Water, HU	Water	cu.in	533.431	533.431	0.000
Water, IAI Area, Africa	Water	mm3	354.068	354.068	0.000
Water, IAI Area, Asia, without China and GCC	Water	mm3	641.682	641.682	0.000
Water, IAI Area, EU27 & EFTA	Water	cm3	8.383	8.383	0.000

Water, IAI Area, Gulf Cooperation Council	Water	mm3	776.916	776.916	0.000
Water, IAI Area, North America, without Quebec	Water	mm3	476.247	476.247	0.000
Water, IAI Area, Russia & RER w/o EU27 & EFTA	Water	cm3	1.220	1.220	0.000
Water, IAI Area, South America	Water	mm3	436.357	436.357	0.000
Water, ID	Water	dm3	67.755	67.755	0.000
Water, IE	Water	fl. oz	757.642	757.642	0.000
Water, IL	Water	mm3	21.250	21.250	0.000
Water, IN	Water	dm3	419.269	419.269	0.000
Water, IR	Water	dm3	222.138	222.138	0.000
Water, IS	Water	dm3	59.830	59.830	0.000
Water, IT	Water	dm3	406.400	406.400	0.000
Water, JP	Water	m3	1.063	1.063	0.000
Water, KR	Water	dm3	66.401	66.401	0.000
Water, LT	Water	cu.in	741.076	741.076	0.000
Water, LU	Water	cu.in	607.095	607.095	0.000
Water, LV	Water	dm3	95.408	95.408	0.000
Water, MA	Water	cm3	186.452	186.452	0.000
Water, MK	Water	cu.in	369.753	369.753	0.000
Water, MT	Water	cm3	112.904	112.904	0.000
Water, MX	Water	dm3	575.014	575.014	0.000
Water, MY	Water	dm3	686.432	686.432	0.000
Water, NL	Water	cu.in	444.943	444.943	0.000
Water, NO	Water	dm3	85.951	85.951	0.000
Water, NORDEL	Water	mm3	779.517	779.517	0.000
Water, NZ	Water	mm3	0.077	0.077	0.000
Water, PE	Water	cu.in	426.316	426.316	0.000
Water, PG	Water	mm3	814.507	814.507	0.000
Water, PH	Water	cm3	3.220	3.220	0.000
Water, PL	Water	dm3	85.161	85.161	0.000
Water, PT	Water	dm3	117.385	117.385	0.000
Water, RAF	Water	cm3	183.106	183.106	0.000
Water, RAS	Water	cm3	772.025	772.025	0.000
Water, RER	Water	fl. oz	771.780	771.780	0.000
Water, RLA	Water	cm3	386.333	386.333	0.000
Water, RME	Water	cu.in	109.876	109.876	0.000
Water, RNA	Water	cu.in	65.521	65.521	0.000
Water, RO	Water	dm3	335.831	335.831	0.000
Water, RoW	Water	m3	67.185	67.185	0.000
Water, RS	Water	dm3	243.885	243.885	0.000
Water, RU	Water	m3	1.916	1.916	0.000
Water, SA	Water	cu.in	514.437	514.437	0.000
Water, SE	Water	m3	2.022	2.022	0.000
Water, SI	Water	dm3	143.145	143.145	0.000
Water, SK	Water	dm3	116.365	116.365	0.000
Water, TH	Water	fl. oz	994.747	994.747	0.000
Water, TR	Water	dm3	626.204	626.204	0.000
Water, TW	Water	dm3	99.483	99.483	0.000
Water, TZ	Water	cu.in	359.597	359.597	0.000
Water, UA	Water	dm3	290.308	290.308	0.000

Water, UCTE	Water	mm3	2.632	2.632	0.000
Water, UCTE without Germany	Water	mm3	1.459	1.459	0.000
Water, UN-OCEANIA	Water	mm3	462.243	462.243	0.000
Water, US	Water	m3	4.615	4.615	0.000
Water, VN	Water	mm3	77.657	77.657	0.000
Water, WEU	Water	cm3	165.835	165.835	0.000
Water, ZA	Water	cu.in	790.627	790.627	0.000
Xylene	Water	mg	356.247	349.742	6.505
Yttrium	Water	mg	1.080	0.929	0.151
Zinc	Water	g	96.134	44.833	51.301
Zinc-65	Water	mBq	183.125	183.242	-0.117
Zirconium-95	Water	mBq	847.727	847.728	-0.001
Waste in inert landfill	Waste	g	229.859	229.859	0.000
2-Methyl-4-chlorophenoxyacetic acid	Soil	µg	1.050	1.050	0.000
2,4-D	Soil	g	1.147	1.147	0.000
2,4-D amines	Soil	ng	111.169	111.169	0.000
2,4-D ester	Soil	ng	29.894	29.894	0.000
Abamectin	Soil	ng	9.159	9.159	0.000
Acephate	Soil	mg	20.582	20.582	0.000
Acetamide	Soil	mg	2.886	2.886	0.000
Acetamiprid	Soil	ng	436.905	436.905	0.000
Acetochlor	Soil	µg	7.633	7.633	0.000
Acifluorfen	Soil	µg	8.155	8.155	0.000
Aclonifen	Soil	mg	-24.768	-24.768	0.000
Alachlor	Soil	µg	59.087	59.087	0.000
Aldicarb	Soil	mg	69.059	69.058	0.000
Aldrin	Soil	µg	464.404	464.404	0.000
Alpha-cypermethrin	Soil	ng	5.994	5.994	0.000
Aluminium	Soil	g	1.079	1.080	-0.001
Ametryn	Soil	ng	123.142	123.142	0.000
Amidosulfuron	Soil	pg	371.598	371.598	0.000
Anthraquinone	Soil	ng	114.486	114.486	0.000
Antimony	Soil	µg	6.041	6.041	0.000
Arsenic	Soil	µg	383.314	383.520	-0.205
Asulam	Soil	ng	21.008	21.008	0.000
Atrazine	Soil	µg	255.936	255.936	0.000
Azinphos-methyl	Soil	ng	796.801	769.970	26.831
Azoxystrobin	Soil	mg	1.342	1.341	0.000
Barium	Soil	µg	381.949	381.544	0.405
Benfluralin	Soil	ng	834.378	834.378	0.000
Benomyl	Soil	mg	2.156	2.156	0.000
Bensulfuron methyl ester	Soil	ng	1.849	1.849	0.000
Bentazone	Soil	mg	-12.290	-12.290	0.000
Benzene, pentachloronitro-	Soil	µg	8.213	7.937	0.277
Bifenox	Soil	ng	33.182	33.182	0.000
Bifenthrin	Soil	ng	27.814	27.814	0.000
Bitertanol	Soil	ng	11.489	11.489	0.000
Boron	Soil	µg	8.291	8.116	0.176
Boscalid	Soil	ng	255.394	255.394	0.000

Bromacil	Soil	ng	246.284	246.284	0.000
Bromine	Soil	µg	51.538	51.538	0.000
Bromoxynil	Soil	ng	300.662	300.662	0.000
Bromuconazole	Soil	pg	423.518	423.518	0.000
Buprofezin	Soil	ng	8.175	8.175	0.000
Butyric acid, 4-(2,4-dichlorophenoxy)-	Soil	ng	61.987	61.987	0.000
Cadmium	Soil	mg	2.997	2.997	0.000
Calcium	Soil	g	14.337	14.345	-0.009
Captan	Soil	µg	23.001	23.001	0.000
Carbaryl	Soil	µg	6.474	6.470	0.004
Carbendazim	Soil	mg	8.903	8.903	0.000
Carbetamide	Soil	mg	-2.473	-2.473	0.000
Carbofuran	Soil	g	1.182	1.182	0.000
Carbon	Soil	g	192.473	192.473	0.000
Carbon dioxide, to soil or biomass stock	Soil	g	442.361	442.361	0.000
Carfentrazone-ethyl	Soil	ng	749.693	749.693	0.000
Chlorfenvinphos	Soil	ng	51.958	51.958	0.000
Chloridazon	Soil	ng	37.797	37.797	0.000
Chloride	Soil	mg	160.894	161.001	-0.107
Chlorimuron-ethyl	Soil	µg	-549.776	-549.776	0.000
Chlorine	Soil	mg	1.341	1.341	0.000
Chlormequat	Soil	µg	40.322	40.322	0.000
Chloropicrin	Soil	µg	6.228	6.228	0.000
Chlorothalonil	Soil	µg	174.424	170.431	3.993
Chlorpyrifos	Soil	mg	51.744	51.744	0.000
Chlorpyrifos methyl	Soil	mg	278.626	278.626	0.000
Chlorsulfuron	Soil	pg	583.849	583.849	0.000
Chlortoluron	Soil	ng	495.927	495.927	0.000
Choline chloride	Soil	ng	80.490	80.490	0.000
Chromium	Soil	mg	19.924	19.926	-0.002
Chromium VI	Soil	µg	1.453	1.467	-0.014
Cinidon-ethyl	Soil	pg	450.425	450.425	0.000
Clethodim	Soil	µg	-758.828	-758.828	0.001
Clodinafop-propargyl	Soil	ng	8.640	8.640	0.000
Clomazone	Soil	µg	47.940	47.940	0.000
Clopyralid	Soil	ng	-990.479	-990.502	0.023
Cloquintocet-mexyl	Soil	ng	2.087	2.087	0.000
Cloransulam-methyl	Soil	µg	-234.769	-234.770	0.000
Cobalt	Soil	µg	954.565	955.115	-0.550
Copper	Soil	g	969.741	244.271	725.469
Cycloxydim	Soil	ng	33.593	33.593	0.000
Cyfluthrin	Soil	µg	172.193	172.175	0.018
Cyhalothrin, gamma-	Soil	µg	16.321	16.321	0.000
Cymoxanil	Soil	ng	490.650	478.266	12.383
Cypermethrin	Soil	mg	239.995	239.995	0.000
Cyproconazole	Soil	µg	2.253	2.253	0.000
Cyprodinil	Soil	µg	148.596	148.596	0.000
Deltamethrin	Soil	µg	2.058	2.058	0.000
Desmedipham	Soil	ng	16.313	16.313	0.000

Diazinon	Soil	µg	3.505	3.404	0.102
Dicamba	Soil	µg	4.962	4.962	0.000
Dichlorprop	Soil	ng	33.148	33.148	0.000
Dichlorprop-P	Soil	µg	203.910	197.044	6.866
Diclofop	Soil	ng	180.119	180.119	0.000
Diclofop-methyl	Soil	ng	182.957	182.957	0.000
Dicrotophos	Soil	mg	3.768	3.768	0.000
Difenoconazole	Soil	mg	4.312	4.312	0.000
Diflubenzuron	Soil	mg	471.107	471.107	0.000
Diflufenican	Soil	ng	396.416	396.416	0.000
Diflufenzopyr-sodium	Soil	ng	24.723	24.723	0.000
Dimethachlor	Soil	µg	117.000	117.000	0.000
Dimethenamid	Soil	ng	985.261	985.261	0.000
Dimethoate	Soil	µg	4.140	4.069	0.070
Dimethomorph	Soil	ng	157.083	154.429	2.654
Dipropylthiocarbamic acid S-ethyl ester	Soil	µg	32.652	31.553	1.100
Diquat	Soil	µg	409.311	409.099	0.212
Dithianone	Soil	ng	3.716	3.716	0.000
Diuron	Soil	mg	5.849	5.849	0.000
Endosulfan	Soil	mg	142.783	142.783	0.000
Endothall	Soil	µg	-1.049	-1.049	0.001
Epoxiconazole	Soil	ng	43.834	43.834	0.000
Esfenvalerate	Soil	µg	8.949	8.934	0.015
Ethalfluralin	Soil	µg	-34.897	-34.898	0.001
Ethephon	Soil	mg	7.846	7.846	0.000
Ethofumesate	Soil	µg	32.001	32.001	0.000
Ethoprop	Soil	µg	7.565	7.310	0.255
Fenamiphos	Soil	ng	680.680	680.680	0.000
Fenbuconazole	Soil	ng	2.980	2.980	0.000
Fenoxaprop	Soil	µg	-471.644	-471.644	0.000
Fenoxaprop-P ethyl ester	Soil	ng	13.276	13.276	0.000
Fenoxaprop ethyl ester	Soil	ng	15.010	15.010	0.000
Fenpiclonil	Soil	µg	-851.119	-851.147	0.028
Fenpropathrin	Soil	pg	583.866	583.866	0.000
Fenpropidin	Soil	ng	418.595	418.595	0.000
Fenpropimorph	Soil	ng	521.083	521.083	0.000
Fentin hydroxide	Soil	µg	1.309	1.265	0.044
Fipronil	Soil	mg	22.521	22.521	0.000
Florasulam	Soil	ng	2.897	2.897	0.000
Fluazifop	Soil	ng	31.437	31.437	0.000
Fluazifop-P-butyl	Soil	µg	-116.290	-116.291	0.000
Flucarbazone sodium salt	Soil	pg	36.490	36.490	0.000
Fludioxonil	Soil	µg	11.096	11.096	0.000
Flufenacet	Soil	µg	6.105	6.105	0.000
Flumetsulam	Soil	µg	1.445	1.445	0.000
Flumiclorac-pentyl	Soil	µg	2.397	2.397	0.000
Flumioxazin	Soil	µg	-257.445	-257.445	0.000
Fluoride	Soil	µg	3.095	3.130	-0.035
Flupyrsulfuron-methyl	Soil	pg	56.650	56.650	0.000

Fluquinconazole	Soil	pg	844.537	844.537	0.000
Fluroxypyr	Soil	ng	30.580	30.580	0.000
Flurtamone	Soil	ng	168.940	168.940	0.000
Flusilazole	Soil	ng	16.396	16.396	0.000
Flutolanil	Soil	µg	1.489	1.438	0.050
Folpet	Soil	ng	108.444	108.444	0.000
Fomesafen	Soil	mg	-1.759	-1.759	0.000
Foramsulfuron	Soil	ng	4.636	4.636	0.000
Fosetyl-aluminium	Soil	µg	2.376	2.376	0.000
Fungicides, unspecified	Soil	µg	2.218	2.218	0.000
Furathiocarb	Soil	ng	112.083	112.083	0.000
Glufosinate	Soil	µg	489.357	489.335	0.022
Glyphosate	Soil	g	2.530	2.530	0.000
Halosulfuron-methyl	Soil	pg	525.555	525.555	0.000
Heat, waste	Soil	MJ	49.413	4.705	44.708
Herbicides, unspecified	Soil	µg	877.370	877.370	0.000
Hexaconazole	Soil	ng	533.308	533.308	0.000
Hexazinone	Soil	ng	114.076	114.076	0.000
Hydramethylnon	Soil	ng	2.629	2.629	0.000
Hydrocarbons, unspecified	Soil	µg	8.447	8.447	0.000
Imazamox	Soil	µg	-238.275	-238.275	0.000
Imazapyr	Soil	pg	618.093	618.093	0.000
Imazaquin	Soil	µg	11.432	11.432	0.000
Imazethapyr	Soil	µg	-580.514	-580.515	0.000
Imidacloprid	Soil	mg	22.045	22.045	0.000
Indoxacarb	Soil	ng	800.256	800.256	0.000
Insecticides, unspecified	Soil	ng	92.624	92.624	0.000
Iodosulfuron	Soil	pg	56.302	56.302	0.000
Iodosulfuron-methyl-sodium	Soil	pg	35.350	35.350	0.000
Ioxynil	Soil	ng	279.780	279.780	0.000
Iprodione	Soil	µg	65.679	65.589	0.090
Iron	Soil	g	2.457	2.492	-0.034
Isoproturon	Soil	µg	1.667	1.667	0.000
Isoxaflutole	Soil	ng	141.282	141.282	0.000
Kaolin	Soil	ng	88.702	88.702	0.000
Kresoxim-methyl	Soil	ng	22.206	22.206	0.000
Lactofen	Soil	µg	11.513	11.513	0.000
Lambda-cyhalothrin	Soil	µg	30.451	30.451	0.000
Lead	Soil	mg	15.769	15.740	0.029
Lenacil	Soil	ng	67.730	67.730	0.000
Linuron	Soil	mg	63.056	63.056	0.000
Lithium	Soil	µg	3.361	3.361	0.000
Magnesium	Soil	g	1.620	1.621	-0.001
Malathion	Soil	mg	42.946	42.946	0.000
Maleic hydrazide	Soil	µg	8.275	7.996	0.279
Mancozeb	Soil	µg	223.586	218.837	4.748
Mandipropamid	Soil	pg	77.160	77.160	0.000
Maneb	Soil	ng	192.634	186.147	6.487
Manganese	Soil	g	1.001	1.002	-0.001

MCPB	Soil	ng	421.613	421.613	0.000
Mecoprop	Soil	ng	33.333	33.333	0.000
Mecoprop-P	Soil	ng	115.340	115.340	0.000
Mefenpyr	Soil	ng	30.189	30.189	0.000
Mefenpyr-diethyl	Soil	ng	15.614	15.614	0.000
Mepiquat chloride	Soil	µg	508.271	508.271	0.000
Mercury	Soil	µg	59.056	59.059	-0.003
Mesosulfuron-methyl (prop)	Soil	pg	195.000	195.000	0.000
Mesotrione	Soil	ng	200.886	200.886	0.000
Metalaxil	Soil	mg	5.161	5.161	0.000
Metalaxyl-M	Soil	µg	35.569	35.569	0.000
Metaldehyde	Soil	µg	131.460	131.460	0.000
Metam-sodium dihydrate	Soil	mg	14.964	14.919	0.045
Metamitron	Soil	µg	3.558	3.558	0.000
Metazachlor	Soil	µg	276.697	276.697	0.000
Metconazole	Soil	µg	11.295	11.295	0.000
Methiocarb	Soil	ng	9.661	9.661	0.000
Methomyl	Soil	pg	0.432	0.432	0.000
Methoxyfenozide	Soil	ng	110.702	110.702	0.000
Metiram	Soil	µg	5.621	5.432	0.189
Metolachlor	Soil	mg	452.884	452.884	0.000
Metosulam	Soil	pg	111.695	111.695	0.000
Metribuzin	Soil	mg	7.421	7.421	0.000
Metsulfuron-methyl	Soil	mg	12.944	12.944	0.000
Mineral oil	Soil	µg	53.296	53.296	0.000
Molinate	Soil	ng	157.490	157.490	0.000
Molybdenum	Soil	µg	204.443	204.555	-0.112
Monocrotophos	Soil	mg	57.555	57.555	0.000
Monosodium acid methanearsonate	Soil	mg	1.922	1.922	0.000
Myclobutanil	Soil	ng	101.248	101.248	0.000
Napropamide	Soil	µg	193.037	193.037	0.000
Nickel	Soil	mg	-4.630	-4.640	0.010
Nicosulfuron	Soil	ng	33.995	33.995	0.000
Nitrate	Soil	mg	3.873	3.873	0.000
Nitrogen	Soil	µg	57.389	57.389	0.000
Norflurazon	Soil	ng	155.126	155.126	0.000
Oils, biogenic	Soil	mg	249.770	249.745	0.025
Oils, unspecified	Soil	g	118.014	114.379	3.636
Orbencarb	Soil	µg	17.546	17.402	0.144
Organic carbon	Soil	µg	141.121	141.121	0.000
Oryzalin	Soil	ng	153.993	153.993	0.000
Oxamyl	Soil	µg	6.342	6.129	0.213
Oxydemeton methyl	Soil	ng	3.939	3.939	0.000
Oxyfluorfen	Soil	µg	1.513	1.513	0.000
PAH, polycyclic aromatic hydrocarbons	Soil	µg	10.084	10.084	0.000
Paraquat	Soil	mg	6.248	6.248	0.000
Parathion	Soil	ng	-465.546	-465.560	0.014
Parathion, methyl	Soil	µg	9.221	9.221	0.000
Pendimethalin	Soil	mg	-8.992	-8.993	0.000

Permethrin	Soil	µg	7.797	7.788	0.009
Pesticides, unspecified	Soil	mg	97.505	97.505	0.000
Phenmedipham	Soil	ng	658.686	658.686	0.000
Phenol, pentachloro-	Soil	ng	9.050	9.050	0.000
Phorate	Soil	µg	13.677	13.217	0.461
Phosmet	Soil	µg	1.541	1.490	0.051
Phosphorus	Soil	mg	490.218	490.519	-0.302
Picloram	Soil	pg	72.980	72.980	0.000
Picoxystrobin	Soil	ng	38.759	38.759	0.000
Piperonyl butoxide	Soil	ng	62.572	61.060	1.511
Pirimicarb	Soil	mg	-1.082	-1.082	0.000
Pirimiphos methyl	Soil	ng	423.367	423.367	0.000
Potassium	Soil	g	2.727	2.728	-0.002
Primisulfuron	Soil	ng	15.453	15.453	0.000
Prochloraz	Soil	ng	12.107	12.107	0.000
Procymidone	Soil	µg	18.690	18.690	0.000
Profenofos	Soil	mg	2.991	2.991	0.000
Prohexadione-calcium	Soil	pg	43.974	43.974	0.000
Prometryn	Soil	mg	1.606	1.606	0.000
Pronamide	Soil	pg	290.101	290.101	0.000
Propachlor	Soil	µg	4.155	4.155	0.000
Propamocarb HCl	Soil	ng	65.671	63.459	2.211
Propanil	Soil	ng	407.898	407.898	0.000
Propargite	Soil	µg	4.387	4.239	0.148
Propiconazole	Soil	µg	8.985	8.985	0.000
Propoxycarbazone-sodium (prop)	Soil	pg	243.793	243.793	0.000
Prosulfuron	Soil	ng	7.055	7.055	0.000
Prothioconazol	Soil	µg	55.756	55.756	0.000
Pymetrozine	Soil	ng	420.301	406.148	14.153
Pyraclostrobin (prop)	Soil	µg	25.459	25.459	0.000
Pyrethrin	Soil	ng	19.662	19.662	0.000
Pyrimethanil	Soil	ng	155.723	155.723	0.000
Pyrithiobac sodium salt	Soil	µg	107.437	107.437	0.000
Quinclorac	Soil	ng	6.813	6.813	0.000
Quinoxyfen	Soil	ng	2.132	2.132	0.000
Quizalofop-P	Soil	µg	-2.405	-2.405	0.000
Quizalofop-p-ethyl	Soil	ng	131.769	131.769	0.000
Quizalofop ethyl ester	Soil	µg	5.182	5.182	0.000
Rimsulfuron	Soil	ng	216.877	210.095	6.782
Rotenone	Soil	ng	11.010	11.010	0.000
Selenium	Soil	µg	51.538	51.538	0.000
Sethoxydim	Soil	µg	-4.662	-4.668	0.006
Silicon	Soil	g	4.210	4.213	-0.003
Silthiofam	Soil	ng	3.276	3.276	0.000
Silver	Soil	ng	258.331	258.331	0.000
Simazine	Soil	ng	983.066	983.066	0.000
Sodium	Soil	mg	1.754	1.755	-0.001
Spinosad	Soil	ng	18.876	18.581	0.295
Spiroxamine	Soil	µg	20.495	20.495	0.000

Strontium	Soil	µg	112.965	110.564	2.401
Sulfate	Soil	mg	6.466	6.466	0.000
Sulfentrazone	Soil	mg	-2.845	-2.845	0.000
Sulfosate	Soil	mg	-11.951	-11.951	0.000
Sulfosulfuron	Soil	pg	875.756	875.756	0.000
Sulfur	Soil	mg	508.322	508.598	-0.275
Sulfuric acid	Soil	mg	1.543	1.491	0.052
Tebuconazole	Soil	µg	88.104	88.104	0.000
Tebupirimphos	Soil	ng	129.806	129.806	0.000
Tebutam	Soil	µg	249.904	249.904	0.000
Teflubenzuron	Soil	ng	216.610	214.832	1.777
Tefluthrin	Soil	ng	102.762	102.762	0.000
Terbacil	Soil	µg	1.527	1.527	0.000
Terbufos	Soil	µg	4.652	4.652	0.000
Thiamethoxam	Soil	µg	186.911	186.898	0.013
Thiazole, 2-(thiocyanatemethylthio)benzo-	Soil	µg	127.525	123.231	4.294
Thidiazuron	Soil	µg	188.213	188.213	0.000
Thifensulfuron-methyl	Soil	ng	819.683	819.683	0.000
Thiobencarb	Soil	ng	87.299	87.299	0.000
Thiodicarb	Soil	µg	2.919	2.919	0.000
Thiram	Soil	mg	28.683	28.683	0.000
Tin	Soil	µg	51.572	51.562	0.009
Titanium	Soil	mg	70.003	70.045	-0.042
Tralkoxydim	Soil	ng	266.884	266.884	0.000
Triadimenol	Soil	ng	2.540	2.540	0.000
Triallate	Soil	ng	1.970	1.970	0.000
Triasulfuron	Soil	pg	583.849	583.849	0.000
Tribenuron	Soil	pg	212.260	212.260	0.000
Tribenuron-methyl	Soil	ng	470.142	470.142	0.000
Tribufos	Soil	mg	1.760	1.760	0.000
Trichlorfon	Soil	ng	6.567	6.346	0.221
Triclopyr	Soil	µg	3.739	3.739	0.000
Trifloxystrobin	Soil	ng	546.816	546.816	0.000
Trifluralin	Soil	mg	-7.111	-7.111	0.000
Triforine	Soil	ng	32.758	32.758	0.000
Trinexapac-ethyl	Soil	ng	236.316	236.316	0.000
Vanadium	Soil	mg	1.978	1.980	-0.001
Vinclozolin	Soil	µg	6.230	6.230	0.000
Zeta-cypermethrin	Soil	µg	3.449	3.449	0.000
Zinc	Soil	mg	-133.804	-135.911	2.107

Appendix 2

Full Life-Cycle Inventory for Landfilled Thermally-Modified Wood Decking

Substance	Compartment	Unit	Total	Thermally-modified deck (20' x 16')	Landfill scenario for thermally-modified wood deck
Carbon dioxide, in air	Raw	kg	433.575	433.575	0.000
Coal, 26.4 MJ per kg	Raw	g	29.921	11.619	18.302
Electricity usage	Raw	MJ	265.231	276.464	-11.233
Energy, unspecified	Raw	MJ	1.150	0.000	1.150
Gas, natural, 46.8 MJ per kg	Raw	g	114.738	114.738	0.000
Gas, natural/kg	Raw	g	1.961	0.000	1.961
Limestone	Raw	kg	4.215	4.212	0.003
Oil, crude	Raw	g	8.105	0.000	8.105
Oil, crude, 42 MJ per kg	Raw	g	517.775	517.775	0.000
Sand	Raw	mg	1.020	0.000	1.020
Uranium	Raw	µg	339.887	0.000	339.887
Uranium, 2291 GJ per kg	Raw	mg	1.743	1.743	0.000
Water, process and cooling, unspecified natural origin	Raw	dm3	363.414	363.414	0.000
Water, well, in ground	Raw	dm3	76.988	76.988	0.000
Water, well, in ground, US	Raw	cu.in	-29.831	31.945	-61.776
Wood and wood waste, 20.9 MJ per kg, ovendry basis	Raw	kg	36.527	36.527	0.000
Wood, soft, NE-NC, standing	Raw	dm3	527.014	527.014	0.000
Energy, gross calorific value, in biomass	Raw	MMBTU	1.007	1.007	0.000
Energy, gross calorific value, in biomass, primary forest	Raw	MJ	2.701	2.701	0.000
Peat	Raw	g	5.138	5.062	0.076
Wood, hard, standing	Raw	fl. oz	945.232	945.432	-0.199
Wood, primary forest, standing	Raw	cm3	249.843	249.842	0.001
Wood, soft, standing	Raw	dm3	73.188	73.202	-0.014
Wood, unspecified, standing/m3	Raw	mm3	10.102	9.954	0.149
Argon	Raw	g	9.984	9.984	0.000
Carbon dioxide, in air	Raw	kg	95.673	95.678	-0.004
Energy, kinetic (in wind), converted	Raw	MJ	9.853	10.232	-0.380
Energy, solar, converted	Raw	kJ	444.524	456.089	-11.565
Krypton	Raw	µg	17.931	17.931	0.000
Nitrogen	Raw	g	538.446	538.446	0.000
Oxygen	Raw	g	188.754	188.754	0.000
Xenon	Raw	µg	2.104	2.104	0.000
Aluminium	Raw	g	9.232	8.502	0.730
Anhydrite	Raw	mg	4.288	4.135	0.153
Barite	Raw	mg	434.993	432.309	2.685
Basalt	Raw	mg	173.072	173.085	-0.013
Borax	Raw	µg	916.775	931.832	-15.057
Cadmium	Raw	mg	9.617	9.503	0.114
Calcite	Raw	kg	1.699	1.690	0.009
Carbon, organic, in soil or biomass stock	Raw	g	39.113	39.113	0.000
Cerium	Raw	µg	88.132	88.132	0.000
Chromium	Raw	g	120.043	108.382	11.662
Chrysotile	Raw	mg	4.863	4.864	-0.001
Cinnabar	Raw	µg	419.505	415.031	4.475
Clay	Raw	g	4.187	3.396	0.792
Clay, bentonite	Raw	g	45.998	45.737	0.261
Clay, unspecified	Raw	g	27.878	27.878	0.000
Coal, 26.4 MJ per kg	Raw	kg	19.996	19.627	0.368
Coal, brown	Raw	g	415.026	415.082	-0.056
Coal, hard	Raw	kg	22.880	23.687	-0.807
Cobalt	Raw	µg	913.043	892.696	20.347
Cobalt, Co 5.0E-2%, in mixed ore	Raw	µg	78.418	78.418	0.000
Colemanite	Raw	g	1.052	1.052	0.000

Copper, 0.52% in sulfide, Cu 0.27% and Mo 8.2E-3% in crude ore	Raw	g	6.005	6.005	0.000
Copper, 0.59% in sulfide, Cu 0.22% and Mo 8.2E-3% in crude ore	Raw	g	8.430	8.430	0.000
Copper, 0.97% in sulfide, Cu 0.36% and Mo 4.1E-2% in crude ore	Raw	g	9.035	9.035	0.000
Copper, 0.99% in sulfide, Cu 0.36% and Mo 8.2E-3% in crude ore	Raw	mg	72.538	72.544	-0.007
Copper, 1.13% in sulfide, Cu 0.76% and Ni 0.76% in crude ore	Raw	mg	46.406	46.406	0.000
Copper, 1.18% in sulfide, Cu 0.39% and Mo 8.2E-3% in crude ore	Raw	g	9.976	9.976	0.000
Copper, 1.42% in sulfide, Cu 0.81% and Mo 8.2E-3% in crude ore	Raw	mg	6.104	6.117	-0.013
Copper, 2.19% in sulfide, Cu 1.83% and Mo 8.2E-3% in crude ore	Raw	mg	28.182	28.245	-0.063
Copper, Cu 0.2%, in mixed ore	Raw	µg	192.067	192.067	0.000
Copper, Cu 0.38%, Au 9.7E-4%, Ag 9.7E-4%, Zn 0.63%, Pb 0.014%, in ore	Raw	mg	62.111	62.111	0.000
Copper, Cu 3.2E+0%, Pt 2.5E-4%, Pd 7.3E-4%, Rh 2.0E-5%, Ni 2.3E+0% in or	Raw	mg	1.066	1.066	0.000
Copper, Cu 5.2E-2%, Pt 4.8E-4%, Pd 2.0E-4%, Rh 2.4E-5%, Ni 3.7E-2% in ore	Raw	mg	36.208	36.208	0.000
Diatomite	Raw	µg	34.169	34.173	-0.004
Dolomite	Raw	g	82.969	82.876	0.093
Energy, geothermal, converted	Raw	kJ	78.336	78.336	0.000
Europium	Raw	ng	220.801	220.801	0.000
Feldspar	Raw	µg	444.084	441.458	2.626
Fluorine	Raw	mg	847.557	847.149	0.409
Fluorine, 4.5% in apatite, 3% in crude ore	Raw	g	1.014	1.014	0.000
Fluorspar	Raw	g	3.919	3.931	-0.012
Gadolinium	Raw	ng	551.059	551.059	0.000
Gallium	Raw	ng	2.430	2.430	0.000
Gangue, bauxite	Raw	g	69.331	69.331	0.000
Gas, mine, off-gas, process, coal mining/m3	Raw	dm3	157.179	162.303	-5.125
Gas, natural/m3	Raw	m3	6.030	12.994	-6.964
Gold	Raw	µg	19.169	19.169	0.000
Gold, Au 1.0E-7%, in mixed ore	Raw	ng	16.177	16.177	0.000
Gold, Au 1.1E-4%, Ag 4.2E-3%, in ore	Raw	µg	4.490	4.490	0.000
Gold, Au 1.3E-4%, Ag 4.6E-5%, in ore	Raw	µg	6.459	6.459	0.000
Gold, Au 1.8E-4%, in mixed ore	Raw	ng	229.243	229.243	0.000
Gold, Au 2.1E-4%, Ag 2.1E-4%, in ore	Raw	µg	1.457	1.457	0.000
Gold, Au 4.3E-4%, in ore	Raw	µg	3.749	3.749	0.000
Gold, Au 4.9E-5%, in ore	Raw	µg	18.763	18.763	0.000
Gold, Au 5.4E-4%, Ag 1.5E-5%, in ore	Raw	ng	169.908	169.908	0.000
Gold, Au 6.7E-4%, in ore	Raw	µg	20.031	20.032	0.000
Gold, Au 6.8E-4%, Ag 1.5E-4%, in ore	Raw	ng	230.889	230.889	0.000
Gold, Au 7.1E-4%, in ore	Raw	µg	9.313	9.313	0.000
Gold, Au 9.7E-4%, Ag 9.7E-4%, Zn 0.63%, Cu 0.38%, Pb 0.014%, in ore	Raw	µg	1.517	1.517	0.000
Gold, Au 9.7E-5%, Ag 7.6E-5%, in ore	Raw	ng	835.287	835.287	0.000
Granite	Raw	ng	239.177	239.215	-0.038
Gravel	Raw	kg	150.503	1.151	149.352
Gypsum	Raw	g	2.495	2.495	0.000
Indium	Raw	µg	160.285	158.385	1.900
Iron	Raw	kg	4.013	3.988	0.025
Kaolinite	Raw	mg	235.424	238.188	-2.764
Kieserite	Raw	mg	1.876	1.763	0.113
Lanthanum	Raw	µg	26.421	26.421	0.000
Lead	Raw	mg	157.725	157.705	0.020
Lead, Pb 0.014%, Au 9.7E-4%, Ag 9.7E-4%, Zn 0.63%, Cu 0.38%, in ore	Raw	mg	7.507	7.507	0.000
Lead, Pb 3.6E-1%, in mixed ore	Raw	µg	345.709	345.709	0.000
Lithium	Raw	mg	191.151	191.151	0.000
Magnesite	Raw	g	78.477	77.942	0.535
Manganese	Raw	g	77.609	77.583	0.026
Metamorphous rock, graphite containing	Raw	mg	41.480	41.541	-0.062

Molybdenum	Raw	g	1.038	1.037	0.001
Molybdenum, 0.010% in sulfide, Mo 8.2E-3% and Cu 1.83% in crude ore	Raw	µg	733.905	735.082	-1.177
Molybdenum, 0.014% in sulfide, Mo 8.2E-3% and Cu 0.81% in crude ore	Raw	µg	113.289	113.456	-0.167
Molybdenum, 0.016% in sulfide, Mo 8.2E-3% and Cu 0.27% in crude ore	Raw	mg	143.978	143.978	0.000
Molybdenum, 0.022% in sulfide, Mo 8.2E-3% and Cu 0.22% in crude ore	Raw	mg	188.294	188.294	0.000
Molybdenum, 0.022% in sulfide, Mo 8.2E-3% and Cu 0.36% in crude ore	Raw	mg	4.800	4.509	0.291
Molybdenum, 0.025% in sulfide, Mo 8.2E-3% and Cu 0.39% in crude ore	Raw	mg	198.963	198.963	-0.001
Neodymium	Raw	µg	14.531	14.531	0.000
Nickel, 1.13% in sulfide, Ni 0.76% and Cu 0.76% in crude ore	Raw	mg	113.175	113.385	-0.210
Nickel, 1.98% in silicates, 1.04% in crude ore	Raw	g	96.010	69.323	26.687
Nickel, Ni 2.3E+0%, Pt 2.5E-4%, Pd 7.3E-4%, Rh 2.0E-5%, Cu 3.2E+0% in ore	Raw	mg	24.409	24.409	0.000
Nickel, Ni 2.5E+0%, in mixed ore	Raw	mg	3.842	3.842	0.000
Nickel, Ni 3.7E-2%, Pt 4.8E-4%, Pd 2.0E-4%, Rh 2.4E-5%, Cu 5.2E-2% in ore	Raw	mg	3.418	3.418	0.000
Oil, crude	Raw	kg	90.861	84.496	6.365
Olivine	Raw	mg	1.535	1.463	0.072
Palladium, Pd 1.6E-6%, in mixed ore	Raw	ng	256.707	256.707	0.000
Palladium, Pd 2.0E-4%, Pt 4.8E-4%, Rh 2.4E-5%, Ni 3.7E-2%, Cu 5.2E-2% in	Raw	µg	884.217	883.327	0.890
Palladium, Pd 7.3E-4%, Pt 2.5E-4%, Rh 2.0E-5%, Ni 2.3E+0%, Cu 3.2E+0% in	Raw	mg	2.117	2.114	0.002
Perlite	Raw	mg	2.861	2.861	0.000
Phosphorus	Raw	g	4.081	4.080	0.001
Phosphorus, 18% in apatite, 4% in crude ore	Raw	g	3.390	3.389	0.002
Platinum, Pt 2.5E-4%, Pd 7.3E-4%, Rh 2.0E-5%, Ni 2.3E+0%, Cu 3.2E+0% in	Raw	µg	22.836	22.816	0.020
Platinum, Pt 4.7E-7%, in mixed ore	Raw	ng	74.254	74.254	0.000
Platinum, Pt 4.8E-4%, Pd 2.0E-4%, Rh 2.4E-5%, Ni 3.7E-2%, Cu 5.2E-2% in o	Raw	µg	88.093	88.019	0.073
Potassium chloride	Raw	g	32.127	32.126	0.001
Praseodymium	Raw	µg	1.542	1.542	0.000
Pumice	Raw	mg	195.024	195.024	0.000
Rhenium	Raw	µg	46.097	46.066	0.031
Rhodium, Rh 1.6E-7%, in mixed ore	Raw	ng	25.193	25.193	0.000
Rhodium, Rh 2.0E-5%, Pt 2.5E-4%, Pd 7.3E-4%, Ni 2.3E+0%, Cu 3.2E+0% in	Raw	µg	20.273	20.252	0.020
Rhodium, Rh 2.4E-5%, Pt 4.8E-4%, Pd 2.0E-4%, Ni 3.7E-2%, Cu 5.2E-2% in o	Raw	µg	63.622	63.558	0.064
Samarium	Raw	µg	1.100	1.100	0.000
Sand	Raw	mg	123.301	119.457	3.845
Shale	Raw	mg	662.781	662.348	0.433
Silver, 0.007% in sulfide, Ag 0.004%, Pb, Zn, Cd, In	Raw	µg	230.075	230.078	-0.003
Silver, 3.2ppm in sulfide, Ag 1.2ppm, Cu and Te, in crude ore	Raw	ng	346.771	348.834	-2.062
Silver, Ag 1.5E-4%, Au 6.8E-4%, in ore	Raw	ng	51.823	51.823	0.000
Silver, Ag 1.5E-5%, Au 5.4E-4%, in ore	Raw	ng	4.744	4.744	0.000
Silver, Ag 1.8E-6%, in mixed ore	Raw	ng	286.408	286.408	0.000
Silver, Ag 2.1E-4%, Au 2.1E-4%, in ore	Raw	µg	1.447	1.447	0.000
Silver, Ag 4.2E-3%, Au 1.1E-4%, in ore	Raw	µg	167.549	167.550	0.000
Silver, Ag 4.6E-5%, Au 1.3E-4%, in ore	Raw	µg	2.356	2.356	0.000
Silver, Ag 5.4E-3%, in mixed ore	Raw	µg	5.226	5.226	0.000
Silver, Ag 7.6E-5%, Au 9.7E-5%, in ore	Raw	ng	654.443	654.443	0.000
Silver, Ag 9.7E-4%, Au 9.7E-4%, Zn 0.63%, Cu 0.38%, Pb 0.014%, in ore	Raw	µg	76.577	76.577	0.000
Sodium chloride	Raw	g	188.819	186.989	1.830
Sodium nitrate	Raw	ng	43.550	10.016	33.534
Sodium sulfate	Raw	mg	416.143	413.334	2.809
Spodumene	Raw	µg	133.642	133.642	0.000
Stibnite	Raw	µg	3.551	3.551	0.000
Strontium	Raw	µg	177.088	177.088	0.000
Sulfur	Raw	mg	970.963	968.717	2.246
Talc	Raw	mg	27.074	27.411	-0.337
Tantalum	Raw	mg	2.497	2.497	0.000

Tellurium	Raw	ng	52.017	52.327	-0.309
Tin	Raw	mg	3.876	3.876	0.000
TiO2, 54% in ilmenite, 18% in crude ore	Raw	mg	17.192	17.192	0.000
TiO2, 54% in ilmenite, 2.6% in crude ore	Raw	g	2.060	2.101	-0.041
TiO2, 95% in rutile, 0.40% in crude ore	Raw	mg	35.694	35.661	0.033
Ulexite	Raw	µg	837.550	837.562	-0.013
Uranium	Raw	mg	452.271	470.589	-18.318
Uranium oxide, 332 GJ per kg, in ore	Raw	mg	488.426	479.531	8.894
Vermiculite	Raw	mg	65.639	65.639	0.000
Volume occupied, final repository for low-active radioactive waste	Raw	mm3	724.094	751.484	-27.390
Volume occupied, final repository for radioactive waste	Raw	mm3	137.943	143.628	-5.685
Volume occupied, underground deposit	Raw	cm3	1.374	1.384	-0.009
Water, unspecified natural origin, BR	Raw	mm3	2.614	2.614	0.000
Water, unspecified natural origin, CH	Raw	mm3	26.842	26.842	0.000
Water, unspecified natural origin, CN	Raw	mm3	0.000	0.000	0.000
Water, unspecified natural origin, CO	Raw	mm3	1.489	1.489	0.000
Water, unspecified natural origin, DE	Raw	mm3	0.000	0.000	0.000
Water, unspecified natural origin, Europe without Switzerland	Raw	mm3	0.000	0.000	0.000
Water, unspecified natural origin, GLO	Raw	mm3	3.853	3.853	0.000
Water, unspecified natural origin, HN	Raw	mm3	1.009	1.009	0.000
Water, unspecified natural origin, ID	Raw	mm3	2.427	2.427	0.000
Water, unspecified natural origin, IN	Raw	mm3	1.062	1.062	0.000
Water, unspecified natural origin, RER	Raw	mm3	7.180	7.180	0.000
Water, unspecified natural origin, RNA	Raw	mm3	0.000	0.000	0.000
Water, unspecified natural origin, RoW	Raw	mm3	35.620	35.620	0.000
Water, unspecified natural origin, US	Raw	mm3	0.002	0.002	0.000
Water, unspecified natural origin, VN	Raw	mm3	4.641	4.641	0.000
Zinc	Raw	g	1.221	1.216	0.004
Zinc, Zn 0.63%, Au 9.7E-4%, Ag 9.7E-4%, Cu 0.38%, Pb 0.014%, in ore	Raw	mg	9.731	9.731	0.000
Zinc, Zn 3.1%, in mixed ore	Raw	mg	2.967	2.967	0.000
Zirconium	Raw	mg	34.626	34.626	0.000
Bromine	Raw	g	35.741	35.741	0.000
Carnallite	Raw	mg	35.065	35.065	0.000
Energy, potential (in hydropower reservoir), converted	Raw	MJ	29.089	29.554	-0.465
Iodine	Raw	g	2.916	2.916	0.000
Magnesium	Raw	ng	102.863	103.800	-0.937
Volume occupied, reservoir	Raw	m3day	87.521	90.507	-2.986
Water, cooling, unspecified natural origin, AT	Raw	cm3	395.614	395.614	0.000
Water, cooling, unspecified natural origin, AU	Raw	cu.in	131.467	131.467	0.000
Water, cooling, unspecified natural origin, BA	Raw	cm3	100.260	100.260	0.000
Water, cooling, unspecified natural origin, BE	Raw	cu.in	66.306	66.306	0.000
Water, cooling, unspecified natural origin, BG	Raw	cm3	599.477	599.477	0.000
Water, cooling, unspecified natural origin, BR	Raw	cu.in	78.641	78.641	0.000
Water, cooling, unspecified natural origin, CA	Raw	cu.in	254.610	254.610	0.000
Water, cooling, unspecified natural origin, CH	Raw	cm3	879.766	879.766	0.000
Water, cooling, unspecified natural origin, CL	Raw	cm3	377.113	377.113	0.000
Water, cooling, unspecified natural origin, CN	Raw	dm3	34.837	34.837	0.000
Water, cooling, unspecified natural origin, CY	Raw	cm3	47.507	47.507	0.000
Water, cooling, unspecified natural origin, CZ	Raw	cu.in	316.812	316.812	0.000
Water, cooling, unspecified natural origin, DE	Raw	cu.in	459.442	459.442	0.000
Water, cooling, unspecified natural origin, DK	Raw	cm3	254.249	254.249	0.000
Water, cooling, unspecified natural origin, EE	Raw	cm3	165.549	165.549	0.000
Water, cooling, unspecified natural origin, ES	Raw	cu.in	161.384	161.384	0.000
Water, cooling, unspecified natural origin, Europe without Switzerland	Raw	cm3	427.186	427.186	0.000

Water, cooling, unspecified natural origin, FI	Raw	cm3	578.710	578.710	0.000
Water, cooling, unspecified natural origin, FR	Raw	cu.in	472.530	472.530	0.000
Water, cooling, unspecified natural origin, GB	Raw	cu.in	202.543	202.543	0.000
Water, cooling, unspecified natural origin, GLO	Raw	cu.in	256.789	256.789	0.000
Water, cooling, unspecified natural origin, GR	Raw	cu.in	98.338	98.338	0.000
Water, cooling, unspecified natural origin, HR	Raw	cm3	120.831	120.831	0.000
Water, cooling, unspecified natural origin, HU	Raw	cm3	574.157	574.157	0.000
Water, cooling, unspecified natural origin, ID	Raw	cu.in	112.057	112.057	0.000
Water, cooling, unspecified natural origin, IE	Raw	cm3	233.982	233.982	0.000
Water, cooling, unspecified natural origin, IN	Raw	cu.in	594.972	594.972	0.000
Water, cooling, unspecified natural origin, IR	Raw	cu.in	180.162	180.162	0.000
Water, cooling, unspecified natural origin, IS	Raw	mm3	49.573	49.573	0.000
Water, cooling, unspecified natural origin, IT	Raw	cu.in	152.468	152.468	0.000
Water, cooling, unspecified natural origin, JP	Raw	cu.in	392.651	392.651	0.000
Water, cooling, unspecified natural origin, KR	Raw	cu.in	287.617	287.617	0.000
Water, cooling, unspecified natural origin, LT	Raw	cm3	101.309	101.309	0.000
Water, cooling, unspecified natural origin, LU	Raw	cm3	43.749	43.749	0.000
Water, cooling, unspecified natural origin, LV	Raw	cm3	86.409	86.409	0.000
Water, cooling, unspecified natural origin, MA	Raw	cm3	1.284	1.284	0.000
Water, cooling, unspecified natural origin, MK	Raw	cm3	67.740	67.740	0.000
Water, cooling, unspecified natural origin, MT	Raw	cm3	37.463	37.463	0.000
Water, cooling, unspecified natural origin, MX	Raw	cu.in	129.009	129.009	0.000
Water, cooling, unspecified natural origin, MY	Raw	cu.in	67.724	67.724	0.000
Water, cooling, unspecified natural origin, NL	Raw	cu.in	78.854	78.854	0.000
Water, cooling, unspecified natural origin, NO	Raw	cm3	32.162	32.162	0.000
Water, cooling, unspecified natural origin, PE	Raw	cm3	205.464	205.464	0.000
Water, cooling, unspecified natural origin, PH	Raw	mm3	37.284	37.284	0.000
Water, cooling, unspecified natural origin, PL	Raw	cu.in	499.692	499.692	0.000
Water, cooling, unspecified natural origin, PT	Raw	cm3	349.443	349.443	0.000
Water, cooling, unspecified natural origin, RER	Raw	cu.in	919.839	919.839	0.000
Water, cooling, unspecified natural origin, RNA	Raw	mm3	0.534	0.534	0.000
Water, cooling, unspecified natural origin, RO	Raw	cm3	896.961	896.961	0.000
Water, cooling, unspecified natural origin, RoW	Raw	dm3	83.858	83.858	0.000
Water, cooling, unspecified natural origin, RS	Raw	cm3	409.669	409.669	0.000
Water, cooling, unspecified natural origin, RU	Raw	dm3	35.104	35.104	0.000
Water, cooling, unspecified natural origin, SA	Raw	cu.in	220.340	220.340	0.000
Water, cooling, unspecified natural origin, SE	Raw	cu.in	67.632	67.632	0.000
Water, cooling, unspecified natural origin, SI	Raw	cu.in	61.074	61.074	0.000
Water, cooling, unspecified natural origin, SK	Raw	cm3	986.242	986.242	0.000
Water, cooling, unspecified natural origin, TH	Raw	cu.in	72.273	72.273	0.000
Water, cooling, unspecified natural origin, TR	Raw	cu.in	102.730	102.730	0.000
Water, cooling, unspecified natural origin, TW	Raw	cu.in	110.891	110.891	0.000
Water, cooling, unspecified natural origin, TZ	Raw	cm3	48.559	48.559	0.000
Water, cooling, unspecified natural origin, UA	Raw	cu.in	175.782	175.782	0.000
Water, cooling, unspecified natural origin, US	Raw	m3	2.515	2.568	-0.053
Water, cooling, unspecified natural origin, WEU	Raw	mm3	6.660	6.660	0.000
Water, cooling, unspecified natural origin, ZA	Raw	cu.in	136.586	136.586	0.000
Water, cooling, unspecified natural origin/m3	Raw	fl. oz	790.558	812.935	-22.377
Water, lake	Raw	mm3	877.064	874.531	2.533
Water, lake, AT	Raw	mm3	0.057	0.057	0.000
Water, lake, BE	Raw	mm3	0.118	0.118	0.000
Water, lake, BG	Raw	mm3	0.208	0.208	0.000
Water, lake, CA	Raw	cm3	140.947	140.947	0.000
Water, lake, CH	Raw	cm3	7.470	7.470	0.000

Water, lake, CN	Raw	mm3	0.154	0.154	0.000
Water, lake, CZ	Raw	mm3	0.008	0.008	0.000
Water, lake, DE	Raw	mm3	1.643	1.643	0.000
Water, lake, DK	Raw	mm3	0.095	0.095	0.000
Water, lake, ES	Raw	mm3	0.083	0.083	0.000
Water, lake, Europe without Switzerland	Raw	cm3	7.919	7.919	0.000
Water, lake, FI	Raw	mm3	0.032	0.032	0.000
Water, lake, FR	Raw	mm3	0.253	0.253	0.000
Water, lake, GB	Raw	mm3	0.230	0.230	0.000
Water, lake, GLO	Raw	mm3	5.080	5.080	0.000
Water, lake, HU	Raw	mm3	0.032	0.032	0.000
Water, lake, IT	Raw	mm3	0.246	0.246	0.000
Water, lake, JP	Raw	mm3	0.408	0.408	0.000
Water, lake, KR	Raw	mm3	0.031	0.031	0.000
Water, lake, LU	Raw	mm3	0.005	0.005	0.000
Water, lake, NL	Raw	mm3	0.232	0.232	0.000
Water, lake, NO	Raw	mm3	0.013	0.013	0.000
Water, lake, PL	Raw	mm3	0.005	0.005	0.000
Water, lake, PT	Raw	mm3	0.029	0.029	0.000
Water, lake, RER	Raw	mm3	86.634	86.634	0.000
Water, lake, RNA	Raw	mm3	0.045	0.045	0.000
Water, lake, RoW	Raw	cm3	108.195	108.195	0.000
Water, lake, RU	Raw	mm3	0.158	0.158	0.000
Water, lake, SE	Raw	mm3	0.199	0.199	0.000
Water, lake, SK	Raw	mm3	0.003	0.003	0.000
Water, lake, TR	Raw	mm3	0.006	0.006	0.000
Water, lake, TW	Raw	mm3	0.152	0.152	0.000
Water, lake, US	Raw	cu.in	115.277	99.514	15.764
Water, river	Raw	cu.in	68.729	69.914	-1.185
Water, river, AT	Raw	mm3	130.089	130.089	0.000
Water, river, AU	Raw	cm3	1.342	1.342	0.000
Water, river, BE	Raw	mm3	271.803	271.803	0.000
Water, river, BG	Raw	mm3	475.783	475.783	0.000
Water, river, BR	Raw	cm3	157.792	157.792	0.000
Water, river, CA	Raw	cm3	442.178	442.178	0.000
Water, river, CH	Raw	cm3	39.798	39.798	0.000
Water, river, CN	Raw	cm3	63.626	63.626	0.000
Water, river, CZ	Raw	mm3	17.636	17.636	0.000
Water, river, DE	Raw	cm3	22.522	22.522	0.000
Water, river, DK	Raw	mm3	217.339	217.339	0.000
Water, river, ES	Raw	cm3	2.163	2.163	0.000
Water, river, Europe without Switzerland	Raw	cm3	196.915	196.915	0.000
Water, river, FI	Raw	mm3	73.171	73.171	0.000
Water, river, FR	Raw	mm3	934.571	934.571	0.000
Water, river, GB	Raw	mm3	527.968	527.968	0.000
Water, river, GLO	Raw	cu.in	189.697	189.697	0.000
Water, river, HU	Raw	mm3	74.354	74.354	0.000
Water, river, IN	Raw	cm3	113.507	113.507	0.000
Water, river, IT	Raw	mm3	565.357	565.357	0.000
Water, river, JP	Raw	cm3	1.185	1.185	0.000
Water, river, KR	Raw	cm3	54.822	54.822	0.000
Water, river, LU	Raw	mm3	11.791	11.791	0.000
Water, river, MY	Raw	cm3	1.324	1.324	0.000
Water, river, NL	Raw	mm3	554.547	554.547	0.000

Water, river, NO	Raw	mm3	28.811	28.811	0.000
Water, river, PE	Raw	mm3	8.160	8.160	0.000
Water, river, PH	Raw	cm3	8.655	8.655	0.000
Water, river, PL	Raw	mm3	10.418	10.418	0.000
Water, river, PT	Raw	mm3	67.344	67.344	0.000
Water, river, RAS	Raw	cu.in	94.148	94.148	0.000
Water, river, RER	Raw	cu.in	155.478	155.478	0.000
Water, river, RLA	Raw	cm3	702.814	702.814	0.000
Water, river, RNA	Raw	cu.in	89.115	89.115	0.000
Water, river, RO	Raw	cm3	40.827	40.827	0.000
Water, river, RoW	Raw	cu.in	458.159	458.159	0.000
Water, river, RU	Raw	cm3	23.757	23.757	0.000
Water, river, SE	Raw	mm3	393.714	393.714	0.000
Water, river, SK	Raw	mm3	6.625	6.625	0.000
Water, river, TN	Raw	mm3	86.952	86.952	0.000
Water, river, TR	Raw	mm3	13.929	13.929	0.000
Water, river, TW	Raw	mm3	349.780	349.780	0.000
Water, river, TZ	Raw	mm3	124.733	124.733	0.000
Water, river, US	Raw	dm3	160.497	163.680	-3.183
Water, river, WEU	Raw	mm3	0.001	0.001	0.000
Water, river, ZA	Raw	cm3	2.876	2.876	0.000
Water, salt, ocean	Raw	cu.in	944.665	931.838	12.827
Water, salt, sole	Raw	m3	15.592	15.591	0.001
Water, turbine use, unspecified natural origin	Raw	dm3	31.844	32.245	-0.402
Water, turbine use, unspecified natural origin, AT	Raw	dm3	363.859	363.859	0.000
Water, turbine use, unspecified natural origin, AU	Raw	dm3	98.128	98.128	0.000
Water, turbine use, unspecified natural origin, BA	Raw	cu.in	302.272	302.272	0.000
Water, turbine use, unspecified natural origin, BE	Raw	cu.in	335.682	335.682	0.000
Water, turbine use, unspecified natural origin, BG	Raw	dm3	32.872	32.872	0.000
Water, turbine use, unspecified natural origin, BR	Raw	dm3	563.130	563.130	0.000
Water, turbine use, unspecified natural origin, CA	Raw	dm3	575.764	575.764	0.000
Water, turbine use, unspecified natural origin, CH	Raw	dm3	349.453	349.453	0.000
Water, turbine use, unspecified natural origin, CL	Raw	dm3	153.125	153.125	0.000
Water, turbine use, unspecified natural origin, CN	Raw	m3	6.949	6.949	0.000
Water, turbine use, unspecified natural origin, CZ	Raw	fl. oz	734.439	734.439	0.000
Water, turbine use, unspecified natural origin, DE	Raw	dm3	193.393	193.393	0.000
Water, turbine use, unspecified natural origin, DK	Raw	cm3	187.793	187.793	0.000
Water, turbine use, unspecified natural origin, EE	Raw	cm3	501.996	501.996	0.000
Water, turbine use, unspecified natural origin, ES	Raw	dm3	136.511	136.511	0.000
Water, turbine use, unspecified natural origin, FI	Raw	dm3	56.315	56.315	0.000
Water, turbine use, unspecified natural origin, FR	Raw	dm3	553.969	553.969	0.000
Water, turbine use, unspecified natural origin, GB	Raw	dm3	49.017	49.017	0.000
Water, turbine use, unspecified natural origin, GLO	Raw	cm3	1.850	1.850	0.000
Water, turbine use, unspecified natural origin, GR	Raw	dm3	37.469	37.469	0.000
Water, turbine use, unspecified natural origin, HR	Raw	cu.in	148.066	148.066	0.000
Water, turbine use, unspecified natural origin, HU	Raw	cu.in	139.040	139.040	0.000
Water, turbine use, unspecified natural origin, ID	Raw	fl. oz	613.182	613.182	0.000
Water, turbine use, unspecified natural origin, IE	Raw	cu.in	435.368	435.368	0.000
Water, turbine use, unspecified natural origin, IN	Raw	dm3	127.487	127.487	0.000
Water, turbine use, unspecified natural origin, IR	Raw	dm3	93.054	93.054	0.000
Water, turbine use, unspecified natural origin, IS	Raw	fl. oz	740.874	740.874	0.000
Water, turbine use, unspecified natural origin, IT	Raw	dm3	131.944	131.944	0.000
Water, turbine use, unspecified natural origin, JP	Raw	dm3	457.319	457.319	0.000
Water, turbine use, unspecified natural origin, KR	Raw	fl. oz	826.976	826.976	0.000

Water, turbine use, unspecified natural origin, LT	Raw	cu.in	235.673	235.673	0.000
Water, turbine use, unspecified natural origin, LU	Raw	cu.in	199.020	199.020	0.000
Water, turbine use, unspecified natural origin, LV	Raw	dm3	31.545	31.545	0.000
Water, turbine use, unspecified natural origin, MK	Raw	cu.in	118.128	118.128	0.000
Water, turbine use, unspecified natural origin, MX	Raw	dm3	246.323	246.323	0.000
Water, turbine use, unspecified natural origin, MY	Raw	fl. oz	832.238	832.238	0.000
Water, turbine use, unspecified natural origin, NL	Raw	cu.in	62.297	62.297	0.000
Water, turbine use, unspecified natural origin, NO	Raw	fl. oz	989.711	989.711	0.000
Water, turbine use, unspecified natural origin, PE	Raw	cu.in	179.666	179.666	0.000
Water, turbine use, unspecified natural origin, PL	Raw	fl. oz	771.927	771.927	0.000
Water, turbine use, unspecified natural origin, PT	Raw	dm3	38.236	38.236	0.000
Water, turbine use, unspecified natural origin, RER	Raw	cm3	46.706	46.706	0.000
Water, turbine use, unspecified natural origin, RNA	Raw	mm3	42.464	42.464	0.000
Water, turbine use, unspecified natural origin, RO	Raw	dm3	109.599	109.599	0.000
Water, turbine use, unspecified natural origin, RoW	Raw	m3	61.117	61.117	0.000
Water, turbine use, unspecified natural origin, RS	Raw	dm3	79.532	79.532	0.000
Water, turbine use, unspecified natural origin, RU	Raw	dm3	801.044	801.044	0.000
Water, turbine use, unspecified natural origin, SE	Raw	dm3	666.996	666.996	0.000
Water, turbine use, unspecified natural origin, SI	Raw	dm3	46.307	46.307	0.000
Water, turbine use, unspecified natural origin, SK	Raw	dm3	37.605	37.605	0.000
Water, turbine use, unspecified natural origin, TH	Raw	cu.in	712.919	712.919	0.000
Water, turbine use, unspecified natural origin, TR	Raw	dm3	262.438	262.438	0.000
Water, turbine use, unspecified natural origin, TW	Raw	dm3	41.611	41.611	0.000
Water, turbine use, unspecified natural origin, TZ	Raw	cu.in	145.108	145.108	0.000
Water, turbine use, unspecified natural origin, UA	Raw	dm3	92.614	92.614	0.000
Water, turbine use, unspecified natural origin, US	Raw	m3	215.389	219.415	-4.026
Water, turbine use, unspecified natural origin, ZA	Raw	cu.in	195.065	195.065	0.000
Water, unspecified natural origin, AT	Raw	mm3	487.928	487.928	0.000
Water, unspecified natural origin, AU	Raw	mm3	11.914	11.914	0.000
Water, unspecified natural origin, BE	Raw	mm3	962.422	962.422	0.000
Water, unspecified natural origin, BG	Raw	cm3	1.565	1.565	0.000
Water, unspecified natural origin, BR	Raw	mm3	126.878	126.878	0.000
Water, unspecified natural origin, CA	Raw	cm3	1.914	1.914	0.000
Water, unspecified natural origin, CH	Raw	cm3	38.565	38.565	0.000
Water, unspecified natural origin, CL	Raw	mm3	0.995	0.995	0.000
Water, unspecified natural origin, CN	Raw	cm3	3.579	3.579	0.000
Water, unspecified natural origin, CZ	Raw	mm3	151.219	151.219	0.000
Water, unspecified natural origin, DE	Raw	cm3	5.342	5.342	0.000
Water, unspecified natural origin, DK	Raw	mm3	715.843	715.843	0.000
Water, unspecified natural origin, EE	Raw	mm3	18.956	18.956	0.000
Water, unspecified natural origin, ES	Raw	mm3	651.880	651.880	0.000
Water, unspecified natural origin, Europe without Switzerland	Raw	cm3	7.072	7.072	0.000
Water, unspecified natural origin, FI	Raw	mm3	253.887	253.887	0.000
Water, unspecified natural origin, FR	Raw	cm3	1.996	1.996	0.000
Water, unspecified natural origin, GB	Raw	cm3	1.759	1.759	0.000
Water, unspecified natural origin, GLO	Raw	cu.in	688.301	688.301	0.000
Water, unspecified natural origin, HU	Raw	mm3	247.626	247.626	0.000
Water, unspecified natural origin, IAI Area, Africa	Raw	mm3	250.176	250.176	0.000
Water, unspecified natural origin, IAI Area, Asia, without China and GCC	Raw	mm3	456.479	456.479	0.000
Water, unspecified natural origin, IAI Area, EU27 & EFTA	Raw	cm3	2.731	2.731	0.000
Water, unspecified natural origin, IAI Area, Gulf Cooperation Council	Raw	mm3	550.538	550.538	0.000
Water, unspecified natural origin, IAI Area, North America, without Quebec	Raw	mm3	347.306	347.306	0.000
Water, unspecified natural origin, IAI Area, Russia & RER w/o EU27 & EFTA	Raw	mm3	818.718	818.718	0.000
Water, unspecified natural origin, IAI Area, South America	Raw	mm3	327.758	327.758	0.000

Water, unspecified natural origin, IN	Raw	mm3	58.139	58.139	0.000
Water, unspecified natural origin, IT	Raw	cm3	1.953	1.953	0.000
Water, unspecified natural origin, JP	Raw	cm3	3.806	3.806	0.000
Water, unspecified natural origin, KR	Raw	mm3	593.315	593.315	0.000
Water, unspecified natural origin, LU	Raw	mm3	38.838	38.838	0.000
Water, unspecified natural origin, MX	Raw	mm3	9.343	9.343	0.000
Water, unspecified natural origin, NL	Raw	cm3	1.856	1.856	0.000
Water, unspecified natural origin, NO	Raw	mm3	100.003	100.003	0.000
Water, unspecified natural origin, PG	Raw	mm3	99.359	99.359	0.000
Water, unspecified natural origin, PH	Raw	mm3	9.321	9.321	0.000
Water, unspecified natural origin, PL	Raw	mm3	55.052	55.052	0.000
Water, unspecified natural origin, PT	Raw	mm3	221.807	221.807	0.000
Water, unspecified natural origin, RAF	Raw	cm3	51.353	51.353	0.000
Water, unspecified natural origin, RER	Raw	cu.in	89.319	89.319	0.000
Water, unspecified natural origin, RME	Raw	cm3	504.973	504.973	0.000
Water, unspecified natural origin, RNA	Raw	cm3	6.077	6.077	0.000
Water, unspecified natural origin, RoW	Raw	cu.in	525.019	525.019	0.000
Water, unspecified natural origin, RU	Raw	cm3	73.101	73.101	0.000
Water, unspecified natural origin, SE	Raw	cm3	1.254	1.254	0.000
Water, unspecified natural origin, SK	Raw	mm3	34.228	34.228	0.000
Water, unspecified natural origin, TH	Raw	mm3	10.065	10.065	0.000
Water, unspecified natural origin, TR	Raw	mm3	75.177	75.177	0.000
Water, unspecified natural origin, TW	Raw	cm3	1.211	1.211	0.000
Water, unspecified natural origin, UA	Raw	mm3	6.426	6.426	0.000
Water, unspecified natural origin, UN-OCEANIA	Raw	mm3	327.729	327.729	0.000
Water, unspecified natural origin, US	Raw	dm3	207.558	8.802	198.756
Water, unspecified natural origin, WEU	Raw	mm3	1.161	1.161	0.000
Water, unspecified natural origin/m3	Raw	dm3	114.673	113.299	1.374
Water, well, in ground	Raw	cm3	300.671	250.092	50.579
Water, well, in ground, AT	Raw	mm3	2.261	2.261	0.000
Water, well, in ground, AU	Raw	cm3	139.028	139.028	0.000
Water, well, in ground, BE	Raw	mm3	4.724	4.724	0.000
Water, well, in ground, BG	Raw	mm3	8.272	8.272	0.000
Water, well, in ground, BR	Raw	cm3	36.227	36.227	0.000
Water, well, in ground, CA	Raw	cm3	23.254	23.254	0.000
Water, well, in ground, CH	Raw	cm3	38.314	38.314	0.000
Water, well, in ground, CN	Raw	cu.in	159.452	159.452	0.000
Water, well, in ground, CZ	Raw	mm3	0.307	0.307	0.000
Water, well, in ground, DE	Raw	cm3	20.917	20.917	0.000
Water, well, in ground, DK	Raw	mm3	3.778	3.778	0.000
Water, well, in ground, ES	Raw	cm3	1.167	1.167	0.000
Water, well, in ground, Europe without Switzerland	Raw	cm3	29.771	29.771	0.000
Water, well, in ground, FI	Raw	mm3	1.272	1.272	0.000
Water, well, in ground, FR	Raw	mm3	293.598	293.598	0.000
Water, well, in ground, GB	Raw	mm3	9.176	9.176	0.000
Water, well, in ground, GLO	Raw	cm3	26.126	26.126	0.000
Water, well, in ground, HU	Raw	mm3	1.293	1.293	0.000
Water, well, in ground, ID	Raw	cm3	241.464	241.464	0.000
Water, well, in ground, IN	Raw	cm3	41.288	41.288	0.000
Water, well, in ground, IT	Raw	mm3	9.826	9.826	0.000
Water, well, in ground, JP	Raw	mm3	16.304	16.304	0.000
Water, well, in ground, KR	Raw	mm3	1.242	1.242	0.000
Water, well, in ground, LU	Raw	mm3	0.205	0.205	0.000
Water, well, in ground, MA	Raw	mm3	64.514	64.514	0.000

Water, well, in ground, MY	Raw	mm3	115.165	115.165	0.000
Water, well, in ground, NL	Raw	mm3	9.273	9.273	0.000
Water, well, in ground, NO	Raw	mm3	0.501	0.501	0.000
Water, well, in ground, NORDEL	Raw	mm3	308.206	308.206	0.000
Water, well, in ground, PE	Raw	mm3	13.231	13.231	0.000
Water, well, in ground, PG	Raw	mm3	858.100	858.100	0.000
Water, well, in ground, PH	Raw	cm3	1.353	1.353	0.000
Water, well, in ground, PL	Raw	cm3	160.679	160.679	0.000
Water, well, in ground, PT	Raw	mm3	1.170	1.170	0.000
Water, well, in ground, RER	Raw	cm3	506.669	506.669	0.000
Water, well, in ground, RLA	Raw	cm3	28.428	28.428	0.000
Water, well, in ground, RNA	Raw	cm3	162.398	162.398	0.000
Water, well, in ground, RoW	Raw	cu.in	189.738	189.738	0.000
Water, well, in ground, RU	Raw	cm3	103.582	103.582	0.000
Water, well, in ground, SE	Raw	mm3	9.679	9.679	0.000
Water, well, in ground, SK	Raw	mm3	0.115	0.115	0.000
Water, well, in ground, TN	Raw	mm3	133.739	133.739	0.000
Water, well, in ground, TR	Raw	mm3	0.522	0.522	0.000
Water, well, in ground, TW	Raw	mm3	6.079	6.079	0.000
Water, well, in ground, US	Raw	cu.in	746.061	731.697	14.363
Water, well, in ground, WEU	Raw	cm3	100.453	100.453	0.000
Water, well, in ground, ZA	Raw	cm3	37.171	37.171	0.000
Occupation, annual crop	Raw	cm2a	11.668	11.520	0.148
Occupation, annual crop, greenhouse	Raw	m2s	23.174	23.174	0.000
Occupation, annual crop, irrigated	Raw	m2s	389.361	389.361	0.000
Occupation, annual crop, irrigated, intensive	Raw	m2s	796.044	796.044	0.000
Occupation, annual crop, non-irrigated	Raw	m2a	1.062	1.062	0.000
Occupation, annual crop, non-irrigated, extensive	Raw	mm2a	107.488	107.488	0.000
Occupation, annual crop, non-irrigated, intensive	Raw	cm2a	11.914	11.914	0.000
Occupation, arable land, unspecified use	Raw	m2s	0.000	0.000	0.000
Occupation, construction site	Raw	cm2a	806.290	21.140	785.150
Occupation, dump site	Raw	m2a	0.396	0.293	0.103
Occupation, dump site, benthos	Raw	m2s	27.000	27.441	-0.441
Occupation, forest, extensive	Raw	mm2a	905.748	905.748	0.000
Occupation, forest, intensive	Raw	m2a	0.213	0.212	0.001
Occupation, forest, intensive, normal	Raw	m2a	14.814	14.813	0.001
Occupation, forest, intensive, short-cycle	Raw	m2a	0.676	0.676	0.000
Occupation, grassland, natural (non-use)	Raw	m2s	43.899	43.899	0.000
Occupation, industrial area	Raw	cm2a	201.733	207.230	-5.497
Occupation, industrial area, benthos	Raw	m2s	0.247	0.251	-0.004
Occupation, industrial area, built up	Raw	mm2a	284.565	284.620	-0.056
Occupation, industrial area, vegetation	Raw	mm2a	59.945	58.820	1.126
Occupation, inland waterbody, unspecified	Raw	m2s	31.992	31.992	0.000
Occupation, mineral extraction site	Raw	m2a	0.119	0.080	0.039
Occupation, pasture, man made, extensive	Raw	m2s	52.706	52.706	0.000
Occupation, pasture, man made, intensive	Raw	mm2a	121.107	121.107	0.000
Occupation, permanent crop	Raw	mm2a	43.170	43.170	0.000
Occupation, permanent crop, fruit, intensive	Raw	m2a	1.583	1.583	0.000
Occupation, permanent crop, irrigated	Raw	mm2a	270.360	270.360	0.000
Occupation, permanent crop, irrigated, intensive	Raw	m2s	266.571	266.571	0.000
Occupation, permanent crop, non-irrigated, intensive	Raw	m2s	34.484	34.484	0.000
Occupation, seabed, drilling and mining	Raw	m2s	0.169	0.169	0.000
Occupation, seabed, infrastructure	Raw	m2s	0.990	0.990	0.000
Occupation, shrub land, sclerophyllous	Raw	cm2a	801.251	5.172	796.078

Occupation, traffic area, rail network	Raw	m2s	136.128	137.043	-0.915
Occupation, traffic area, rail/road embankment	Raw	cm2a	55.313	55.313	0.000
Occupation, traffic area, road embankment	Raw	m2a	0.146	0.146	0.000
Occupation, traffic area, road network	Raw	cm2a	174.307	174.308	-0.002
Occupation, urban, discontinuously built	Raw	m2s	85.768	85.768	0.000
Occupation, urban/industrial fallow (non-use)	Raw	m2s	16.875	16.875	0.000
Occupation, water bodies, artificial	Raw	cm2a	680.916	607.988	72.928
Occupation, water courses, artificial	Raw	cm2a	204.658	208.288	-3.631
Transformation, from annual crop	Raw	cm2	12.435	12.285	0.151
Transformation, from annual crop, greenhouse	Raw	mm2	1.694	1.694	0.000
Transformation, from annual crop, irrigated, intensive	Raw	mm2	28.641	28.641	0.000
Transformation, from annual crop, non-irrigated	Raw	m2	1.096	1.096	0.000
Transformation, from annual crop, non-irrigated, extensive	Raw	mm2	162.934	162.934	0.000
Transformation, from annual crop, non-irrigated, fallow	Raw	mm2	0.328	0.239	0.088
Transformation, from annual crop, non-irrigated, intensive	Raw	mm2	481.926	481.926	0.000
Transformation, from cropland fallow (non-use)	Raw	mm2	1.308	1.308	0.000
Transformation, from dump site, inert material landfill	Raw	mm2	273.945	0.287	273.658
Transformation, from dump site, residual material landfill	Raw	mm2	83.617	73.262	10.355
Transformation, from dump site, sanitary landfill	Raw	cm2	156.607	0.240	156.367
Transformation, from dump site, slag compartment	Raw	mm2	6.589	5.758	0.832
Transformation, from forest, extensive	Raw	sq.in	212.865	212.843	0.023
Transformation, from forest, intensive	Raw	cm2	26.420	26.420	0.000
Transformation, from forest, intensive, clear-cutting	Raw	cm2	241.301	241.300	0.001
Transformation, from forest, primary (non-use)	Raw	mm2	16.876	16.876	0.000
Transformation, from forest, secondary (non-use)	Raw	mm2	5.597	5.597	0.000
Transformation, from forest, unspecified	Raw	mm2	53.778	53.744	0.033
Transformation, from grassland, natural (non-use)	Raw	mm2	2.045	2.045	0.000
Transformation, from heterogeneous, agricultural	Raw	mm2	0.000	0.000	0.000
Transformation, from industrial area	Raw	mm2	54.017	55.138	-1.121
Transformation, from industrial area, benthos	Raw	mm2	0.000	0.000	0.000
Transformation, from industrial area, built up	Raw	mm2	0.239	0.238	0.001
Transformation, from industrial area, vegetation	Raw	mm2	0.407	0.406	0.001
Transformation, from mineral extraction site	Raw	cm2	12.949	0.762	12.187
Transformation, from pasture, man made	Raw	cm2	162.590	3.394	159.195
Transformation, from pasture, man made, extensive	Raw	mm2	0.033	0.033	0.000
Transformation, from pasture, man made, intensive	Raw	mm2	132.834	132.834	0.000
Transformation, from permanent crop	Raw	mm2	3.262	3.262	0.000
Transformation, from permanent crop, irrigated	Raw	mm2	9.787	9.787	0.000
Transformation, from permanent crop, irrigated, intensive	Raw	mm2	7.388	7.388	0.000
Transformation, from permanent crop, non-irrigated, intensive	Raw	mm2	1.093	1.093	0.000
Transformation, from seabed, infrastructure	Raw	mm2	0.000	0.000	0.000
Transformation, from seabed, unspecified	Raw	mm2	1.058	1.072	-0.014
Transformation, from shrub land, sclerophyllous	Raw	cm2	17.936	2.803	15.133
Transformation, from traffic area, rail/road embankment	Raw	mm2	14.717	14.717	0.000
Transformation, from traffic area, road network	Raw	mm2	0.006	0.006	0.000
Transformation, from tropical rain forest	Raw	cm2	241.301	241.300	0.001
Transformation, from unknown	Raw	cm2	88.546	39.405	49.141
Transformation, from unspecified, natural	Raw	mm2	0.001	0.001	0.000
Transformation, from wetland, inland (non-use)	Raw	mm2	0.123	0.123	0.000
Transformation, to annual crop	Raw	cm2	10.689	10.536	0.153
Transformation, to annual crop, fallow	Raw	mm2	1.815	1.815	0.000
Transformation, to annual crop, greenhouse	Raw	mm2	1.694	1.694	0.000
Transformation, to annual crop, irrigated, extensive	Raw	mm2	1.511	1.511	0.000
Transformation, to annual crop, irrigated, intensive	Raw	mm2	56.927	56.927	0.000

Transformation, to annual crop, non-irrigated	Raw	m2	1.095	1.095	0.000
Transformation, to annual crop, non-irrigated, extensive	Raw	mm2	174.713	174.713	0.000
Transformation, to annual crop, non-irrigated, fallow	Raw	mm2	0.368	0.270	0.098
Transformation, to annual crop, non-irrigated, intensive	Raw	cm2	15.330	15.330	0.000
Transformation, to dump site	Raw	cm2	22.548	23.280	-0.731
Transformation, to dump site, benthos	Raw	mm2	0.856	0.870	-0.014
Transformation, to dump site, inert material landfill	Raw	mm2	273.945	0.287	273.658
Transformation, to dump site, residual material landfill	Raw	mm2	83.618	73.263	10.355
Transformation, to dump site, sanitary landfill	Raw	cm2	156.607	0.240	156.367
Transformation, to dump site, slag compartment	Raw	mm2	6.589	5.758	0.832
Transformation, to forest, extensive	Raw	mm2	9.501	9.501	0.000
Transformation, to forest, intensive	Raw	cm2	27.768	27.690	0.078
Transformation, to forest, intensive, clear-cutting	Raw	cm2	241.301	241.300	0.001
Transformation, to forest, intensive, normal	Raw	sq.in	176.337	176.327	0.010
Transformation, to forest, intensive, short-cycle	Raw	cm2	241.301	241.300	0.001
Transformation, to forest, secondary (non-use)	Raw	mm2	0.007	0.007	0.000
Transformation, to forest, unspecified	Raw	cm2	28.550	1.214	27.335
Transformation, to grassland, natural (non-use)	Raw	mm2	0.105	0.105	0.000
Transformation, to heterogeneous, agricultural	Raw	mm2	0.131	0.132	-0.001
Transformation, to industrial area	Raw	mm2	233.117	238.540	-5.423
Transformation, to industrial area, benthos	Raw	mm2	0.001	0.001	0.000
Transformation, to industrial area, built up	Raw	mm2	5.994	6.152	-0.158
Transformation, to industrial area, vegetation	Raw	mm2	0.842	0.831	0.012
Transformation, to inland waterbody, unspecified	Raw	mm2	0.010	0.010	0.000
Transformation, to mineral extraction site	Raw	cm2	52.052	10.910	41.142
Transformation, to pasture, man made	Raw	mm2	16.486	16.480	0.006
Transformation, to pasture, man made, extensive	Raw	mm2	0.033	0.033	0.000
Transformation, to pasture, man made, intensive	Raw	mm2	109.720	109.720	0.000
Transformation, to permanent crop	Raw	mm2	25.872	25.872	0.000
Transformation, to permanent crop, fruit, intensive	Raw	cm2	222.908	222.907	0.001
Transformation, to permanent crop, irrigated	Raw	mm2	9.787	9.787	0.000
Transformation, to permanent crop, irrigated, intensive	Raw	mm2	7.388	7.388	0.000
Transformation, to permanent crop, non-irrigated	Raw	mm2	0.007	0.007	0.000
Transformation, to permanent crop, non-irrigated, intensive	Raw	mm2	1.093	1.093	0.000
Transformation, to sea and ocean	Raw	mm2	0.000	0.000	0.000
Transformation, to seabed, drilling and mining	Raw	mm2	0.005	0.005	0.000
Transformation, to seabed, infrastructure	Raw	mm2	0.196	0.196	0.000
Transformation, to seabed, unspecified	Raw	mm2	0.000	0.000	0.000
Transformation, to shrub land, sclerophyllous	Raw	cm2	160.249	1.033	159.215
Transformation, to traffic area, rail network	Raw	mm2	0.010	0.010	0.000
Transformation, to traffic area, rail/road embankment	Raw	mm2	29.827	29.827	0.000
Transformation, to traffic area, road embankment	Raw	cm2	11.243	11.241	0.002
Transformation, to traffic area, road network	Raw	mm2	20.835	20.837	-0.002
Transformation, to unknown	Raw	mm2	69.307	70.316	-1.009
Transformation, to urban, discontinuously built	Raw	mm2	0.056	0.056	0.000
Transformation, to urban/industrial fallow	Raw	mm2	0.007	0.007	0.000
Transformation, to water bodies, artificial	Raw	cm2	13.537	4.645	8.893
Transformation, to water courses, artificial	Raw	mm2	253.318	257.812	-4.494
Transformation, to wetland, inland (non-use)	Raw	mm2	0.022	0.022	0.000
2-Chloroacetophenone	Air	ng	29.616	29.071	0.545
2-Propanol	Air	ng	143.437	143.437	0.000
5-methyl Chrysene	Air	ng	191.522	187.976	3.546
Acenaphthene	Air	µg	5.006	4.952	0.054
Acenaphthylene	Air	µg	2.189	2.149	0.040

Acetaldehyde	Air	g	1.424	1.424	0.000
Acetic acid	Air	mg	66.507	67.274	-0.767
Acetone	Air	µg	25.391	25.391	0.000
Acetophenone	Air	ng	63.463	62.295	1.168
Acrolein	Air	g	3.259	3.259	0.000
Aldehydes, unspecified	Air	g	1.236	1.010	0.225
Aluminium	Air	g	3.861	3.958	-0.097
Ammonia	Air	g	9.602	9.040	0.562
Ammonium chloride	Air	mg	25.924	25.452	0.472
Anthracene	Air	µg	1.828	1.794	0.034
Antimony	Air	mg	15.818	15.816	0.002
Argon-40	Air	g	6.430	6.430	0.000
Arsenic	Air	mg	22.298	22.231	0.067
Barium	Air	mg	3.583	3.583	0.000
Benzal chloride	Air	ng	-3.838	12.627	-16.465
Benzaldehyde	Air	µg	690.294	690.294	0.000
Benzene	Air	g	13.336	13.840	-0.504
Benzene, chloro-	Air	ng	93.079	91.366	1.713
Benzene, ethyl-	Air	mg	5.533	0.012	5.521
Benzene, hexachloro-	Air	µg	53.299	52.932	0.366
Benzo(a)anthracene	Air	ng	696.679	683.784	12.895
Benzo(a)pyrene	Air	µg	59.687	42.062	17.625
Benzo(b)fluoranthene	Air	pg	285.702	285.702	0.000
Benzo(b,j,k)fluoranthene	Air	ng	957.611	939.881	17.730
Benzo(g,h,i)perylene	Air	ng	235.070	230.718	4.352
Benzo(k)fluoranthene	Air	pg	206.613	206.613	0.000
Benzyl chloride	Air	µg	2.962	2.907	0.055
Beryllium	Air	mg	1.449	1.446	0.003
Biphenyl	Air	µg	14.800	14.526	0.274
Boron	Air	µg	26.027	26.030	-0.003
Bromine	Air	µg	26.677	26.680	-0.003
Bromoform	Air	ng	165.003	161.966	3.036
BTEX (Benzene, Toluene, Ethylbenzene, and Xylene), unspecified ratio	Air	mg	835.236	754.979	80.257
Butadiene	Air	mg	2.185	2.183	0.002
Butane	Air	mg	159.935	166.301	-6.367
Cadmium	Air	mg	4.726	4.710	0.016
Calcium	Air	µg	877.667	877.667	0.000
Carbon dioxide, biogenic	Air	kg	168.275	159.780	8.495
Carbon dioxide, fossil	Air	kg	197.687	179.663	18.024
Carbon dioxide, land transformation	Air	mg	29.498	29.498	0.000
Carbon disulfide	Air	ng	549.298	542.230	7.068
Carbon monoxide	Air	g	512.633	494.890	17.743
Carbon monoxide, biogenic	Air	µg	80.288	80.288	0.000
Carbon monoxide, fossil	Air	kg	1.155	1.014	0.141
Carbonyl sulfide	Air	µg	462.459	462.459	0.000
Chloride	Air	ng	678.490	667.482	11.008
Chlorine	Air	mg	642.478	642.498	-0.020
Chloroform	Air	µg	910.145	0.246	909.899
Chlorosulfonic acid	Air	ng	1.680	1.680	0.000
Chromium	Air	mg	26.272	26.133	0.139
Chromium VI	Air	µg	688.436	679.152	9.284
Chrysene	Air	ng	870.592	854.474	16.119
Cobalt	Air	mg	7.705	7.603	0.102
Copper	Air	mg	122.945	120.342	2.602

Cumene	Air	ng	22.394	22.106	0.288
Cyanide	Air	µg	10.563	10.428	0.136
Dibenz(a,h)anthracene	Air	pg	134.268	134.268	0.000
Dinitrogen monoxide	Air	g	4.299	4.156	0.143
Dioxin, 2,3,7,8 Tetrachlorodibenzo-p-	Air	mg	1.354	1.354	0.000
Ethane	Air	mg	248.820	258.239	-9.419
Ethane, 1,1,1-trichloro-, HCFC-140	Air	µg	2.919	2.398	0.521
Ethane, 1,1,1,2-tetrafluoro-, HFC-134a	Air	mg	5.989	3.955	2.034
Ethane, 1,1,2-trichloro-1,2,2-trifluoro-, CFC-113	Air	ng	577.924	577.924	0.000
Ethane, 1,2-dibromo-	Air	ng	5.077	4.984	0.093
Ethane, 1,2-dichloro-	Air	µg	732.859	0.166	732.693
Ethane, 2-chloro-1,1,1,2-tetrafluoro-, HCFC-124	Air	ng	577.924	577.924	0.000
Ethane, chloro-	Air	mg	11.502	0.000	11.502
Ethane, hexafluoro-, HFC-116	Air	µg	34.623	35.639	-1.016
Ethane, tetrachloro-	Air	mg	5.835	0.000	5.835
Ethanol	Air	ng	65.702	65.702	0.000
Ethene	Air	µg	7.061	7.061	0.000
Ethene, chloro-	Air	pg	-219.479	722.111	-941.590
Ethene, tetrachloro-	Air	µg	460.028	453.896	6.132
Ethylene oxide	Air	µg	1.042	1.040	0.001
Ethyne	Air	µg	22.716	22.967	-0.251
Fluoranthene	Air	µg	6.183	6.069	0.114
Fluorene	Air	µg	7.924	7.777	0.147
Fluoride	Air	µg	772.016	758.016	14.000
Fluorine	Air	ng	520.612	560.567	-39.954
Formaldehyde	Air	g	5.251	5.252	-0.001
Furan	Air	ng	40.975	40.438	0.536
Heat, waste	Air	MJ	219.971	193.225	26.746
Helium	Air	µg	9.084	9.084	0.000
Heptane	Air	µg	151.160	151.160	0.000
Hexane	Air	mg	136.896	142.349	-5.452
Hydrazine, methyl-	Air	ng	719.243	706.007	13.236
Hydrocarbons, aliphatic, alkanes, unspecified	Air	mg	587.114	584.175	2.939
Hydrocarbons, aliphatic, unsaturated	Air	µg	12.309	12.310	-0.001
Hydrocarbons, aromatic	Air	mg	229.148	227.736	1.413
Hydrocarbons, chlorinated	Air	µg	61.889	62.203	-0.314
Hydrocarbons, unspecified	Air	g	30.805	17.080	13.725
Hydrogen	Air	mg	2.913	2.909	0.004
Hydrogen chloride	Air	g	27.173	26.667	0.506
Hydrogen fluoride	Air	g	1.346	1.328	0.018
Hydrogen sulfide	Air	mg	27.275	492.913	-465.638
Indeno(1,2,3-cd)pyrene	Air	ng	531.108	521.276	9.833
Iodine	Air	µg	9.795	9.796	-0.001
Iron	Air	mg	20.144	19.844	0.300
Isophorone	Air	µg	2.454	2.409	0.045
Isoprene	Air	g	22.239	21.878	0.361
Kerosene	Air	mg	12.416	12.190	0.226
Lead	Air	mg	67.338	67.056	0.282
Lead-210	Air	mBq	4.082	4.083	-0.001
m-Xylene	Air	µg	493.938	493.938	0.000
Magnesium	Air	mg	95.651	94.362	1.290
Manganese	Air	g	1.309	1.309	0.000
Mercaptans, unspecified	Air	µg	881.593	865.741	15.852
Mercury	Air	mg	10.193	10.140	0.053

Metals, unspecified	Air	g	34.760	34.760	0.000
Methane	Air	g	886.586	196.253	690.333
Methane, biogenic	Air	mg	8.494	8.520	-0.026
Methane, bromo-, Halon 1001	Air	ng	676.057	667.366	8.691
Methane, chlorodifluoro-, HCFC-22	Air	pg	19.731	19.731	0.000
Methane, dichloro-, HCC-30	Air	mg	265.293	243.155	22.138
Methane, dichlorodifluoro-, CFC-12	Air	µg	3.506	2.863	0.644
Methane, fossil	Air	g	2.245	130.141	-127.896
Methane, monochloro-, R-40	Air	µg	2.242	2.201	0.041
Methane, tetrachloro-, CFC-10	Air	mg	37.017	36.567	0.450
Methane, tetrafluoro-, CFC-14	Air	µg	346.193	355.333	-9.141
Methanol	Air	mg	22.992	22.960	0.032
Methyl ethyl ketone	Air	µg	-7.757	11.693	-19.451
Methyl methacrylate	Air	ng	84.617	83.060	1.557
Molybdenum	Air	µg	924.737	924.737	0.000
Naphtalene	Air	ng	271.015	271.015	0.000
Naphthalene	Air	mg	79.257	79.234	0.023
Nickel	Air	mg	55.513	54.123	1.390
Nitrate	Air	µg	407.136	407.136	0.000
Nitrogen dioxide	Air	g	25.471	9.004	16.467
Nitrogen monoxide	Air	g	191.735	101.351	90.384
Nitrogen oxides	Air	kg	1.332	1.183	0.149
Nitrogen, atmospheric	Air	g	-0.136	1.514	-1.649
NMVOC, non-methane volatile organic compounds, unspecified origin	Air	g	-44.779	808.858	-853.637
o-Xylene	Air	µg	201.546	201.546	0.000
Organic acids	Air	kg	43.800	43.800	0.000
Organic substances, unspecified	Air	mg	53.980	52.981	0.999
Ozone	Air	mg	16.963	16.967	-0.004
PAH, polycyclic aromatic hydrocarbons	Air	mg	15.852	14.003	1.849
Particulates	Air	g	1.905	0.000	1.905
Particulates, < 10 um	Air	g	13.833	7.380	6.453
Particulates, < 2.5 um	Air	g	20.390	12.254	8.136
Particulates, > 10 um	Air	g	4.005	3.876	0.129
Particulates, > 2.5 um, and < 10um	Air	g	428.480	427.765	0.715
Particulates, unspecified	Air	g	36.265	34.436	1.829
Pentane	Air	mg	198.565	206.471	-7.907
Phenanthrene	Air	µg	23.536	23.101	0.435
Phenol	Air	µg	-0.260	8.595	-8.855
Phenol, 2,4-dichloro-	Air	ng	13.628	13.628	0.000
Phenol, pentachloro-	Air	ng	45.302	45.302	0.000
Phenols, unspecified	Air	mg	45.432	45.367	0.065
Phosphorus	Air	ng	764.280	767.062	-2.782
Phthalate, dioctyl-	Air	ng	308.852	303.168	5.684
Polonium-210	Air	mBq	7.459	7.460	-0.001
Polychlorinated biphenyls	Air	µg	81.305	80.750	0.556
Potassium	Air	µg	150.077	150.077	0.000
Potassium-40	Air	mBq	1.005	1.005	0.000
Propanal	Air	µg	1.606	1.585	0.021
Propane	Air	mg	121.759	126.606	-4.847
Propene	Air	mg	144.102	144.204	-0.102
Propionic acid	Air	mg	2.762	2.872	-0.110
Propylene oxide	Air	µg	10.915	10.918	-0.003
Pyrene	Air	µg	2.874	2.821	0.053
Radioactive species, unspecified	Air	kBq	493.358	484.227	9.131

Radionuclides (Including Radon)	Air	mg	694.291	681.648	12.643
Radium-226	Air	mBq	1.054	1.054	0.000
Radium-228	Air	µBq	322.315	322.356	-0.041
Radon-220	Air	mBq	21.803	21.805	-0.003
Radon-222	Air	mBq	12.290	12.292	-0.002
Scandium	Air	pg	326.875	326.875	0.000
Selenium	Air	mg	15.734	15.564	0.170
Silicon	Air	mg	6.612	6.612	0.000
Silver	Air	ng	34.410	34.410	0.000
Sodium	Air	µg	831.784	831.784	0.000
Strontium	Air	µg	54.283	54.284	0.000
Styrene	Air	µg	282.384	282.383	0.001
Sulfate	Air	mg	3.534	3.534	0.000
Sulfur dioxide	Air	g	327.071	328.149	-1.078
Sulfur hexafluoride	Air	µg	496.184	496.019	0.165
Sulfur monoxide	Air	g	97.713	82.282	15.432
Sulfur oxides	Air	g	24.009	23.695	0.314
Sulfur trioxide	Air	ng	63.165	63.165	0.000
Sulfuric acid	Air	ng	928.157	928.157	0.000
Sulfuric acid, dimethyl ester	Air	ng	203.080	199.343	3.737
t-Butyl methyl ether	Air	ng	148.080	145.354	2.725
Tar	Air	ng	763.115	750.734	12.381
Thallium	Air	ng	734.197	712.591	21.607
Thorium	Air	pg	945.963	945.963	0.000
Thorium-228	Air	µBq	169.706	169.728	-0.022
Thorium-232	Air	µBq	264.355	264.390	-0.034
Tin	Air	µg	663.771	663.960	-0.189
Titanium	Air	µg	446.251	445.928	0.323
TOC, Total Organic Carbon	Air	g	3.323	3.323	0.000
Toluene	Air	g	4.986	5.723	-0.738
Toluene, 2,4-dinitro-	Air	ng	1.185	1.163	0.022
Trichloroethane	Air	mg	4.421	0.000	4.421
Uranium	Air	ng	1.481	1.481	0.000
Uranium-238	Air	µBq	878.018	878.133	-0.115
Vanadium	Air	µg	192.475	191.581	0.894
Vinyl acetate	Air	ng	32.154	31.563	0.592
VOC, volatile organic compounds	Air	g	744.253	730.345	13.908
Water	Air	g	3.985	4.246	-0.261
Water/m3	Air	dm3	63.306	63.306	0.000
Xylene	Air	g	6.901	7.345	-0.444
Zinc	Air	mg	116.399	114.758	1.641
1-Butanol	Air	µg	1.290	1.289	0.001
1-Pentanol	Air	mg	3.607	3.607	0.000
1-Pentene	Air	mg	2.726	2.726	0.000
1-Propanol	Air	mg	26.668	26.668	0.000
1,4-Butanediol	Air	µg	10.638	10.635	0.003
2-Aminopropanol	Air	ng	367.972	367.395	0.577
2-Butene, 2-methyl-	Air	ng	605.586	605.586	0.000
2-Methyl-1-propanol	Air	mg	6.208	6.208	0.000
2-Nitrobenzoic acid	Air	ng	583.526	582.192	1.335
2-Propanol	Air	µg	274.624	274.636	-0.013
Acenaphthene	Air	ng	1.497	1.562	-0.064
Acetaldehyde	Air	mg	86.608	86.597	0.012
Acetic acid	Air	mg	29.436	29.440	-0.004

Acetone	Air	mg	52.864	52.812	0.052
Acrolein	Air	mg	10.759	10.749	0.010
Acrylic acid	Air	ng	33.198	33.235	-0.036
Aldehydes, unspecified	Air	µg	309.915	298.780	11.135
Aluminium	Air	mg	109.934	98.784	11.149
Ammonia	Air	g	1.921	1.887	0.035
Ammonium carbonate	Air	µg	19.661	19.657	0.004
Aniline	Air	µg	18.190	18.166	0.025
Anthranilic acid	Air	ng	418.279	417.244	1.035
Antimony	Air	µg	23.853	22.570	1.283
Arsenic	Air	mg	2.149	2.119	0.029
Arsine	Air	pg	0.387	0.387	0.000
Barium	Air	mg	1.597	1.254	0.343
Benzaldehyde	Air	mg	5.613	5.608	0.005
Benzene	Air	g	1.508	1.503	0.005
Benzene, 1-methyl-2-nitro-	Air	ng	503.906	502.754	1.152
Benzene, 1,2-dichloro-	Air	mg	5.986	5.986	0.000
Benzene, ethyl-	Air	mg	251.129	250.122	1.007
Benzene, hexachloro-	Air	µg	6.746	6.688	0.059
Benzene, pentachloro-	Air	µg	16.919	16.772	0.147
Benzo(a)pyrene	Air	µg	474.010	474.111	-0.100
Beryllium	Air	µg	12.699	11.811	0.888
Boric acid	Air	pg	17.883	17.883	0.000
Boron	Air	mg	17.646	6.848	10.798
Boron trifluoride	Air	ng	119.828	119.828	0.000
Bromine	Air	mg	57.330	57.337	-0.007
Butadiene	Air	mg	2.325	2.325	0.000
Butane	Air	g	3.625	3.590	0.035
Butene	Air	mg	176.962	175.953	1.009
Butyrolactone	Air	µg	3.514	3.514	0.000
Cadmium	Air	mg	2.863	2.832	0.030
Calcium	Air	g	5.566	5.565	0.001
Carbon	Air	µg	7.546	7.546	0.000
Carbon dioxide, biogenic	Air	kg	103.526	103.435	0.092
Carbon dioxide, fossil	Air	kg	83.616	83.464	0.151
Carbon disulfide	Air	mg	9.661	9.661	0.000
Carbon monoxide, biogenic	Air	g	47.066	46.985	0.080
Carbon monoxide, fossil	Air	g	13.684	13.240	0.444
Chloramine	Air	mg	12.643	12.643	0.000
Chlorine	Air	mg	320.121	319.982	0.139
Chloroacetic acid	Air	µg	37.812	37.805	0.007
Chloroform	Air	µg	39.646	40.303	-0.658
Chlorosilane, trimethyl-	Air	ng	10.085	10.092	-0.007
Chlorosulfonic acid	Air	ng	302.310	301.669	0.641
Chromium	Air	mg	5.207	5.178	0.029
Chromium IV	Air	pg	13.048	13.048	0.000
Chromium VI	Air	µg	78.057	75.979	2.077
Cobalt	Air	mg	2.346	2.317	0.029
Copper	Air	mg	26.019	25.970	0.049
Cumene	Air	mg	18.908	18.730	0.178
Cyanide	Air	mg	18.064	17.075	0.989
Cyanoacetic acid	Air	ng	247.574	247.050	0.525
Cyclohexane	Air	ng	468.604	468.604	0.000
Diethyl ether	Air	ng	1.647	1.647	0.000

Diethylamine	Air	µg	8.301	8.290	0.011
Diethylene glycol	Air	ng	1.265	1.265	0.000
Dimethyl malonate	Air	ng	310.463	309.805	0.658
Dimethylamine	Air	ng	6.186	6.186	0.000
Dinitrogen monoxide	Air	g	3.492	3.401	0.091
Dioxin, 2,3,7,8 Tetrachlorodibenzo-p-	Air	ng	82.316	81.813	0.503
Dipropylamine	Air	µg	5.084	5.078	0.007
Ethane	Air	mg	832.484	867.014	-34.530
Ethane, 1,1-difluoro-, HFC-152a	Air	µg	38.664	38.664	0.000
Ethane, 1,1,1,2-tetrafluoro-, HFC-134a	Air	µg	3.599	3.599	0.000
Ethane, 1,1,2-trichloro-1,2,2-trifluoro-, CFC-113	Air	ng	1.576	1.577	-0.002
Ethane, 1,2-dichloro-	Air	mg	5.917	5.726	0.190
Ethane, hexafluoro-, HFC-116	Air	ng	114.952	115.072	-0.120
Ethanol	Air	mg	45.862	45.849	0.013
Ethene	Air	mg	703.561	699.181	4.380
Ethene, chloro-	Air	µg	317.251	182.113	135.138
Ethene, tetrachloro-	Air	ng	798.526	798.526	0.000
Ethyl acetate	Air	mg	2.116	2.116	0.000
Ethyl cellulose	Air	µg	2.278	2.278	0.000
Ethylamine	Air	mg	3.178	3.178	0.000
Ethylene diamine	Air	mg	2.951	2.951	0.000
Ethylene oxide	Air	mg	36.788	36.788	0.000
Ethyne	Air	mg	14.325	13.963	0.362
Fluorine	Air	mg	47.341	47.352	-0.011
Fluosilicic acid	Air	µg	67.514	68.701	-1.187
Formaldehyde	Air	mg	142.427	142.378	0.049
Formamide	Air	mg	6.597	6.597	0.000
Formic acid	Air	mg	1.917	1.917	0.000
Heat, waste	Air	MMBTU	2.170	2.172	-0.002
Heptane	Air	mg	816.728	807.471	9.256
Hexane	Air	g	3.422	3.401	0.021
Hydrocarbons, aliphatic, alkanes, cyclic	Air	mg	15.588	19.871	-4.283
Hydrocarbons, aliphatic, alkanes, unspecified	Air	g	4.911	4.909	0.002
Hydrocarbons, aliphatic, unsaturated	Air	g	3.631	3.631	0.000
Hydrocarbons, aromatic	Air	mg	728.536	724.563	3.973
Hydrocarbons, chlorinated	Air	mg	18.516	18.516	0.000
Hydrogen	Air	mg	204.800	203.404	1.396
Hydrogen chloride	Air	mg	634.202	601.594	32.607
Hydrogen fluoride	Air	mg	33.991	32.886	1.105
Hydrogen peroxide	Air	µg	2.268	2.268	0.000
Hydrogen sulfide	Air	µg	165.215	159.332	5.883
Iodine	Air	µg	325.202	317.531	7.670
Iron	Air	mg	56.718	53.393	3.325
Isocyanic acid	Air	µg	585.790	585.791	-0.001
Isopropylamine	Air	ng	588.187	587.169	1.017
Lactic acid	Air	µg	3.983	3.978	0.005
Lead	Air	mg	29.330	29.230	0.100
Lead-210	Air	mBq	548.534	515.868	32.666
Lithium	Air	ng	1.289	1.289	0.000
m-Xylene	Air	mg	118.920	118.947	-0.026
Magnesium	Air	mg	381.753	377.790	3.963
Manganese	Air	mg	161.267	161.290	-0.023
Mercury	Air	mg	1.080	1.075	0.006
Methane	Air	µg	22.301	22.301	0.000

Methane, biogenic	Air	mg	705.594	485.005	220.589
Methane, bromo-, Halon 1001	Air	ng	25.470	25.470	0.000
Methane, bromotrifluoro-, Halon 1301	Air	ng	1.630	1.630	0.000
Methane, chlorodifluoro-, HCFC-22	Air	µg	46.912	46.912	0.000
Methane, dichloro-, HCC-30	Air	mg	10.760	10.759	0.000
Methane, dichlorodifluoro-, CFC-12	Air	µg	364.608	364.609	0.000
Methane, dichlorofluoro-, HCFC-21	Air	ng	9.754	9.754	0.000
Methane, fossil	Air	g	11.644	11.947	-0.303
Methane, monochloro-, R-40	Air	pg	13.980	14.105	-0.125
Methane, tetrachloro-, CFC-10	Air	µg	219.104	216.381	2.724
Methane, tetrafluoro-, CFC-14	Air	ng	13.289	13.291	-0.002
Methane, trichlorofluoro-, CFC-11	Air	ng	15.619	15.619	0.000
Methane, trifluoro-, HFC-23	Air	µg	3.104	3.104	0.000
Methanesulfonic acid	Air	ng	250.182	249.652	0.530
Methanol	Air	mg	26.365	26.348	0.016
Methyl acetate	Air	ng	135.123	134.813	0.309
Methyl acrylate	Air	ng	37.667	37.709	-0.041
Methyl borate	Air	mg	1.336	1.336	0.000
Methyl ethyl ketone	Air	mg	2.092	2.092	0.000
Methyl formate	Air	mg	1.744	1.744	0.000
Methyl lactate	Air	µg	4.372	4.367	0.006
Methylamine	Air	µg	8.959	8.958	0.001
Molybdenum	Air	mg	1.170	1.151	0.019
Monoethanolamine	Air	µg	199.401	200.266	-0.865
Nickel	Air	mg	32.143	31.817	0.325
Nitrate	Air	µg	116.901	121.264	-4.363
Nitrobenzene	Air	µg	24.985	24.951	0.034
Nitrogen fluoride	Air	pg	349.976	349.976	0.000
Nitrogen oxides	Air	g	149.647	149.563	0.084
NMVOC, non-methane volatile organic compounds, unspecified origin	Air	g	4.228	3.904	0.324
o-Xylene	Air	ng	759.795	759.795	0.000
Organic carbon	Air	µg	18.767	18.767	0.000
Ozone	Air	µg	61.938	53.556	8.382
PAH, polycyclic aromatic hydrocarbons	Air	mg	11.062	11.067	-0.005
Paraffins	Air	µg	8.151	8.151	0.000
Particulates, < 2.5 um	Air	g	47.546	47.502	0.044
Particulates, > 10 um	Air	g	1.714	1.684	0.030
Particulates, > 2.5 um, and < 10um	Air	mg	911.900	882.171	29.729
Pentane	Air	g	4.499	4.445	0.054
Pentane, 3-methyl-	Air	µg	6.582	6.582	0.000
Phenol	Air	mg	10.941	10.823	0.118
Phenol, 2,4-dichloro-	Air	µg	3.682	3.680	0.001
Phenol, pentachloro-	Air	µg	9.519	9.505	0.014
Phosphine	Air	ng	817.162	817.162	0.000
Phosphoric acid	Air	pg	633.076	633.076	0.000
Phosphorus	Air	mg	286.702	286.504	0.198
Phosphorus trichloride	Air	µg	4.314	4.314	0.000
Platinum	Air	pg	12.725	12.725	-0.001
Polonium-210	Air	Bq	1.003	0.944	0.060
Polychlorinated biphenyls	Air	ng	48.643	48.643	0.000
Potassium	Air	g	22.168	22.172	-0.004
Potassium-40	Air	mBq	155.450	145.959	9.490
Propanal	Air	mg	22.549	22.544	0.005
Propane	Air	g	3.462	3.436	0.026

Propene	Air	mg	199.690	197.162	2.527
Propionic acid	Air	µg	226.088	231.420	-5.332
Propylamine	Air	mg	2.089	2.089	0.000
Propylene oxide	Air	mg	5.724	5.722	0.002
Radioactive species, other beta emitters	Air	Bq	54.974	54.981	-0.007
Radium-226	Air	mBq	141.684	133.254	8.430
Radium-228	Air	mBq	650.502	604.635	45.867
Radon-220	Air	mBq	482.410	482.543	-0.133
Radon-222	Air	mBq	275.963	275.729	0.234
Scandium	Air	µg	12.479	11.590	0.889
Selenium	Air	mg	1.025	1.007	0.018
Silicon	Air	mg	169.202	146.761	22.441
Silicon tetrachloride	Air	µg	10.798	10.798	0.000
Silver	Air	ng	43.895	43.884	0.011
Sodium	Air	g	1.292	1.291	0.001
Sodium chlorate	Air	µg	27.497	27.792	-0.296
Sodium dichromate	Air	µg	9.128	9.039	0.089
Sodium formate	Air	µg	1.392	1.340	0.051
Sodium hydroxide	Air	µg	9.554	9.555	0.000
Sodium tetrahydroborate	Air	ng	232.349	232.349	0.000
Strontium	Air	mg	1.961	1.827	0.134
Styrene	Air	µg	13.796	13.732	0.065
Sulfate	Air	mg	268.089	271.496	-3.407
Sulfur dioxide	Air	g	108.170	106.967	1.203
Sulfur hexafluoride	Air	ng	1.400	1.400	0.000
Sulfur trioxide	Air	µg	194.303	194.041	0.262
Sulfuric acid	Air	µg	1.640	1.640	0.000
t-Butyl methyl ether	Air	mg	336.140	336.131	0.009
t-Butylamine	Air	ng	578.817	577.820	0.997
Tetramethyl ammonium hydroxide	Air	µg	8.393	8.393	0.000
Thallium	Air	µg	15.665	14.540	1.125
Thorium	Air	µg	18.808	17.466	1.341
Thorium-228	Air	mBq	58.111	54.236	3.876
Thorium-232	Air	mBq	40.381	37.920	2.460
Tin	Air	µg	15.420	14.615	0.805
Titanium	Air	mg	3.773	3.504	0.269
Toluene	Air	g	1.166	1.160	0.006
Toluene, 2-chloro-	Air	µg	8.091	8.080	0.011
Trimethylamine	Air	ng	228.458	227.815	0.642
Uranium	Air	µg	25.041	23.256	1.786
Uranium-238	Air	mBq	118.021	110.997	7.025
Vanadium	Air	mg	62.922	62.137	0.785
Water	Air	ng	46.362	46.863	-0.501
Water/m3	Air	cm3	77.195	77.195	0.000
Xylene	Air	g	1.067	1.063	0.004
Zinc	Air	mg	288.887	288.906	-0.020
1-Propanol	Air	pg	1.306	1.306	0.000
2-Methyl-4-chlorophenoxyacetic acid	Air	ng	1.126	1.126	0.000
2-Propanol	Air	ng	20.702	20.702	0.000
2,4-D	Air	ng	176.262	176.262	0.000
2,4-D amines	Air	pg	557.364	557.364	0.000
2,4-D ester	Air	ng	6.507	6.507	0.000
4-Methyl-2-pentanone	Air	pg	452.435	452.435	0.000
Acenaphthene	Air	µg	3.793	3.956	-0.163

Acephate	Air	ng	18.736	18.736	0.000
Acetaldehyde	Air	mg	95.752	95.751	0.001
Acetamide	Air	ng	4.612	4.612	0.000
Acetic acid	Air	mg	629.492	629.489	0.003
Acetone	Air	mg	130.518	130.548	-0.029
Acetonitrile	Air	mg	26.254	26.254	0.000
Acifluorfen	Air	ng	2.572	2.572	0.000
Acrolein	Air	mg	2.189	2.282	-0.093
Actinides, radioactive, unspecified	Air	Bq	15.355	16.015	-0.660
Aerosols, radioactive, unspecified	Air	mBq	615.465	641.701	-26.236
Alachlor	Air	ng	18.201	18.201	0.000
Aldehydes, unspecified	Air	mg	7.408	7.726	-0.318
Aluminium	Air	mg	1.621	0.879	0.743
Ammonia	Air	g	1.555	1.557	-0.003
Antimony	Air	µg	197.197	202.251	-5.055
Antimony-124	Air	nBq	374.662	376.500	-1.839
Antimony-125	Air	µBq	6.133	6.152	-0.019
Argon-41	Air	mBq	750.818	751.711	-0.894
Arsenic	Air	mg	6.010	5.908	0.102
Atrazine	Air	ng	19.647	19.647	0.000
Azoxystrobin	Air	ng	8.511	8.511	0.000
Barium	Air	µg	916.822	848.437	68.385
Barium-140	Air	µBq	215.507	216.755	-1.248
Bentazone	Air	ng	8.012	8.012	0.000
Benzaldehyde	Air	µg	9.927	9.927	0.000
Benzene	Air	mg	828.490	829.469	-0.978
Benzene, ethyl-	Air	µg	700.613	730.635	-30.022
Benzene, hexachloro-	Air	pg	0.000	0.000	0.000
Benzo(a)pyrene	Air	mg	5.366	5.371	-0.005
Beryllium	Air	µg	166.609	172.896	-6.287
Boron	Air	mg	21.998	22.439	-0.442
Bromine	Air	mg	4.921	4.349	0.572
Bromoxynil	Air	pg	634.152	634.152	0.000
Butadiene	Air	ng	7.639	7.631	0.007
Butane	Air	mg	68.335	88.151	-19.816
Butyric acid, 4-(2,4-dichlorophenoxy)-	Air	ng	3.878	3.878	0.000
Cadmium	Air	µg	470.398	463.592	6.807
Calcium	Air	mg	2.584	0.641	1.943
Carbaryl	Air	ng	2.395	2.395	0.000
Carbon-14	Air	Bq	34.530	35.052	-0.522
Carbon dioxide, biogenic	Air	kg	3.366	0.043	3.323
Carbon dioxide, fossil	Air	kg	48.325	49.617	-1.292
Carbon dioxide, land transformation	Air	g	381.248	381.283	-0.035
Carbon disulfide	Air	mg	462.338	462.341	-0.003
Carbon monoxide, biogenic	Air	mg	218.601	29.816	188.785
Carbon monoxide, fossil	Air	g	52.280	52.244	0.036
Carbon monoxide, land transformation	Air	mg	11.652	11.652	0.000
Carfentrazone-ethyl	Air	pg	236.096	236.096	0.000
Cerium-141	Air	µBq	52.234	52.537	-0.303
Cesium-134	Air	µBq	2.502	2.516	-0.014
Cesium-137	Air	µBq	45.224	45.481	-0.257
Chlorimuron-ethyl	Air	ng	4.296	4.296	0.000
Chlorinated solvents, unspecified	Air	µg	1.785	1.785	0.000
Chlorine	Air	µg	105.002	109.415	-4.413

Chloroform	Air	µg	727.308	758.593	-31.286
Chlorpyrifos	Air	ng	85.694	85.694	0.000
Chromium	Air	mg	410.904	370.839	40.065
Chromium-51	Air	µBq	3.347	3.367	-0.019
Chromium VI	Air	mg	10.807	9.830	0.978
Clethodim	Air	ng	12.709	12.709	0.000
Cloransulam-methyl	Air	ng	2.237	2.237	0.000
Cobalt	Air	mg	6.280	5.849	0.432
Cobalt-58	Air	µBq	6.638	6.665	-0.027
Cobalt-60	Air	µBq	50.301	50.539	-0.239
Copper	Air	mg	18.843	17.319	1.524
Cumene	Air	µg	40.406	42.144	-1.738
Cyanide	Air	mg	69.421	69.777	-0.357
Cyfluthrin	Air	pg	448.476	448.476	0.000
Cyhalothrin, gamma-	Air	ng	5.147	5.147	0.000
Cypermethrin	Air	ng	1.088	1.088	0.000
Dicamba	Air	ng	15.113	15.113	0.000
Dichlorprop	Air	pg	798.353	798.353	0.000
Diflubenzuron	Air	pg	236.096	236.096	0.000
Dimethenamid	Air	pg	855.941	855.941	0.000
Dinitrogen monoxide	Air	g	2.008	2.041	-0.033
Dioxin, 2,3,7,8 Tetrachlorodibenzo-p-	Air	ng	8.451	8.531	-0.080
Esfenvalerate	Air	ng	2.682	2.682	0.000
Ethane	Air	mg	566.239	726.639	-160.400
Ethane, 1,1-difluoro-, HFC-152a	Air	µg	4.116	4.116	0.000
Ethane, 1,1,1-trichloro-, HCFC-140	Air	µg	148.402	154.785	-6.384
Ethane, 1,1,1,2-tetrafluoro-, HFC-134a	Air	µg	85.632	88.946	-3.314
Ethane, 1,2-dichloro-	Air	µg	296.429	309.181	-12.751
Ethane, 1,2-dichloro-1,1,2,2-tetrafluoro-, CFC-114	Air	mg	1.145	1.192	-0.047
Ethanol	Air	mg	7.950	7.966	-0.017
Ethene	Air	mg	285.077	284.644	0.433
Ethene, tetrachloro-	Air	µg	318.838	332.553	-13.715
Ethephon	Air	pg	0.040	0.040	0.000
Ethylene oxide	Air	ng	73.839	73.767	0.072
Ethyne	Air	mg	58.698	58.684	0.014
Fenoxaprop	Air	ng	3.511	3.511	0.000
Fluazifop-p-butyl	Air	ng	5.038	5.038	0.000
Flufenacet	Air	ng	1.889	1.889	0.000
Flumetsulam	Air	pg	441.929	441.929	0.000
Flumiclorac-pentyl	Air	pg	756.189	756.189	0.000
Flumioxazin	Air	ng	7.649	7.649	0.000
Fluorine	Air	mg	3.664	3.517	0.147
Fomesafen	Air	ng	28.440	28.440	0.000
Formaldehyde	Air	mg	160.517	160.600	-0.083
Formic acid	Air	mg	175.588	175.587	0.001
Furan	Air	mg	50.362	50.361	0.000
Glyphosate	Air	µg	5.695	5.695	0.000
Heat, waste	Air	MJ	424.038	414.404	9.633
Helium	Air	mg	227.731	225.571	2.160
Hexane	Air	mg	17.677	18.021	-0.344
Hydrocarbons, aliphatic, alkanes, cyclic	Air	mg	4.298	4.483	-0.185
Hydrocarbons, aliphatic, alkanes, unspecified	Air	mg	18.238	18.354	-0.116
Hydrocarbons, aliphatic, unsaturated	Air	mg	3.225	3.238	-0.013
Hydrocarbons, aromatic	Air	mg	5.218	5.161	0.057

Hydrocarbons, chlorinated	Air	mg	1.506	1.571	-0.065
Hydrocarbons, unspecified	Air	µg	7.327	7.327	0.000
Hydrogen-3, Tritium	Air	kBq	5.623	5.861	-0.238
Hydrogen chloride	Air	g	9.642	9.586	0.056
Hydrogen fluoride	Air	g	1.296	1.201	0.095
Hydrogen sulfide	Air	mg	11.247	10.911	0.336
Imazamox	Air	ng	1.131	1.131	0.000
Imazaquin	Air	ng	3.606	3.606	0.000
Imazethapyr	Air	ng	7.464	7.464	0.000
Iodine	Air	mg	2.315	2.321	-0.006
Iodine-129	Air	mBq	12.778	13.072	-0.294
Iodine-131	Air	mBq	741.801	766.033	-24.232
Iodine-133	Air	Bq	2.299	2.397	-0.098
Iodine-135	Air	Bq	4.985	5.198	-0.213
Iron	Air	mg	5.015	4.511	0.504
Isoprene	Air	mg	2.314	2.314	0.000
Krypton-85	Air	Bq	2.473	2.477	-0.004
Krypton-85m	Air	Bq	4.314	4.332	-0.018
Krypton-87	Air	mBq	705.207	709.199	-3.992
Krypton-88	Air	mBq	925.908	931.187	-5.279
Krypton-89	Air	mBq	389.321	391.570	-2.248
Lactofen	Air	ng	3.632	3.632	0.000
Lambda-cyhalothrin	Air	pg	0.001	0.001	0.000
Lanthanum-140	Air	µBq	18.415	18.522	-0.107
Lead	Air	mg	18.242	17.196	1.046
Lead-210	Air	Bq	6.220	6.452	-0.232
m-Xylene	Air	ng	29.628	29.628	0.000
Magnesium	Air	mg	84.581	85.523	-0.942
Manganese	Air	mg	7.848	7.820	0.028
Manganese-54	Air	µBq	1.714	1.724	-0.010
MCPB	Air	ng	1.096	1.096	0.000
Mercury	Air	mg	1.406	1.406	0.000
Methane, biogenic	Air	g	512.546	5.495	507.051
Methane, bromochlorodifluoro-, Halon 1211	Air	µg	-86.468	18.921	-105.389
Methane, bromotrifluoro-, Halon 1301	Air	mg	2.324	2.297	0.027
Methane, chlorodifluoro-, HCFC-22	Air	mg	1.970	2.298	-0.329
Methane, dichloro-, HCC-30	Air	mg	2.153	2.245	-0.093
Methane, dichlorodifluoro-, CFC-12	Air	ng	170.940	168.985	1.955
Methane, fossil	Air	g	233.376	213.778	19.598
Methane, land transformation	Air	µg	832.228	832.228	0.000
Methane, monochloro-, R-40	Air	mg	3.930	4.100	-0.169
Methanol	Air	mg	486.490	486.466	0.024
Methomyl	Air	pg	0.136	0.136	0.000
Methyl ethyl ketone	Air	ng	5.422	5.422	0.000
Metolachlor	Air	ng	61.595	61.595	0.000
Metribuzin	Air	ng	23.555	23.555	0.000
Molybdenum	Air	µg	36.001	35.798	0.203
Nickel	Air	mg	19.839	19.298	0.541
Niobium-95	Air	mBq	827.872	827.872	0.000
Nitrate	Air	mg	1.090	1.135	-0.046
Nitrogen oxides	Air	g	135.824	137.652	-1.828
NMVOC, non-methane volatile organic compounds, unspecified origin	Air	g	90.508	89.698	0.810
Noble gases, radioactive, unspecified	Air	kBq	140.304	143.874	-3.570
Ozone	Air	mg	341.309	340.926	0.383

PAH, polycyclic aromatic hydrocarbons	Air	mg	8.892	9.148	-0.256
Paraquat	Air	ng	15.153	15.153	0.000
Parathion, methyl	Air	ng	2.908	2.908	0.000
Particulates, < 2.5 um	Air	g	18.934	18.480	0.454
Particulates, > 10 um	Air	g	59.342	60.664	-1.323
Particulates, > 2.5 um, and < 10um	Air	g	16.376	16.076	0.300
Pendimethalin	Air	ng	164.368	164.368	0.000
Pentane	Air	mg	16.523	16.541	-0.018
Permethrin	Air	ng	2.372	2.372	0.000
Phenol	Air	µg	941.801	946.902	-5.101
Phenol, pentachloro-	Air	mg	2.362	2.364	-0.002
Phosphorus	Air	µg	71.319	71.916	-0.597
Platinum	Air	pg	791.450	791.742	-0.292
Plutonium-238	Air	nBq	1.743	1.783	-0.040
Plutonium-alpha	Air	nBq	3.996	4.088	-0.092
Polonium-210	Air	Bq	7.279	7.529	-0.250
Potassium	Air	mg	2.913	0.262	2.651
Potassium-40	Air	Bq	6.589	6.864	-0.275
Propanal	Air	µg	2.684	2.684	0.000
Propane	Air	mg	274.226	324.511	-50.285
Propene	Air	mg	198.517	198.491	0.026
Propiconazole	Air	ng	2.788	2.788	0.000
Propionic acid	Air	µg	190.086	190.086	0.000
Protactinium-234	Air	Bq	1.039	1.084	-0.045
Prothioconazol	Air	pg	0.003	0.003	0.000
Pyraclostrobin (prop)	Air	ng	6.563	6.563	0.000
Quizalofop ethyl ester	Air	pg	880.584	880.584	0.000
Radioactive species, other beta emitters	Air	µBq	44.123	44.202	-0.079
Radium-226	Air	Bq	5.453	5.672	-0.219
Radium-228	Air	mBq	924.275	961.325	-37.050
Radon-220	Air	Bq	138.116	143.849	-5.733
Radon-222	Air	kBq	339.954	354.116	-14.162
Ruthenium-103	Air	nBq	44.694	44.953	-0.259
Scandium	Air	µg	2.629	2.696	-0.067
Selenium	Air	mg	9.999	10.413	-0.413
Sethoxydim	Air	ng	1.895	1.895	0.000
Silicon	Air	mg	5.512	4.015	1.496
Silicon tetrafluoride	Air	µg	6.118	6.106	0.012
Silver	Air	ng	230.629	230.746	-0.117
Silver-110	Air	nBq	820.339	822.906	-2.567
Sodium	Air	mg	7.834	1.358	6.476
Strontium	Air	µg	833.212	832.130	1.082
Styrene	Air	µg	214.094	222.041	-7.947
Sulfate	Air	mg	8.587	8.949	-0.361
Sulfentrazone	Air	ng	18.125	18.125	0.000
Sulfur dioxide	Air	g	338.118	342.987	-4.870
Sulfur hexafluoride	Air	mg	10.028	10.020	0.008
Sulfuric acid	Air	µg	52.788	52.788	0.000
Tebuconazole	Air	pg	0.009	0.009	0.000
Tefluthrin	Air	pg	219.299	219.299	0.000
Terpenes	Air	mg	21.879	21.879	0.000
Thallium	Air	µg	1.100	1.092	0.008
Thifensulfuron	Air	pg	258.319	258.319	0.000
Thiodicarb	Air	pg	920.594	920.594	0.000

Thorium	Air	ng	191.920	156.561	35.359
Thorium-228	Air	mBq	604.051	628.583	-24.532
Thorium-230	Air	Bq	1.405	1.462	-0.057
Thorium-232	Air	mBq	624.847	649.403	-24.555
Thorium-234	Air	Bq	1.039	1.084	-0.045
Tin	Air	mg	2.826	2.580	0.246
Titanium	Air	µg	30.511	25.071	5.440
Toluene	Air	mg	49.148	49.162	-0.013
Trifloxystrobin	Air	pg	165.287	165.287	0.000
Trifluralin	Air	ng	261.047	261.047	0.000
Tungsten	Air	ng	326.870	340.617	-13.747
Uranium	Air	ng	109.017	91.040	17.978
Uranium-234	Air	Bq	3.159	3.291	-0.131
Uranium-235	Air	mBq	61.786	64.383	-2.597
Uranium-238	Air	Bq	3.336	3.468	-0.132
Uranium alpha	Air	Bq	5.919	6.167	-0.248
Vanadium	Air	mg	1.654	1.654	0.001
Water	Air	µg	480.960	480.474	0.487
Water/m3	Air	cu.in	73.244	73.244	0.000
Xenon-131m	Air	Bq	3.712	3.733	-0.021
Xenon-133	Air	Bq	208.179	208.948	-0.769
Xenon-133m	Air	mBq	143.627	144.350	-0.724
Xenon-135	Air	Bq	73.922	74.229	-0.308
Xenon-135m	Air	Bq	33.922	34.116	-0.194
Xenon-137	Air	Bq	1.065	1.071	-0.006
Xenon-138	Air	Bq	7.957	8.003	-0.046
Xylene	Air	mg	28.523	28.583	-0.059
Zinc	Air	mg	48.074	44.215	3.858
Zinc-65	Air	µBq	8.559	8.609	-0.050
Zirconium	Air	µg	2.192	1.756	0.436
Zirconium-95	Air	µBq	15.333	15.381	-0.048
Aluminium	Air	mg	369.242	384.771	-15.529
Ammonia	Air	µg	4.035	4.035	0.000
Antimony	Air	µg	33.292	34.692	-1.400
Arsenic	Air	mg	1.957	2.039	-0.082
Barium	Air	mg	2.139	2.229	-0.090
Beryllium	Air	µg	46.609	48.569	-1.960
Boron	Air	µg	620.447	646.541	-26.094
Cadmium	Air	µg	50.443	52.564	-2.121
Calcium	Air	mg	120.054	125.103	-5.049
Chlorine	Air	mg	4.580	4.773	-0.193
Chromium VI	Air	µg	238.090	248.103	-10.013
Cobalt	Air	µg	296.604	309.078	-12.474
Copper	Air	mg	3.127	3.259	-0.132
Dinitrogen monoxide	Air	µg	3.706	3.706	0.000
Dioxin, 2,3,7,8 Tetrachlorodibenzo-p-	Air	pg	0.025	0.025	0.000
Ethane, 1,1,2-trichloro-1,2,2-trifluoro-, CFC-113	Air	ng	695.380	695.380	0.000
Fluorine	Air	mg	22.498	23.444	-0.946
Hydrogen sulfide	Air	µg	687.563	687.563	0.000
Iron	Air	mg	401.525	418.412	-16.887
Lead	Air	mg	3.309	3.448	-0.139
Magnesium	Air	mg	36.823	38.372	-1.549
Manganese	Air	mg	8.303	8.652	-0.349
Mercury	Air	µg	25.423	26.492	-1.069

Molybdenum	Air	µg	642.642	669.669	-27.027
Nickel	Air	µg	677.952	706.464	-28.512
Nitrate	Air	mg	3.168	3.301	-0.133
Nitrogen oxides	Air	ng	678.050	678.050	0.000
Particulates, < 2.5 um	Air	mg	294.916	307.305	-12.389
Particulates, > 10 um	Air	mg	736.465	767.439	-30.973
Particulates, > 2.5 um, and < 10um	Air	mg	441.879	460.463	-18.584
Phosphorus	Air	µg	620.447	646.541	-26.094
Potassium	Air	mg	63.154	65.810	-2.656
Radon-222	Air	kBq	14124.069	14718.073	-594.004
Scandium	Air	mg	1.322	1.377	-0.056
Selenium	Air	µg	184.621	192.385	-7.764
Silicon	Air	mg	82.222	85.680	-3.458
Silver	Air	µg	55.285	57.610	-2.325
Sodium	Air	mg	21.690	22.603	-0.912
Strontium	Air	mg	1.342	1.398	-0.056
Sulfate	Air	mg	339.985	354.283	-14.299
Tin	Air	µg	76.976	80.213	-3.237
Titanium	Air	mg	24.112	25.126	-1.014
Tungsten	Air	µg	149.311	155.590	-6.279
Vanadium	Air	mg	2.290	2.386	-0.096
Zinc	Air	mg	2.371	2.471	-0.100
Benzene	Air	ng	48.226	48.178	0.048
Butadiene	Air	ng	45.688	45.643	0.045
Cadmium	Air	pg	24.174	24.150	0.024
Carbon dioxide, fossil	Air	mg	7.615	7.607	0.008
Carbon monoxide, fossil	Air	µg	8.944	8.935	0.009
Chromium	Air	pg	120.870	120.750	0.119
Copper	Air	ng	4.109	4.105	0.004
Dinitrogen monoxide	Air	ng	72.521	72.450	0.072
Ethylene oxide	Air	ng	441.645	441.209	0.436
Formaldehyde	Air	ng	380.749	380.373	0.376
Heat, waste	Air	J	107.490	107.382	0.109
Hydrogen chloride	Air	ng	2.079	2.077	0.002
Lead	Air	pg	48.348	48.301	0.048
Mercury	Air	pg	0.169	0.169	0.000
Methane, fossil	Air	ng	120.870	120.750	0.119
Nickel	Air	pg	169.215	169.048	0.167
Nitrogen oxides	Air	µg	124.471	124.438	0.033
NMVOC, non-methane volatile organic compounds, unspecified origin	Air	µg	1.622	1.620	0.002
Particulates, < 2.5 um	Air	ng	91.861	91.770	0.091
Selenium	Air	pg	24.174	24.150	0.024
Sulfur dioxide	Air	µg	2.417	2.415	0.002
Water	Air	mg	2.923	2.920	0.003
Water/m3	Air	mm3	0.075	0.075	0.000
Zinc	Air	ng	2.417	2.415	0.002
2-Hexanone	Water	µg	771.565	635.583	135.983
4-Methyl-2-pentanone	Water	µg	497.790	410.269	87.521
Acetone	Water	mg	1.184	0.976	0.208
Acidity, unspecified	Water	µg	60.029	60.029	0.000
Acids, unspecified	Water	µg	14.252	14.021	0.231
Allyl chloride	Water	ng	805.325	805.325	0.000
Aluminium	Water	g	10.039	8.241	1.797
Ammonia	Water	g	5.591	1.802	3.789

Ammonia, as N	Water	µg	7.157	7.041	0.116
Ammonium, ion	Water	mg	9.093	8.993	0.101
Antimony	Water	mg	6.143	5.022	1.121
AOX, Adsorbable Organic Halogen as Cl	Water	µg	180.757	180.717	0.040
Arsenic	Water	mg	32.701	26.887	5.813
Barium	Water	g	135.018	110.422	24.595
Benzene	Water	mg	198.713	163.771	34.942
Benzene, 1-methyl-4-(1-methylethyl)-	Water	µg	11.808	9.727	2.081
Benzene, ethyl-	Water	mg	11.188	9.213	1.976
Benzene, pentamethyl-	Water	µg	8.856	7.295	1.561
Benzenes, alkylated, unspecified	Water	mg	5.386	4.403	0.983
Benzoic acid	Water	mg	119.869	98.743	21.126
Beryllium	Water	mg	1.777	1.460	0.317
Biphenyl	Water	µg	348.715	285.064	63.650
BOD5, Biological Oxygen Demand	Water	kg	1.608	1.598	0.010
Borate	Water	ng	47.100	47.100	0.000
Boron	Water	mg	371.771	306.407	65.364
Bromide	Water	g	25.316	20.855	4.462
Bromine	Water	mg	61.199	61.199	0.000
Cadmium	Water	mg	5.146	4.285	0.862
Calcium	Water	g	380.526	313.625	66.901
Carbonate	Water	µg	1.611	1.611	0.000
Carboxylic acids, unspecified	Water	ng	2.606	2.606	0.000
Chloride	Water	kg	4.278	3.526	0.752
Chlorides, unspecified	Water	mg	32.076	32.076	0.000
Chlorine	Water	ng	498.157	498.157	0.000
Chloroform	Water	µg	185.630	0.000	185.630
Chromium	Water	mg	260.661	213.092	47.569
Chromium III	Water	mg	19.010	15.417	3.593
Chromium VI	Water	mg	1.366	1.164	0.202
Cobalt	Water	mg	2.624	2.163	0.461
COD, Chemical Oxygen Demand	Water	g	62.484	34.072	28.412
Copper	Water	mg	41.092	35.081	6.011
Cu-HDO	Water	pg	5.429	5.429	0.000
Cyanide	Water	mg	2.724	2.704	0.020
Decane	Water	mg	3.444	2.837	0.607
Detergent, oil	Water	mg	100.162	82.651	17.512
Dibenzofuran	Water	µg	22.468	18.508	3.960
Dibenzothiophene	Water	µg	19.280	15.876	3.405
Dichromate	Water	ng	41.769	41.769	0.000
DOC, Dissolved Organic Carbon	Water	mg	92.089	91.381	0.708
Docosane	Water	µg	126.444	104.159	22.285
Dodecane	Water	mg	6.535	5.383	1.152
Eicosane	Water	mg	1.799	1.482	0.317
Ethane, 1,2-dichloro-	Water	µg	19.086	0.000	19.086
Ethane, tetrachloro-	Water	µg	5.229	0.000	5.229
Ethanol	Water	pg	794.989	794.989	0.000
Ethene, chloro-	Water	µg	8.628	0.000	8.628
Fluorene, 1-methyl-	Water	µg	13.448	11.078	2.370
Fluorenes, alkylated, unspecified	Water	µg	312.126	255.154	56.972
Fluoride	Water	mg	93.585	91.937	1.648
Fluorine	Water	µg	154.392	126.275	28.117
Fluosilicic acid	Water	µg	6.848	6.848	0.000
Formaldehyde	Water	mg	17.933	17.929	0.004

Heat, waste	Water	kJ	76.511	76.164	0.347
Hexadecane	Water	mg	7.133	5.876	1.257
Hexanoic acid	Water	mg	24.824	20.449	4.375
Hydrocarbons, aliphatic, unsaturated	Water	pg	3.419	3.419	0.000
Hydrocarbons, unspecified	Water	µg	180.618	87.269	93.349
Hydrogen chloride	Water	mg	3.096	3.096	0.000
Hydroxide	Water	ng	164.153	164.153	0.000
Iron	Water	g	20.204	16.620	3.584
Lead	Water	mg	69.130	57.077	12.053
Lead-210	Water	mBq	82.619	82.619	0.000
Lead-210/kg	Water	pg	12.278	10.114	2.164
Lithium	Water	g	11.953	10.823	1.129
m-Xylene	Water	mg	3.589	2.958	0.631
Magnesium	Water	g	74.388	61.310	13.078
Manganese	Water	mg	276.199	252.470	23.729
Mercury	Water	µg	145.178	123.482	21.695
Metallic ions, unspecified	Water	ng	668.558	657.710	10.847
Metals (unspecified)	Water	µg	196.088	0.000	196.088
Methane, dichloro-, HCC-30	Water	µg	5.229	0.000	5.229
Methane, monochloro-, R-40	Water	µg	4.756	3.918	0.838
Methane, tetrachloro-, CFC-10	Water	µg	96.737	0.000	96.737
Methanol	Water	mg	5.380	5.379	0.001
Methyl ethyl ketone	Water	µg	9.512	7.836	1.676
Molybdenum	Water	mg	2.723	2.244	0.479
Monoethanolamine	Water	ng	19.546	19.546	0.000
n-Hexacosane	Water	µg	78.885	64.982	13.903
Naphthalene	Water	mg	2.153	1.773	0.379
Naphthalene, 2-methyl-	Water	mg	1.872	1.542	0.330
Naphthalenes, alkylated, unspecified	Water	µg	88.256	72.147	16.109
Nickel	Water	mg	33.296	27.617	5.679
Nitrate	Water	µg	2.557	2.557	0.000
Nitrate compounds	Water	ng	193.146	190.013	3.134
Nitric acid	Water	µg	433.235	426.206	7.029
Nitrite	Water	ng	4.564	4.564	0.000
Nitrogen	Water	µg	99.884	99.884	0.000
Nitrogen, total	Water	mg	13.798	13.547	0.251
o-Cresol	Water	mg	3.399	2.800	0.599
o-Xylene	Water	µg	6.300	6.300	0.000
Octadecane	Water	mg	1.762	1.452	0.311
Oils, unspecified	Water	g	2.777	2.297	0.481
p-Cresol	Water	mg	3.668	3.021	0.646
PAH, polycyclic aromatic hydrocarbons	Water	ng	593.288	593.288	0.000
Phenanthrene	Water	µg	32.022	26.243	5.779
Phenanthrenes, alkylated, unspecified	Water	µg	36.595	29.915	6.680
Phenol	Water	mg	49.777	40.959	8.818
Phenol, 2,4-dimethyl-	Water	mg	3.310	2.727	0.583
Phenols, unspecified	Water	mg	11.527	9.827	1.700
Phosphate	Water	mg	83.689	0.024	83.664
Phosphorus	Water	mg	1.805	1.804	0.000
Polychlorinated biphenyls	Water	pg	407.406	407.406	0.000
Potassium	Water	pg	328.803	328.803	0.000
Radioactive species, Nuclides, unspecified	Water	Bq	805.073	790.412	14.661
Radium-226	Water	mBq	377.997	377.997	0.000
Radium-226/kg	Water	ng	4.272	3.519	0.753

Radium-228	Water	mBq	531.895	531.895	0.000
Radium-228/kg	Water	pg	21.849	17.999	3.851
Selenium	Water	mg	3.141	2.879	0.262
Silver	Water	mg	248.810	205.024	43.787
Sodium	Water	kg	1.206	0.994	0.212
Solids, inorganic	Water	µg	64.386	64.368	0.018
Strontium	Water	g	6.457	5.322	1.135
Sulfate	Water	g	19.893	18.174	1.719
Sulfide	Water	mg	5.553	4.530	1.023
Sulfur	Water	mg	313.826	258.650	55.176
Suspended solids, unspecified	Water	kg	5.582	4.599	0.983
Tar	Water	ng	10.916	10.739	0.177
Tetradecane	Water	mg	2.864	2.359	0.505
Thallium	Water	mg	1.294	1.058	0.236
Tin	Water	mg	25.367	20.803	4.564
Titanium	Water	mg	94.679	77.470	17.209
TOC, Total Organic Carbon	Water	mg	93.216	92.508	0.708
Toluene	Water	mg	187.740	154.728	33.012
Trichloroethane	Water	µg	5.229	0.000	5.229
Triethylene glycol	Water	µg	1.671	1.671	0.000
Vanadium	Water	mg	3.216	2.651	0.566
VOC, volatile organic compounds, unspecified origin	Water	µg	9.025	9.025	0.000
Water, AT	Water	dm3	364.076	364.076	0.000
Water, AU	Water	dm3	100.421	100.421	0.000
Water, BA	Water	cu.in	308.369	308.369	0.000
Water, BE	Water	cu.in	395.468	395.468	0.000
Water, BG	Water	dm3	33.466	33.466	0.000
Water, BR	Water	dm3	562.104	562.104	0.000
Water, CA	Water	dm3	575.714	575.714	0.000
Water, CH	Water	dm3	350.122	350.122	0.000
Water, CL	Water	dm3	153.506	153.506	0.000
Water, CN	Water	m3	6.987	6.987	0.000
Water, CY	Water	cm3	47.214	47.214	0.000
Water, CZ	Water	fl. oz	904.879	904.879	0.000
Water, DE	Water	dm3	200.722	200.722	0.000
Water, DK	Water	cm3	342.812	342.812	0.000
Water, EE	Water	cm3	669.086	669.086	0.000
Water, ES	Water	dm3	139.111	139.111	0.000
Water, Europe without Switzerland	Water	cm3	118.749	118.749	0.000
Water, FI	Water	dm3	56.784	56.784	0.000
Water, FR	Water	dm3	561.620	561.620	0.000
Water, GB	Water	dm3	52.340	52.340	0.000
Water, GLO	Water	cu.in	824.742	824.742	0.000
Water, GR	Water	dm3	39.042	39.042	0.000
Water, HR	Water	cu.in	153.052	153.052	0.000
Water, HU	Water	cu.in	174.209	174.209	0.000
Water, IAI Area, Africa	Water	mm3	121.417	121.417	0.000
Water, IAI Area, Asia, without China and GCC	Water	mm3	220.799	220.799	0.000
Water, IAI Area, EU27 & EFTA	Water	mm3	924.098	924.098	0.000
Water, IAI Area, Gulf Cooperation Council	Water	mm3	267.191	267.191	0.000
Water, IAI Area, North America, without Quebec	Water	mm3	163.849	163.849	0.000
Water, IAI Area, Russia & RER w/o EU27 & EFTA	Water	mm3	357.554	357.554	0.000
Water, IAI Area, South America	Water	mm3	149.945	149.945	0.000
Water, ID	Water	fl. oz	681.821	681.821	0.000

Water, IE	Water	cu.in	449.808	449.808	0.000
Water, IL	Water	mm3	0.288	0.288	0.000
Water, IN	Water	dm3	136.012	136.012	0.000
Water, IR	Water	dm3	96.036	96.036	0.000
Water, IS	Water	fl. oz	738.203	738.203	0.000
Water, IT	Water	dm3	134.132	134.132	0.000
Water, JP	Water	dm3	463.721	463.721	0.000
Water, KR	Water	fl. oz	965.977	965.977	0.000
Water, LT	Water	cu.in	241.570	241.570	0.000
Water, LU	Water	cu.in	201.720	201.720	0.000
Water, LV	Water	dm3	31.633	31.633	0.000
Water, MA	Water	mm3	829.216	829.216	0.000
Water, MK	Water	cu.in	121.993	121.993	0.000
Water, MT	Water	cm3	37.336	37.336	0.000
Water, MX	Water	dm3	248.459	248.459	0.000
Water, MY	Water	fl. oz	867.325	867.325	0.000
Water, NL	Water	cu.in	136.813	136.813	0.000
Water, NO	Water	fl. oz	959.158	959.158	0.000
Water, NORDEL	Water	mm3	261.975	261.975	0.000
Water, PE	Water	cu.in	185.922	185.922	0.000
Water, PG	Water	mm3	813.840	813.840	0.000
Water, PH	Water	mm3	30.247	30.247	0.000
Water, PL	Water	dm3	30.103	30.103	0.000
Water, PT	Water	dm3	38.568	38.568	0.000
Water, RAF	Water	cm3	43.650	43.650	0.000
Water, RAS	Water	cm3	771.309	771.309	0.000
Water, RER	Water	cu.in	570.752	570.752	0.000
Water, RLA	Water	cm3	379.226	379.226	0.000
Water, RME	Water	cm3	429.227	429.227	0.000
Water, RNA	Water	cm3	964.109	964.109	0.000
Water, RO	Water	dm3	110.121	110.121	0.000
Water, RoW	Water	m3	61.179	61.179	0.000
Water, RS	Water	dm3	79.932	79.932	0.000
Water, RU	Water	dm3	834.218	834.218	0.000
Water, SA	Water	cu.in	221.662	221.662	0.000
Water, SE	Water	dm3	667.985	667.985	0.000
Water, SI	Water	dm3	47.288	47.288	0.000
Water, SK	Water	dm3	38.535	38.535	0.000
Water, TH	Water	cu.in	783.834	783.834	0.000
Water, TR	Water	dm3	263.999	263.999	0.000
Water, TW	Water	dm3	43.416	43.416	0.000
Water, TZ	Water	cu.in	147.581	147.581	0.000
Water, UA	Water	dm3	95.513	95.513	0.000
Water, UCTE	Water	mm3	0.940	0.940	0.000
Water, UCTE without Germany	Water	mm3	0.494	0.494	0.000
Water, UN-OCEANIA	Water	mm3	159.056	159.056	0.000
Water, US	Water	m3	1.667	1.667	0.000
Water, WEU	Water	cm3	111.654	111.654	0.000
Water, ZA	Water	cu.in	335.843	335.843	0.000
Xylene	Water	mg	100.650	82.921	17.729
Yttrium	Water	µg	796.330	655.983	140.347
Zinc	Water	mg	313.745	270.153	43.592
2-Methyl-4-chlorophenoxyacetic acid	Water	pg	96.753	96.753	0.000
2,4-D amines	Water	ng	3.465	3.465	0.000

2,4-D ester	Water	pg	762.486	762.486	0.000
2,4-DB	Water	ng	1.658	1.658	0.000
Aluminium	Water	mg	55.285	56.654	-1.368
Ammonium, ion	Water	mg	17.412	18.028	-0.616
Antimony	Water	µg	351.615	362.641	-11.025
Arsenic	Water	mg	1.300	1.338	-0.039
Atrazine	Water	ng	29.509	29.509	0.000
Barium	Water	mg	1.326	1.371	-0.045
Bentazone	Water	ng	1.014	1.014	0.000
Beryllium	Water	µg	183.636	188.793	-5.157
BOD5, Biological Oxygen Demand	Water	mg	7.050	7.108	-0.058
Boron	Water	mg	306.373	306.370	0.003
Bromine	Water	µg	288.002	296.499	-8.497
Bromoxynil	Water	ng	3.870	3.870	0.000
Cadmium	Water	µg	323.223	328.716	-5.493
Calcium	Water	g	8.231	8.470	-0.239
Carbaryl	Water	pg	3.432	3.432	0.000
Carbon	Water	µg	25.820	25.820	0.000
Chloride	Water	g	139.792	143.963	-4.171
Chlorine	Water	µg	276.094	276.094	0.000
Chromium	Water	µg	86.508	86.590	-0.082
Chromium VI	Water	µg	666.160	688.896	-22.736
Cobalt	Water	mg	1.395	1.432	-0.037
COD, Chemical Oxygen Demand	Water	mg	12.344	12.402	-0.058
Copper	Water	mg	1.685	1.705	-0.020
Dicamba	Water	ng	3.127	3.127	0.000
Dichlorprop	Water	pg	831.771	831.771	0.000
Dimethenamid	Water	pg	302.099	302.099	0.000
DOC, Dissolved Organic Carbon	Water	mg	4.008	4.008	0.000
Ethephon	Water	pg	0.003	0.003	0.000
Fluoride	Water	mg	90.534	93.121	-2.587
Glyphosate	Water	ng	71.639	71.639	0.000
Iodide	Water	µg	34.627	35.707	-1.080
Iron	Water	mg	822.204	826.119	-3.915
Lambda-cyhalothrin	Water	pg	0.000	0.000	0.000
Lead	Water	µg	221.651	222.556	-0.905
Lead-210	Water	mBq	1.954	1.950	0.004
Lithium	Water	ng	691.880	691.880	0.000
Magnesium	Water	g	3.128	3.225	-0.097
Manganese	Water	mg	174.654	180.448	-5.794
MCPB	Water	pg	11.680	11.680	0.000
Mercury	Water	µg	16.981	17.593	-0.612
Methomyl	Water	pg	0.002	0.002	0.000
Metolachlor	Water	ng	4.079	4.079	0.000
Molybdenum	Water	mg	3.259	3.310	-0.051
Nickel	Water	mg	7.326	7.586	-0.260
Nitrate	Water	g	19.886	19.901	-0.015
Nitrogen, organic bound	Water	µg	72.156	72.156	0.000
Organic carbon	Water	µg	61.067	61.067	0.000
PAH, polycyclic aromatic hydrocarbons	Water	µg	2.076	2.076	0.000
Pendimethalin	Water	pg	415.736	415.736	0.000
Phosphate	Water	g	15.004	15.305	-0.302
Phosphorus	Water	mg	11.446	11.446	0.000
Polonium-210	Water	mBq	2.974	2.968	0.006

Potassium	Water	mg	480.289	493.888	-13.599
Potassium-40	Water	µBq	236.221	235.745	0.476
Propiconazole	Water	pg	3.993	3.993	0.000
Prothioconazol	Water	pg	0.000	0.000	0.000
Pyraclostrobin (prop)	Water	pg	0.017	0.017	0.000
Radium-226	Water	mBq	2.192	2.188	0.004
Scandium	Water	µg	278.781	285.999	-7.218
Selenium	Water	µg	558.919	571.698	-12.779
Silicon	Water	mg	371.479	384.148	-12.669
Silver	Water	µg	76.703	79.250	-2.546
Sodium	Water	g	1.636	1.692	-0.056
Sodium chlorate	Water	ng	24.252	24.252	0.000
Solids, inorganic	Water	g	2.560	2.604	-0.043
Strontium	Water	mg	160.501	166.016	-5.516
Sulfate	Water	g	111.546	113.269	-1.723
Sulfur	Water	mg	1.166	1.166	0.000
Suspended solids, unspecified	Water	g	2.017	2.084	-0.067
Tebuconazole	Water	pg	0.003	0.003	0.000
Tefluthrin	Water	pg	0.001	0.001	0.000
Thallium	Water	µg	15.979	16.108	-0.129
Thorium-228	Water	µBq	23.961	23.913	0.048
Thorium-232	Water	nBq	367.643	367.643	0.000
Tin	Water	µg	128.901	129.188	-0.287
Titanium	Water	µg	638.697	651.148	-12.450
TOC, Total Organic Carbon	Water	mg	4.008	4.008	0.000
Trifloxystrobin	Water	pg	0.000	0.000	0.000
Tungsten	Water	mg	1.655	1.658	-0.003
Uranium-238	Water	mBq	1.003	1.001	0.002
Vanadium	Water	µg	487.933	505.006	-17.072
Water, AR	Water	mm3	66.782	66.782	0.000
Water, BE	Water	mm3	0.153	0.153	0.000
Water, BR	Water	cm3	86.523	86.523	0.000
Water, CA	Water	cm3	35.007	35.007	0.000
Water, CH	Water	cm3	8.794	8.794	0.000
Water, CI	Water	mm3	165.259	165.259	0.000
Water, CL	Water	mm3	3.006	3.006	0.000
Water, CN	Water	mm3	932.498	932.498	0.000
Water, CO	Water	mm3	10.612	10.612	0.000
Water, CR	Water	mm3	1.957	1.957	0.000
Water, DE	Water	mm3	253.031	253.031	0.000
Water, EC	Water	mm3	22.178	22.178	0.000
Water, ES	Water	mm3	187.306	187.306	0.000
Water, Europe without Switzerland	Water	cm3	19.965	19.965	0.000
Water, FI	Water	mm3	0.854	0.854	0.000
Water, FR	Water	mm3	54.910	54.910	0.000
Water, GH	Water	mm3	160.594	160.594	0.000
Water, GLO	Water	cm3	4.473	4.473	0.000
Water, ID	Water	mm3	81.390	81.390	0.000
Water, IL	Water	mm3	0.711	0.711	0.000
Water, IN	Water	cm3	3.261	3.261	0.000
Water, IT	Water	mm3	13.997	13.997	0.000
Water, MX	Water	mm3	48.673	48.673	0.000
Water, MY	Water	mm3	504.163	504.163	0.000
Water, NL	Water	mm3	0.696	0.696	0.000

Water, NZ	Water	mm3	0.015	0.015	0.000
Water, PE	Water	mm3	5.299	5.299	0.000
Water, PH	Water	mm3	417.440	417.440	0.000
Water, RER	Water	mm3	185.403	185.403	0.000
Water, RNA	Water	mm3	0.666	0.666	0.000
Water, RoW	Water	cm3	177.229	177.229	0.000
Water, RU	Water	mm3	24.385	24.385	0.000
Water, TR	Water	mm3	1.316	1.316	0.000
Water, UA	Water	mm3	3.645	3.645	0.000
Water, US	Water	cm3	3.388	3.388	0.000
Water, VN	Water	mm3	14.603	14.603	0.000
Water, ZA	Water	mm3	1.445	1.445	0.000
Zinc	Water	mg	18.683	18.962	-0.279
Aluminium	Water	g	380.282	76.886	303.396
Ammonium, ion	Water	g	15.687	0.155	15.532
Antimony	Water	mg	124.001	67.784	56.217
Arsenic	Water	mg	250.124	239.378	10.746
Barium	Water	g	4.475	0.886	3.589
Beryllium	Water	mg	52.819	54.175	-1.356
BOD5, Biological Oxygen Demand	Water	g	492.288	36.340	455.949
Boron	Water	g	3.423	3.372	0.051
Bromine	Water	mg	306.279	16.071	290.208
Cadmium	Water	mg	390.079	105.127	284.953
Calcium	Water	g	988.298	660.905	327.393
Chloride	Water	g	216.560	80.198	136.362
Chromium VI	Water	g	1.044	1.009	0.035
Cobalt	Water	g	1.097	1.043	0.054
COD, Chemical Oxygen Demand	Water	kg	2.035	0.116	1.919
Copper	Water	g	31.395	1.615	29.780
DOC, Dissolved Organic Carbon	Water	kg	1.812	0.056	1.756
Fluoride	Water	g	8.806	7.615	1.192
Heat, waste	Water	MJ	275.890	2.665	273.224
Hydrogen sulfide	Water	g	2.144	0.303	1.841
Iodide	Water	µg	93.450	0.899	92.552
Iron	Water	g	134.648	83.486	51.162
Lead	Water	g	12.655	0.300	12.355
Magnesium	Water	g	369.010	302.014	66.996
Manganese	Water	g	38.341	32.749	5.593
Mercury	Water	mg	41.904	6.658	35.246
Molybdenum	Water	mg	203.642	188.355	15.287
Nickel	Water	g	6.468	3.765	2.703
Nitrate	Water	g	22.818	21.857	0.961
Nitrite	Water	mg	855.225	8.476	846.748
Nitrogen, organic bound	Water	g	25.607	0.254	25.353
Phosphate	Water	g	73.584	75.226	-1.642
Potassium	Water	g	251.061	216.265	34.795
Scandium	Water	mg	106.634	109.714	-3.080
Selenium	Water	mg	133.438	133.835	-0.397
Silicon	Water	g	814.912	773.608	41.304
Silver	Water	mg	24.791	7.247	17.543
Sodium	Water	g	346.091	253.078	93.013
Strontium	Water	g	8.218	8.471	-0.253
Sulfate	Water	kg	2.063	2.048	0.016
Thallium	Water	mg	10.609	10.723	-0.114

Tin	Water	g	1.902	0.096	1.807
Titanium	Water	g	2.973	3.061	-0.088
TOC, Total Organic Carbon	Water	kg	1.812	0.056	1.756
Tungsten	Water	mg	121.494	122.047	-0.553
Vanadium	Water	mg	670.840	615.684	55.156
Zinc	Water	g	34.109	7.611	26.497
Arsenic	Water	pg	0.245	0.247	-0.002
Cadmium	Water	pg	0.208	0.210	-0.001
Calcium	Water	mg	1.379	1.387	-0.008
Copper	Water	pg	9.450	9.515	-0.065
DOC, Dissolved Organic Carbon	Water	µg	102.371	101.749	0.622
Lead	Water	pg	0.617	0.621	-0.004
Mercury	Water	pg	0.005	0.005	0.000
Nickel	Water	pg	0.838	0.844	-0.006
Zinc	Water	pg	0.608	0.612	-0.004
4-Methyl-2-pentanone	Water	µg	-21.118	76.699	-97.817
Acenaphthene	Water	µg	6.475	6.380	0.094
Acenaphthylene	Water	ng	404.924	399.026	5.898
Acetone	Water	µg	-50.334	182.808	-233.143
Acidity, unspecified	Water	mg	-1.059	3.846	-4.906
Actinides, radioactive, unspecified	Water	mBq	20.755	21.232	-0.477
Aluminium	Water	mg	-91.622	337.874	-429.497
Ammonium, ion	Water	mg	78.610	364.129	-285.520
Antimony	Water	µg	-56.686	205.876	-262.561
AOX, Adsorbable Organic Halogen as Cl	Water	µg	401.201	395.399	5.801
Arsenic	Water	mg	-0.422	4.728	-5.150
Barite	Water	µg	536.624	545.328	-8.704
Barium	Water	g	-0.526	6.102	-6.628
Benzene	Water	mg	77.581	115.457	-37.875
Benzene, ethyl-	Water	mg	24.512	26.347	-1.835
Beryllium	Water	µg	-50.493	183.385	-233.878
BOD5, Biological Oxygen Demand	Water	g	109.880	112.401	-2.521
Boron	Water	mg	-6.869	66.260	-73.129
Bromine	Water	g	-0.351	4.639	-4.991
Cadmium	Water	µg	193.514	940.125	-746.611
Calcium	Water	g	21.262	95.807	-74.545
Carbonate	Water	µg	95.688	95.688	0.000
Carboxylic acids, unspecified	Water	g	5.752	5.668	0.084
Cesium	Water	mg	1.041	1.026	0.015
Cesium-137	Water	Bq	2.378	2.433	-0.055
Chloride	Water	kg	0.341	1.179	-0.838
Chlorinated solvents, unspecified	Water	pg	0.003	0.003	0.000
Chromium	Water	mg	2.339	14.110	-11.771
Cobalt	Water	µg	-111.553	405.481	-517.034
COD, Chemical Oxygen Demand	Water	g	111.066	116.216	-5.150
Copper	Water	mg	-0.281	3.009	-3.290
Cyanide	Water	mg	3.803	3.751	0.052
DOC, Dissolved Organic Carbon	Water	g	36.500	35.989	0.511
Fluoride	Water	mg	159.600	158.050	1.551
Glutaraldehyde	Water	ng	66.250	67.325	-1.075
Heat, waste	Water	MJ	11.320	11.804	-0.484
Hydrocarbons, aliphatic, alkanes, unspecified	Water	mg	135.322	133.351	1.971
Hydrocarbons, aliphatic, unsaturated	Water	mg	12.491	12.309	0.182
Hydrocarbons, aromatic	Water	mg	556.776	548.669	8.107

Hydrocarbons, unspecified	Water	mg	6.070	6.032	0.038
Hydrogen-3, Tritium	Water	kBq	4.941	5.055	-0.114
Hydrogen carbonate	Water	mg	10.514	10.514	0.000
Hypochlorite	Water	mg	1.372	1.396	-0.024
Iodide	Water	mg	104.094	102.577	1.516
Iron	Water	g	-0.237	1.116	-1.352
Lead	Water	mg	5.240	12.570	-7.330
Lead-210	Water	Bq	11.885	18.631	-6.746
Lithium	Water	g	-5.415	19.665	-25.079
m-Xylene	Water	µg	-152.591	554.192	-706.783
Magnesium	Water	g	2.687	17.239	-14.552
Manganese	Water	mg	41.014	64.027	-23.014
Mercury	Water	µg	1.608	6.153	-4.545
Methanol	Water	µg	67.426	68.553	-1.127
Molybdenum	Water	µg	99.641	632.698	-533.057
Nickel	Water	mg	-0.265	3.811	-4.076
Nitrate	Water	mg	178.221	175.716	2.505
Nitrite	Water	µg	32.203	32.944	-0.741
Nitrogen	Water	mg	4.208	4.147	0.061
Nitrogen, organic bound	Water	mg	292.080	290.218	1.862
o-Xylene	Water	µg	-111.149	403.678	-514.826
Oils, unspecified	Water	g	35.229	35.186	0.043
PAH, polycyclic aromatic hydrocarbons	Water	mg	8.272	8.152	0.120
Phenol	Water	mg	128.216	136.763	-8.547
Phosphate	Water	mg	225.079	224.987	0.093
Phosphorus	Water	mg	8.326	8.206	0.120
Polonium-210	Water	Bq	20.361	20.353	0.008
Potassium	Water	g	4.410	4.346	0.064
Potassium-40	Water	Bq	1.613	1.612	0.001
Radioactive species, Nuclides, unspecified	Water	Bq	12.409	12.694	-0.285
Radium-224	Water	Bq	52.047	51.289	0.758
Radium-226	Water	Bq	91.630	121.301	-29.670
Radium-228	Water	Bq	94.709	136.659	-41.950
Rubidium	Water	mg	10.409	10.258	0.152
Selenium	Water	µg	311.655	358.862	-47.207
Silicon	Water	ng	51.237	51.500	-0.263
Silver	Water	mg	-9.935	38.965	-48.899
Sodium	Water	g	268.288	501.202	-232.914
Strontium	Water	g	1.615	2.860	-1.245
Strontium-90	Water	mBq	264.420	270.502	-6.082
Sulfate	Water	g	14.392	16.050	-1.658
Sulfide	Water	mg	2.181	2.150	0.031
Sulfur	Water	mg	1.273	62.913	-61.640
Suspended solids, unspecified	Water	kg	-0.223	0.814	-1.037
t-Butyl methyl ether	Water	mg	6.771	6.673	0.098
Thallium	Water	µg	-11.972	43.482	-55.454
Thorium-228	Water	Bq	208.351	205.318	3.032
Tin	Water	mg	-0.554	2.013	-2.567
Titanium	Water	mg	-0.870	3.160	-4.030
TOC, Total Organic Carbon	Water	g	37.019	36.507	0.511
Toluene	Water	mg	150.967	185.648	-34.681
Tributyltin compounds	Water	mg	3.529	3.481	0.047
Triethylene glycol	Water	µg	58.031	58.972	-0.941
Uranium-238	Water	Bq	6.845	6.842	0.003

Vanadium	Water	mg	0.507	1.132	-0.625
VOC, volatile organic compounds, unspecified origin	Water	mg	364.328	359.021	5.307
Water, AT	Water	mm3	475.888	475.888	0.000
Water, BE	Water	mm3	994.315	994.315	0.000
Water, BG	Water	cm3	1.736	1.736	0.000
Water, CH	Water	mm3	77.576	77.576	0.000
Water, CN	Water	cm3	1.342	1.342	0.000
Water, CZ	Water	mm3	64.525	64.525	0.000
Water, DE	Water	cm3	5.469	5.469	0.000
Water, DK	Water	mm3	794.967	794.967	0.000
Water, ES	Water	mm3	697.647	697.647	0.000
Water, Europe without Switzerland	Water	mm3	16.895	16.895	0.000
Water, FI	Water	mm3	267.662	267.662	0.000
Water, FR	Water	cm3	2.131	2.131	0.000
Water, GB	Water	cm3	1.931	1.931	0.000
Water, GLO	Water	cm3	28.998	28.998	0.000
Water, HU	Water	mm3	271.618	271.618	0.000
Water, IAI Area, Africa	Water	mm3	101.125	101.125	0.000
Water, IAI Area, Asia, without China and GCC	Water	mm3	182.515	182.515	0.000
Water, IAI Area, EU27 & EFTA	Water	cm3	5.250	5.250	0.000
Water, IAI Area, Gulf Cooperation Council	Water	mm3	222.536	222.536	0.000
Water, IAI Area, North America, without Quebec	Water	mm3	127.699	127.699	0.000
Water, IAI Area, Russia & RER w/o EU27 & EFTA	Water	mm3	380.359	380.359	0.000
Water, IAI Area, South America	Water	mm3	107.895	107.895	0.000
Water, IT	Water	cm3	2.068	2.068	0.000
Water, JP	Water	cm3	3.431	3.431	0.000
Water, KR	Water	mm3	261.479	261.479	0.000
Water, LU	Water	mm3	43.135	43.135	0.000
Water, NL	Water	cm3	1.952	1.952	0.000
Water, NO	Water	mm3	105.398	105.398	0.000
Water, PL	Water	mm3	38.082	38.082	0.000
Water, PT	Water	mm3	246.323	246.323	0.000
Water, RER	Water	cm3	7.968	7.968	0.000
Water, RNA	Water	mm3	0.000	0.000	0.000
Water, RoW	Water	cm3	2.990	2.990	0.000
Water, RU	Water	cm3	1.329	1.329	0.000
Water, SE	Water	cm3	1.374	1.374	0.000
Water, SK	Water	mm3	24.234	24.234	0.000
Water, TR	Water	mm3	50.957	50.957	0.000
Water, TW	Water	cm3	1.279	1.279	0.000
Water, UN-OCEANIA	Water	mm3	132.473	132.473	0.000
Water, US	Water	mm3	0.571	0.571	0.000
Xylene	Water	mg	119.034	135.924	-16.890
Zinc	Water	mg	75.737	86.154	-10.417
1-Butanol	Water	µg	228.058	228.056	0.002
1-Pentanol	Water	mg	8.657	8.657	0.000
1-Pentene	Water	mg	6.542	6.542	0.000
1-Propanol	Water	mg	11.567	11.567	0.000
1,4-Butanediol	Water	µg	11.582	11.581	0.001
2-Aminopropanol	Water	ng	929.514	928.122	1.392
2-Butene, 2-methyl-	Water	µg	1.453	1.453	0.000
2-Methyl-1-propanol	Water	mg	14.899	14.899	0.000
2-Methyl-4-chlorophenoxyacetic acid	Water	ng	2.527	2.527	0.000
2-Propanol	Water	µg	3.257	3.251	0.006

2,4-D amines	Water	pg	14.160	14.160	0.000
2,4-D ester	Water	pg	2.917	2.917	0.000
2,4-DB	Water	pg	6.833	6.833	0.000
4-Methyl-2-pentanol	Water	pg	0.063	0.063	0.000
Acenaphthene	Water	µg	16.118	15.919	0.199
Acenaphthylene	Water	ng	987.217	974.770	12.447
Acetaldehyde	Water	mg	73.174	73.174	0.000
Acetic acid	Water	mg	279.024	279.019	0.005
Acetone	Water	mg	6.952	6.952	0.000
Acetonitrile	Water	ng	207.309	206.870	0.439
Acetyl chloride	Water	mg	6.801	6.801	0.000
Acidity, unspecified	Water	mg	705.054	704.964	0.090
Acrylate	Water	ng	78.572	78.658	-0.086
Aluminium	Water	mg	403.239	267.857	135.382
Ammonium, ion	Water	g	23.577	4.796	18.781
Aniline	Water	µg	43.949	43.890	0.060
Anthracene	Water	ng	74.040	74.040	0.000
Antimony	Water	mg	12.794	10.574	2.219
Antimony-122	Water	µBq	236.929	237.670	-0.741
Antimony-124	Water	mBq	755.028	755.124	-0.096
Antimony-125	Water	mBq	12.993	13.075	-0.081
AOX, Adsorbable Organic Halogen as Cl	Water	mg	23.576	23.533	0.042
Arsenic	Water	mg	54.958	55.757	-0.799
Atrazine	Water	pg	114.130	114.130	0.000
Barium	Water	g	2.225	2.181	0.044
Barium-140	Water	µBq	560.565	563.812	-3.247
Bentazone	Water	pg	0.628	0.628	0.000
Benzene	Water	mg	853.384	851.151	2.233
Benzene, 1,2-dichloro-	Water	mg	64.603	64.603	0.000
Benzene, chloro-	Water	mg	600.495	600.495	0.000
Benzene, ethyl-	Water	mg	60.852	60.084	0.768
Benzo(a)anthracene	Water	pg	279.397	279.397	0.000
Benzo(a)pyrene	Water	pg	33.947	33.947	0.000
Benzo(b)fluoranthene	Water	pg	33.109	33.109	0.000
Benzo(g,h,i)perylene	Water	pg	4.659	4.659	0.000
Benzo(k)fluoranthene	Water	pg	15.576	15.576	0.000
Beryllium	Water	µg	12.871	13.410	-0.538
BOD5, Biological Oxygen Demand	Water	g	594.393	578.142	16.251
Borate	Water	mg	657.494	657.494	0.000
Boron	Water	mg	172.324	70.819	101.505
Bromate	Water	mg	24.710	24.548	0.162
Bromide	Water	g	29.571	29.571	0.000
Bromine	Water	g	1.873	1.810	0.063
Bromoxynil	Water	pg	15.837	15.837	0.000
Butene	Water	mg	228.483	228.483	0.000
Butyl acetate	Water	µg	292.566	292.566	0.000
Butyrolactone	Water	µg	8.433	8.433	0.000
Cadmium	Water	mg	2.806	1.059	1.747
Calcium	Water	g	99.977	92.246	7.730
Carbaryl	Water	pg	0.043	0.043	0.000
Carbon-14	Water	mBq	82.787	82.787	0.000
Carbon disulfide	Water	mg	17.941	17.941	0.000
Carbonate	Water	mg	84.397	83.711	0.685
Carboxylic acids, unspecified	Water	g	9.330	9.212	0.118

Cerium-141	Water	µBq	245.337	246.635	-1.298
Cerium-144	Water	µBq	126.327	126.722	-0.395
Cesium	Water	mg	2.535	2.503	0.032
Cesium-134	Water	mBq	7.749	7.803	-0.053
Cesium-136	Water	µBq	73.647	73.877	-0.230
Cesium-137	Water	mBq	85.570	86.047	-0.478
Chloramine	Water	mg	112.819	112.819	0.000
Chlorate	Water	mg	190.434	189.149	1.285
Chloride	Water	kg	1.427	1.380	0.047
Chlorinated solvents, unspecified	Water	µg	631.982	628.625	3.356
Chlorine	Water	µg	959.927	832.871	127.056
Chloroacetic acid	Water	µg	266.620	266.420	0.201
Chloroacetyl chloride	Water	µg	1.240	1.238	0.002
Chloroform	Water	ng	768.264	766.618	1.646
Chlorosulfonic acid	Water	ng	753.860	752.263	1.597
Chromium	Water	mg	5.420	5.390	0.030
Chromium-51	Water	mBq	42.635	42.890	-0.255
Chromium VI	Water	mg	260.722	254.598	6.124
Chrysene	Water	pg	180.211	180.211	0.000
Cobalt	Water	mg	3.048	1.514	1.534
Cobalt-57	Water	mBq	2.338	2.345	-0.007
Cobalt-58	Water	mBq	321.446	322.763	-1.317
Cobalt-60	Water	mBq	219.384	220.497	-1.112
COD, Chemical Oxygen Demand	Water	g	615.143	581.493	33.650
Copper	Water	mg	8.549	6.600	1.948
Cumene	Water	mg	45.435	45.008	0.428
Cyanide	Water	mg	51.738	51.656	0.081
Dibenz(a,h)anthracene	Water	pg	3.262	3.262	0.000
Dicamba	Water	pg	12.509	12.509	0.000
Dichlorprop	Water	pg	3.496	3.496	0.000
Dichromate	Water	µg	2.755	2.436	0.319
Diethylamine	Water	µg	19.923	19.896	0.027
Dimethenamid	Water	pg	3.776	3.776	0.000
Dimethylamine	Water	µg	15.390	15.362	0.028
Dipropylamine	Water	µg	12.203	12.186	0.016
DOC, Dissolved Organic Carbon	Water	g	182.356	173.728	8.628
Ethane, 1,1,1-trichloro-, HCFC-140	Water	pg	0.299	0.299	0.000
Ethane, 1,2-dichloro-	Water	mg	12.555	12.556	-0.001
Ethanol	Water	g	1.553	1.553	0.000
Ethene	Water	mg	16.356	16.336	0.020
Ethene, chloro-	Water	µg	6.545	4.720	1.824
Ethephon	Water	pg	0.000	0.000	0.000
Ethyl acetate	Water	µg	26.559	26.532	0.027
Ethylamine	Water	mg	7.627	7.627	0.000
Ethylene diamine	Water	mg	7.082	7.082	0.000
Ethylene oxide	Water	g	1.465	1.465	0.000
Fluoranthene	Water	µg	1.467	1.467	0.000
Fluorene	Water	ng	540.633	540.633	0.000
Fluoride	Water	mg	348.002	320.759	27.243
Fluosilicic acid	Water	µg	121.525	123.662	-2.137
Formaldehyde	Water	mg	5.988	5.971	0.017
Formamide	Water	mg	15.833	15.833	0.000
Formate	Water	µg	178.402	178.095	0.307
Formic acid	Water	mg	4.596	4.596	0.000

Glyphosate	Water	pg	369.873	369.873	0.000
Heat, waste	Water	MJ	173.076	176.596	-3.520
Hydrocarbons, aliphatic, alkanes, unspecified	Water	mg	329.597	325.438	4.160
Hydrocarbons, aliphatic, unsaturated	Water	mg	30.429	30.045	0.384
Hydrocarbons, aromatic	Water	g	1.332	1.315	0.017
Hydrocarbons, unspecified	Water	mg	29.199	29.068	0.131
Hydrogen-3, Tritium	Water	kBq	33.975	35.235	-1.261
Hydrogen peroxide	Water	µg	429.820	429.112	0.709
Hydrogen sulfide	Water	mg	2.115	2.095	0.020
Hydroxide	Water	mg	17.506	17.506	0.000
Hypochlorite	Water	mg	1.325	1.346	-0.021
Indeno(1,2,3-cd)pyrene	Water	pg	51.199	51.199	0.000
Iodide	Water	g	2.900	2.897	0.003
Iodine-131	Water	mBq	147.489	147.507	-0.018
Iodine-133	Water	µBq	402.052	404.090	-2.039
Iron	Water	mg	913.490	524.721	388.769
Iron-59	Water	mBq	675.293	675.293	-0.001
Isopropylamine	Water	µg	1.412	1.409	0.002
Lactic acid	Water	µg	9.559	9.546	0.013
Lambda-cyhalothrin	Water	pg	0.000	0.000	0.000
Lanthanum-140	Water	µBq	656.711	660.170	-3.459
Lead	Water	mg	15.297	15.060	0.237
Lead-210	Water	Bq	6.378	6.651	-0.273
Lithium	Water	mg	302.022	302.022	0.000
m-Xylene	Water	mg	12.796	12.796	0.000
Magnesium	Water	g	24.517	15.329	9.188
Manganese	Water	mg	402.572	327.723	74.849
Manganese-54	Water	mBq	12.655	12.734	-0.079
MCPB	Water	ng	2.526	2.526	0.000
Mercury	Water	µg	200.071	177.737	22.333
Methane, dichloro-, HCC-30	Water	mg	14.752	14.752	0.000
Methanol	Water	mg	45.002	45.003	0.000
Methomyl	Water	pg	0.000	0.000	0.000
Methyl acetate	Water	ng	324.288	323.546	0.742
Methyl acrylate	Water	ng	735.842	736.651	-0.809
Methyl formate	Water	µg	696.376	696.376	0.000
Methylamine	Water	µg	21.500	21.499	0.001
Metolachlor	Water	pg	18.534	18.534	0.000
Molybdenum	Water	mg	39.666	40.436	-0.771
Molybdenum-99	Water	µBq	206.572	207.765	-1.192
Naphthalene	Water	ng	108.406	108.406	0.000
Nickel	Water	mg	16.744	10.743	6.001
Niobium-95	Water	mBq	1.122	1.127	-0.005
Nitrate	Water	g	74.118	5.715	68.403
Nitrite	Water	mg	442.349	48.511	393.839
Nitrobenzene	Water	µg	100.128	99.992	0.137
Nitrogen	Water	g	1.385	0.874	0.511
Nitrogen, organic bound	Water	mg	373.522	369.502	4.020
Oils, biogenic	Water	µg	8.373	8.373	0.000
Oils, unspecified	Water	g	180.897	178.294	2.603
PAH, polycyclic aromatic hydrocarbons	Water	mg	15.660	15.505	0.155
Paraffins	Water	µg	23.655	23.655	0.000
Pendimethalin	Water	pg	0.697	0.697	0.000
Phenanthrene	Water	µg	1.217	1.217	0.000

Phenol	Water	mg	230.093	227.310	2.782
Phosphate	Water	g	1.366	1.006	0.360
Phosphorus	Water	mg	129.527	128.962	0.565
Polonium-210	Water	Bq	6.378	6.651	-0.273
Potassium	Water	g	26.096	15.567	10.528
Potassium-40	Water	Bq	8.007	8.349	-0.342
Propanal	Water	mg	12.532	12.532	0.000
Propene	Water	mg	28.239	28.079	0.161
Propiconazole	Water	pg	0.000	0.000	0.000
Propionic acid	Water	µg	11.010	11.004	0.007
Propylamine	Water	mg	5.014	5.014	0.000
Propylene oxide	Water	mg	13.751	13.747	0.004
Protactinium-234	Water	Bq	2.035	2.120	-0.085
Prothioconazol	Water	pg	0.000	0.000	0.000
Pyraclostrobin (prop)	Water	pg	3.261	3.261	0.000
Pyrene	Water	µg	1.105	1.105	0.000
Radioactive species, alpha emitters	Water	mBq	37.789	37.775	0.014
Radioactive species, Nuclides, unspecified	Water	Bq	86.495	90.168	-3.673
Radium-224	Water	Bq	126.768	125.168	1.600
Radium-226	Water	kBq	1.458	1.509	-0.050
Radium-228	Water	Bq	253.537	250.337	3.200
Rubidium	Water	mg	25.354	25.034	0.320
Ruthenium-103	Water	µBq	77.788	78.039	-0.252
Scandium	Water	mg	4.766	4.967	-0.201
Selenium	Water	mg	4.368	4.426	-0.058
Silicon	Water	g	1.737	1.373	0.364
Silicon dioxide	Water	µg	91.646	91.646	0.000
Silver	Water	mg	2.454	2.424	0.029
Silver-110	Water	mBq	159.896	161.011	-1.115
Sodium	Water	g	852.709	817.328	35.381
Sodium-24	Water	mBq	2.760	2.769	-0.009
Sodium formate	Water	µg	3.343	3.220	0.123
Solids, inorganic	Water	g	1.121	1.112	0.009
Strontium	Water	g	4.577	4.520	0.058
Strontium-89	Water	mBq	3.924	3.945	-0.020
Strontium-90	Water	Bq	4.606	4.608	-0.002
Sulfate	Water	g	56.125	48.993	7.132
Sulfide	Water	mg	26.054	26.036	0.017
Sulfite	Water	mg	20.336	21.029	-0.693
Sulfur	Water	mg	695.716	688.729	6.987
Suspended solids, unspecified	Water	g	30.285	30.246	0.039
t-Butyl methyl ether	Water	mg	6.602	6.602	0.000
t-Butylamine	Water	µg	1.389	1.387	0.002
Tebuconazole	Water	pg	0.000	0.000	0.000
Technetium-99m	Water	mBq	5.069	5.096	-0.027
Tefluthrin	Water	pg	0.000	0.000	0.000
Tellurium-123m	Water	µBq	692.688	700.788	-8.100
Tellurium-132	Water	µBq	22.068	22.137	-0.069
Thallium	Water	µg	16.220	16.540	-0.320
Thorium-228	Water	Bq	507.073	500.673	6.400
Thorium-230	Water	Bq	275.137	286.715	-11.578
Thorium-232	Water	Bq	1.493	1.557	-0.064
Thorium-234	Water	Bq	2.036	2.121	-0.085
Tin	Water	µg	688.469	562.457	126.012

Titanium	Water	mg	4.437	4.577	-0.140
TOC, Total Organic Carbon	Water	g	183.100	174.213	8.887
Toluene	Water	mg	319.726	316.065	3.661
Toluene, 2-chloro-	Water	µg	16.337	16.315	0.022
Triethylene glycol	Water	µg	1.666	1.666	0.000
Trifloxystrobin	Water	pg	0.000	0.000	0.000
Trimethylamine	Water	ng	548.299	546.757	1.542
Tungsten	Water	mg	5.278	5.503	-0.226
Uranium-234	Water	Bq	2.440	2.542	-0.102
Uranium-235	Water	Bq	3.996	4.164	-0.168
Uranium-238	Water	Bq	9.233	9.623	-0.390
Uranium alpha	Water	Bq	116.276	121.162	-4.886
Urea	Water	mg	14.401	14.401	0.000
Vanadium	Water	mg	7.221	5.071	2.151
VOC, volatile organic compounds, unspecified origin	Water	mg	892.405	881.417	10.989
Water, AR	Water	mm3	267.132	267.132	0.000
Water, AT	Water	mm3	657.542	657.542	0.000
Water, BE	Water	cm3	1.374	1.374	0.000
Water, BG	Water	cm3	2.405	2.405	0.000
Water, BR	Water	cm3	21.865	21.865	0.000
Water, CA	Water	cu.in	141.918	141.918	0.000
Water, CH	Water	cm3	38.832	38.832	0.000
Water, CI	Water	mm3	661.005	661.005	0.000
Water, CL	Water	mm3	12.024	12.024	0.000
Water, CN	Water	cm3	252.335	252.335	0.000
Water, CO	Water	mm3	19.576	19.576	0.000
Water, CR	Water	mm3	7.827	7.827	0.000
Water, CZ	Water	mm3	89.098	89.098	0.000
Water, DE	Water	cm3	7.621	7.621	0.000
Water, DK	Water	cm3	1.099	1.099	0.000
Water, EC	Water	mm3	88.711	88.711	0.000
Water, ES	Water	cm3	1.123	1.123	0.000
Water, Europe without Switzerland	Water	mm3	817.589	817.589	0.000
Water, FI	Water	mm3	373.310	373.310	0.000
Water, FR	Water	cm3	2.961	2.961	0.000
Water, GB	Water	cm3	2.669	2.669	0.000
Water, GH	Water	mm3	642.377	642.377	0.000
Water, GLO	Water	cm3	18.077	18.077	0.000
Water, HN	Water	mm3	1.009	1.009	0.000
Water, HU	Water	mm3	375.747	375.747	0.000
Water, IAI Area, Africa	Water	mm3	109.850	109.850	0.000
Water, IAI Area, Asia, without China and GCC	Water	mm3	201.164	201.164	0.000
Water, IAI Area, EU27 & EFTA	Water	cm3	1.686	1.686	0.000
Water, IAI Area, Gulf Cooperation Council	Water	mm3	241.735	241.735	0.000
Water, IAI Area, North America, without Quebec	Water	mm3	157.119	157.119	0.000
Water, IAI Area, Russia & RER w/o EU27 & EFTA	Water	mm3	409.042	409.042	0.000
Water, IAI Area, South America	Water	mm3	152.870	152.870	0.000
Water, ID	Water	mm3	327.986	327.986	0.000
Water, IL	Water	mm3	2.844	2.844	0.000
Water, IN	Water	cm3	730.305	730.305	0.000
Water, IT	Water	cm3	2.912	2.912	0.000
Water, JP	Water	cm3	6.713	6.713	0.000
Water, KR	Water	cm3	438.417	438.417	0.000
Water, LU	Water	mm3	59.563	59.563	0.000

Water, MX	Water	mm3	194.692	194.692	0.000
Water, MY	Water	mm3	126.041	126.041	0.000
Water, NL	Water	cm3	2.698	2.698	0.000
Water, NO	Water	mm3	145.541	145.541	0.000
Water, NZ	Water	mm3	0.061	0.061	0.000
Water, PE	Water	mm3	21.196	21.196	0.000
Water, PH	Water	cm3	1.670	1.670	0.000
Water, PL	Water	mm3	52.637	52.637	0.000
Water, PT	Water	mm3	340.207	340.207	0.000
Water, RER	Water	cm3	14.703	14.703	0.000
Water, RNA	Water	mm3	0.171	0.171	0.000
Water, RO	Water	cm3	326.660	326.660	0.000
Water, RoW	Water	cm3	207.614	207.614	0.000
Water, RU	Water	cm3	117.906	117.906	0.000
Water, SE	Water	cm3	1.897	1.897	0.000
Water, SK	Water	mm3	33.467	33.467	0.000
Water, TR	Water	mm3	75.631	75.631	0.000
Water, TW	Water	cm3	1.767	1.767	0.000
Water, UA	Water	mm3	14.580	14.580	0.000
Water, UN-OCEANIA	Water	mm3	143.902	143.902	0.000
Water, US	Water	cm3	1.595	1.595	0.000
Water, VN	Water	mm3	63.054	63.054	0.000
Water, ZA	Water	mm3	5.782	5.782	0.000
Xylene	Water	mg	240.186	237.158	3.028
Zinc	Water	mg	295.859	275.936	19.924
Zinc-65	Water	mBq	74.188	74.311	-0.122
Zirconium-95	Water	mBq	337.961	337.962	-0.001
Benzene, chloro-	Water	mg	14.677	14.677	0.000
Chloride	Water	mg	1.008	1.007	0.001
Aluminium	Soil	µg	171.982	171.982	0.000
Antimony	Soil	µg	1.061	1.061	0.000
Arsenic	Soil	µg	2.020	2.020	0.000
Barium	Soil	µg	66.552	66.552	0.000
Boron	Soil	ng	242.634	245.495	-2.861
Bromine	Soil	µg	10.609	10.609	0.000
Cadmium	Soil	µg	28.070	27.366	0.705
Calcium	Soil	µg	473.774	473.774	0.000
Carbon	Soil	µg	25.820	25.820	0.000
Carbon dioxide, to soil or biomass stock	Soil	mg	53.104	53.104	0.000
Chloride	Soil	µg	669.622	676.976	-7.354
Chlorine	Soil	µg	276.094	276.094	0.000
Chromium	Soil	µg	134.613	131.253	3.360
Chromium VI	Soil	µg	1.371	1.387	-0.016
Cobalt	Soil	µg	6.787	6.787	0.000
Copper	Soil	mg	1.805	1.757	0.047
Fluoride	Soil	ng	927.336	938.271	-10.934
Heat, waste	Soil	MJ	15.418	15.377	0.041
Hydrocarbons, unspecified	Soil	µg	1.409	1.409	0.000
Iron	Soil	g	1.847	1.882	-0.035
Lead	Soil	mg	1.146	1.117	0.029
Lithium	Soil	ng	691.880	691.880	0.000
Manganese	Soil	µg	27.082	27.082	0.000
Molybdenum	Soil	µg	1.489	1.489	0.000
Nickel	Soil	µg	346.351	337.246	9.105

Nitrate	Soil	µg	797.311	797.311	0.000
Oils, biogenic	Soil	µg	2.826	2.844	-0.019
Oils, unspecified	Soil	g	1.017	1.003	0.015
Organic carbon	Soil	µg	61.067	61.067	0.000
PAH, polycyclic aromatic hydrocarbons	Soil	µg	2.076	2.076	0.000
Phenol, pentachloro-	Soil	ng	1.510	1.510	0.000
Potassium	Soil	µg	148.919	148.919	0.000
Selenium	Soil	µg	10.609	10.609	0.000
Silicon	Soil	µg	955.456	955.456	0.000
Silver	Soil	ng	53.176	53.176	0.000
Sodium	Soil	µg	347.243	347.278	-0.035
Strontium	Soil	µg	7.644	7.644	0.000
Sulfate	Soil	mg	1.331	1.331	0.000
Sulfur	Soil	µg	312.335	312.335	0.000
Titanium	Soil	µg	200.975	200.975	0.000
Vanadium	Soil	ng	531.760	531.760	0.000
Zinc	Soil	mg	76.176	74.186	1.990
2-Methyl-4-chlorophenoxyacetic acid	Soil	µg	1.024	1.024	0.000
2,4-D	Soil	mg	10.560	10.559	0.000
2,4-D amines	Soil	ng	111.169	111.169	0.000
2,4-D ester	Soil	ng	29.894	29.894	0.000
Abamectin	Soil	ng	9.159	9.159	0.000
Acephate	Soil	µg	1.393	1.393	0.000
Acetamide	Soil	ng	282.001	282.001	0.000
Acetamiprid	Soil	ng	436.905	436.905	0.000
Acetochlor	Soil	µg	7.284	7.284	0.000
Acifluorfen	Soil	pg	110.246	110.246	0.000
Aclonifen	Soil	mg	4.586	4.586	0.000
Alachlor	Soil	µg	1.313	1.313	0.000
Aldicarb	Soil	µg	6.865	6.614	0.251
Aldrin	Soil	µg	206.451	206.451	0.000
Alpha-cypermethrin	Soil	ng	5.994	5.994	0.000
Aluminium	Soil	g	2.456	2.456	-0.001
Ametryn	Soil	ng	123.142	123.142	0.000
Amidosulfuron	Soil	pg	352.824	352.824	0.000
Anthraquinone	Soil	ng	113.265	113.265	0.000
Antimony	Soil	ng	6.283	6.292	-0.009
Arsenic	Soil	µg	796.352	796.546	-0.194
Asulam	Soil	ng	21.002	21.002	0.000
Atrazine	Soil	µg	108.661	108.661	0.000
Azinphos-methyl	Soil	ng	290.532	266.522	24.010
Azoxystrobin	Soil	µg	3.009	2.891	0.119
Barium	Soil	µg	36.196	35.607	0.588
Benfluralin	Soil	ng	834.378	834.378	0.000
Benomyl	Soil	µg	56.106	56.105	0.000
Bensulfuron methyl ester	Soil	ng	1.091	1.091	0.000
Bentazone	Soil	mg	2.341	2.341	0.000
Benzene, pentachloronitro-	Soil	µg	2.995	2.747	0.247
Bifenox	Soil	ng	32.367	32.367	0.000
Bifenthrin	Soil	ng	26.540	26.540	0.000
Bitertanol	Soil	ng	11.471	11.471	0.000
Boron	Soil	µg	10.233	10.068	0.164
Boscalid	Soil	ng	255.394	255.394	0.000
Bromacil	Soil	ng	246.284	246.284	0.000

Bromoxynil	Soil	ng	293.761	293.761	0.000
Bromuconazole	Soil	pg	368.475	368.475	0.000
Buprofezin	Soil	ng	8.175	8.175	0.000
Butyric acid, 4-(2,4-dichlorophenoxy)-	Soil	ng	61.987	61.987	0.000
Cadmium	Soil	mg	1.646	1.647	0.000
Calcium	Soil	g	33.032	33.040	-0.008
Captan	Soil	µg	23.001	23.001	0.000
Carbaryl	Soil	ng	228.567	224.864	3.703
Carbendazim	Soil	ng	436.896	436.896	0.000
Carbetamide	Soil	µg	476.604	476.603	0.001
Carbofuran	Soil	mg	30.760	30.760	0.000
Carbon	Soil	g	1.962	1.962	0.000
Carfentrazone-ethyl	Soil	ng	1.173	1.173	0.000
Chlorfenvinphos	Soil	ng	51.958	51.958	0.000
Chloridazon	Soil	ng	32.884	32.884	0.000
Chloride	Soil	mg	370.319	370.412	-0.093
Chlorimuron-ethyl	Soil	µg	161.739	161.739	0.000
Chlormequat	Soil	ng	440.922	440.922	0.000
Chloropicrin	Soil	µg	6.228	6.228	0.000
Chlorothalonil	Soil	µg	80.394	76.821	3.573
Chlorpyrifos	Soil	µg	523.688	523.687	0.001
Chlorpyrifos methyl	Soil	µg	6.896	6.896	0.000
Chlorsulfuron	Soil	pg	507.970	507.970	0.000
Chlortoluron	Soil	ng	495.334	495.334	0.000
Choline chloride	Soil	ng	70.030	70.030	0.000
Chromium	Soil	mg	22.861	22.867	-0.005
Cinidon-ethyl	Soil	pg	427.669	427.669	0.000
Clethodim	Soil	µg	231.180	231.180	0.001
Clodinafop-propargyl	Soil	ng	7.517	7.517	0.000
Clomazone	Soil	ng	52.236	52.236	0.000
Clopyralid	Soil	ng	400.088	400.067	0.020
Cloquintocet-mexyl	Soil	ng	1.816	1.816	0.000
Cloransulam-methyl	Soil	µg	69.433	69.433	0.000
Cobalt	Soil	mg	2.109	2.109	-0.001
Copper	Soil	mg	10.565	10.569	-0.004
Cycloxydim	Soil	ng	33.593	33.593	0.000
Cyfluthrin	Soil	ng	213.513	197.154	16.359
Cyhalothrin, gamma-	Soil	pg	220.637	220.637	0.000
Cymoxanil	Soil	ng	256.991	245.910	11.081
Cypermethrin	Soil	mg	4.347	4.347	0.000
Cyproconazole	Soil	µg	2.253	2.253	0.000
Cyprodinil	Soil	ng	744.021	744.021	0.000
Deltamethrin	Soil	ng	3.941	3.941	0.000
Desmedipham	Soil	ng	15.510	15.510	0.000
Diazinon	Soil	µg	1.586	1.495	0.091
Dicamba	Soil	ng	382.174	382.174	0.000
Dichlorprop	Soil	ng	33.148	33.148	0.000
Dichlorprop-P	Soil	µg	74.360	68.216	6.144
Diclofop	Soil	ng	178.461	178.461	0.000
Diclofop-methyl	Soil	ng	181.081	181.081	0.000
Dicrotophos	Soil	ng	206.964	206.964	0.000
Difenoconazole	Soil	µg	3.149	3.149	0.000
Diflubenzuron	Soil	µg	7.323	7.323	0.000
Diflufenican	Soil	ng	393.813	393.813	0.000

Diflufenzopyr-sodium	Soil	ng	23.590	23.590	0.000
Dimethachlor	Soil	ng	78.831	78.831	0.000
Dimethenamid	Soil	ng	937.632	937.632	0.000
Dimethoate	Soil	µg	2.811	2.748	0.063
Dimethomorph	Soil	ng	107.012	104.637	2.375
Dipropylthiocarbamic acid S-ethyl ester	Soil	µg	11.906	10.922	0.984
Diquat	Soil	µg	2.435	2.245	0.190
Dithianone	Soil	ng	3.528	3.528	0.000
Diuron	Soil	µg	32.237	32.237	0.000
Endosulfan	Soil	µg	3.199	3.117	0.082
Endothall	Soil	ng	431.441	430.661	0.780
Epoxiconazole	Soil	ng	42.421	42.421	0.000
Esfenvalerate	Soil	ng	163.007	149.551	13.456
Ethalfluralin	Soil	µg	13.723	13.723	0.001
Ethephon	Soil	ng	973.009	973.009	0.000
Ethofumesate	Soil	µg	1.003	1.003	0.000
Ethoprop	Soil	µg	2.758	2.530	0.228
Fenamiphos	Soil	ng	680.680	680.680	0.000
Fenbuconazole	Soil	ng	2.931	2.931	0.000
Fenoxaprop	Soil	µg	138.595	138.595	0.000
Fenoxaprop-P ethyl ester	Soil	ng	13.007	13.007	0.000
Fenoxaprop ethyl ester	Soil	ng	14.872	14.872	0.000
Fenpiclonil	Soil	µg	159.832	159.807	0.025
Fenpropathrin	Soil	pg	583.866	583.866	0.000
Fenpropidin	Soil	ng	412.628	412.628	0.000
Fenpropimorph	Soil	ng	517.399	517.399	0.000
Fentin hydroxide	Soil	ng	477.310	437.865	39.445
Fipronil	Soil	µg	1.272	1.272	0.000
Florasulam	Soil	ng	2.892	2.892	0.000
Fluazifop	Soil	ng	31.437	31.437	0.000
Fluazifop-P-butyl	Soil	µg	46.475	46.475	0.000
Flucarbazone sodium salt	Soil	pg	31.748	31.748	0.000
Fludioxonil	Soil	ng	60.710	60.710	0.000
Flufenacet	Soil	ng	117.661	117.661	0.000
Flumetsulam	Soil	ng	41.303	41.303	0.000
Flumiclorac-pentyl	Soil	pg	32.401	32.401	0.000
Flumioxazin	Soil	µg	80.870	80.870	0.000
Flupyrsulfuron-methyl	Soil	pg	49.288	49.288	0.000
Fluquinconazole	Soil	pg	801.870	801.870	0.000
Fluroxypyr	Soil	ng	27.319	27.319	0.000
Flurtamone	Soil	ng	167.930	167.930	0.000
Flusilazole	Soil	ng	16.225	16.225	0.000
Flutolanil	Soil	ng	542.755	497.902	44.854
Folpet	Soil	ng	108.444	108.444	0.000
Fomesafen	Soil	µg	530.962	530.961	0.001
Foramsulfuron	Soil	ng	4.423	4.423	0.000
Fosetyl-aluminium	Soil	µg	2.376	2.376	0.000
Fungicides, unspecified	Soil	µg	1.463	1.463	0.000
Furathiocarb	Soil	ng	112.083	112.083	0.000
Glufosinate	Soil	µg	1.145	1.126	0.020
Glyphosate	Soil	mg	171.622	171.621	0.001
Halosulfuron-methyl	Soil	pg	310.053	310.053	0.000
Herbicides, unspecified	Soil	ng	390.108	390.108	0.000
Hexaconazole	Soil	ng	533.308	533.308	0.000

Hexazinone	Soil	ng	114.076	114.076	0.000
Hydramethylnon	Soil	ng	2.629	2.629	0.000
Imazamox	Soil	µg	69.434	69.433	0.000
Imazapyr	Soil	pg	589.773	589.773	0.000
Imazaquin	Soil	pg	154.548	154.548	0.000
Imazethapyr	Soil	µg	173.450	173.449	0.000
Imidacloprid	Soil	µg	2.937	2.872	0.065
Indoxacarb	Soil	ng	800.256	800.256	0.000
Insecticides, unspecified	Soil	ng	92.624	92.624	0.000
Iodosulfuron	Soil	pg	53.458	53.458	0.000
Iodosulfuron-methyl-sodium	Soil	pg	30.756	30.756	0.000
Ioxynil	Soil	ng	275.547	275.547	0.000
Iprodione	Soil	µg	11.689	11.609	0.080
Iron	Soil	g	3.072	3.073	-0.001
Isoproturon	Soil	µg	1.653	1.653	0.000
Isoxaflutole	Soil	ng	134.864	134.864	0.000
Kaolin	Soil	ng	88.702	88.702	0.000
Kresoxim-methyl	Soil	ng	21.200	21.200	0.000
Lactofen	Soil	pg	155.639	155.639	0.000
Lambda-cyhalothrin	Soil	µg	23.196	23.196	0.000
Lead	Soil	mg	7.913	7.915	-0.002
Lenacil	Soil	ng	67.293	67.293	0.000
Linuron	Soil	µg	48.342	48.289	0.053
Magnesium	Soil	g	3.733	3.734	-0.001
Malathion	Soil	ng	217.206	213.609	3.597
Maleic hydrazide	Soil	µg	3.017	2.768	0.249
Mancozeb	Soil	µg	109.713	105.464	4.249
Mandipropamid	Soil	pg	77.160	77.160	0.000
Maneb	Soil	ng	70.239	64.434	5.805
Manganese	Soil	g	2.315	2.316	-0.001
MCPB	Soil	ng	421.179	421.179	0.000
Mecoprop	Soil	ng	29.001	29.001	0.000
Mecoprop-P	Soil	ng	113.125	113.125	0.000
Mefenpyr	Soil	ng	29.904	29.904	0.000
Mefenpyr-diethyl	Soil	ng	15.614	15.614	0.000
Mepiquat chloride	Soil	ng	138.680	138.680	0.000
Mercury	Soil	µg	16.224	16.227	-0.003
Mesosulfuron-methyl (prop)	Soil	pg	169.657	169.657	0.000
Mesotrione	Soil	ng	191.681	191.681	0.000
Metalaxil	Soil	µg	1.560	1.432	0.128
Metalaxyl-M	Soil	µg	35.569	35.569	0.000
Metaldehyde	Soil	µg	2.243	2.243	0.000
Metam-sodium dihydrate	Soil	µg	491.336	450.733	40.602
Metamitron	Soil	µg	3.535	3.535	0.000
Metazachlor	Soil	ng	812.850	812.850	0.000
Metconazole	Soil	ng	9.573	9.573	0.000
Methiocarb	Soil	ng	9.661	9.661	0.000
Methomyl	Soil	pg	0.429	0.429	0.000
Methoxyfenozide	Soil	ng	110.702	110.702	0.000
Metiram	Soil	µg	2.050	1.880	0.169
Metolachlor	Soil	mg	1.495	1.495	0.000
Metosulam	Soil	pg	97.178	97.178	0.000
Metribuzin	Soil	µg	562.282	561.866	0.416
Metsulfuron-methyl	Soil	ng	51.475	51.475	0.000

Mineral oil	Soil	µg	53.296	53.296	0.000
Molinate	Soil	ng	92.912	92.912	0.000
Molybdenum	Soil	µg	443.552	443.658	-0.107
Monocrotophos	Soil	ng	887.967	887.967	0.000
Monosodium acid methanearsonate	Soil	ng	105.592	105.592	0.000
Myclobutanil	Soil	ng	101.248	101.248	0.000
Napropamide	Soil	µg	1.495	1.495	0.000
Nickel	Soil	mg	5.441	5.441	0.000
Nicosulfuron	Soil	ng	32.437	32.437	0.000
Norflurazon	Soil	ng	155.126	155.126	0.000
Oils, unspecified	Soil	ng	841.896	841.896	0.000
Orbencarb	Soil	µg	10.213	10.084	0.129
Oryzalin	Soil	ng	153.993	153.993	0.000
Oxamyl	Soil	µg	2.314	2.123	0.191
Oxydemeton methyl	Soil	ng	3.740	3.740	0.000
Oxyfluorfen	Soil	µg	1.513	1.513	0.000
Paraquat	Soil	µg	3.597	3.584	0.013
Parathion	Soil	ng	352.875	352.863	0.012
Parathion, methyl	Soil	pg	124.649	124.649	0.000
Pendimethalin	Soil	mg	4.034	4.034	0.000
Permethrin	Soil	ng	109.151	101.236	7.915
Pesticides, unspecified	Soil	µg	11.926	11.926	0.000
Phenmedipham	Soil	ng	655.972	655.972	0.000
Phorate	Soil	µg	4.987	4.575	0.412
Phosmet	Soil	ng	583.997	538.615	45.382
Phosphorus	Soil	g	1.134	1.134	0.000
Picloram	Soil	pg	63.495	63.495	0.000
Picoxystrobin	Soil	ng	38.580	38.580	0.000
Piperonyl butoxide	Soil	ng	34.059	32.707	1.352
Pirimicarb	Soil	µg	222.048	222.048	0.000
Pirimiphos methyl	Soil	ng	423.367	423.367	0.000
Potassium	Soil	g	6.307	6.309	-0.002
Primisulfuron	Soil	ng	14.745	14.745	0.000
Prochloraz	Soil	ng	11.259	11.259	0.000
Procymidone	Soil	ng	12.593	12.593	0.000
Profenofos	Soil	ng	164.317	164.317	0.000
Prohexadione-calcium	Soil	pg	38.259	38.259	0.000
Prometryn	Soil	ng	88.192	88.192	0.000
Pronamide	Soil	pg	290.101	290.101	0.000
Propachlor	Soil	µg	4.155	4.155	0.000
Propamocarb HCl	Soil	ng	23.945	21.966	1.979
Propanil	Soil	ng	240.640	240.640	0.000
Propargite	Soil	µg	1.600	1.467	0.132
Propiconazole	Soil	ng	148.862	148.862	0.000
Propoxycarbazone-sodium (prop)	Soil	pg	212.109	212.109	0.000
Prosulfuron	Soil	ng	6.605	6.605	0.000
Prothioconazol	Soil	ng	37.568	37.568	0.000
Pymetrozine	Soil	ng	153.251	140.587	12.665
Pyraclostrobin (prop)	Soil	µg	1.080	1.080	0.000
Pyrethrin	Soil	ng	19.662	19.662	0.000
Pyrimethanil	Soil	ng	155.723	155.723	0.000
Pyrithiobac sodium salt	Soil	ng	5.902	5.902	0.000
Quinclorac	Soil	ng	4.019	4.019	0.000
Quinoxyfen	Soil	ng	1.855	1.855	0.000

Quizalofop-P	Soil	ng	945.883	945.834	0.049
Quizalofop-p-ethyl	Soil	ng	131.769	131.769	0.000
Quizalofop ethyl ester	Soil	ng	1.650	1.650	0.000
Rimsulfuron	Soil	ng	88.205	82.136	6.069
Rotenone	Soil	ng	11.010	11.010	0.000
Sethoxydim	Soil	µg	4.329	4.323	0.005
Silicon	Soil	g	9.654	9.656	-0.002
Silthiofam	Soil	ng	2.851	2.851	0.000
Silver	Soil	pg	0.013	0.013	0.000
Simazine	Soil	ng	968.765	968.765	0.000
Spinosad	Soil	ng	13.312	13.049	0.264
Spiroxamine	Soil	ng	52.713	52.713	0.000
Strontium	Soil	µg	132.312	130.154	2.158
Sulfentrazone	Soil	µg	833.201	833.200	0.001
Sulfosate	Soil	mg	3.431	3.431	0.000
Sulfosulfuron	Soil	pg	761.938	761.938	0.000
Sulfur	Soil	g	1.115	1.115	0.000
Sulfuric acid	Soil	µg	562.768	516.261	46.507
Tebuconazole	Soil	ng	145.260	145.260	0.000
Tebupirimphos	Soil	ng	123.858	123.858	0.000
Tebutam	Soil	µg	5.956	5.956	0.000
Teflubenzuron	Soil	ng	126.080	124.490	1.590
Tefluthrin	Soil	ng	98.075	98.075	0.000
Terbacil	Soil	µg	1.527	1.527	0.000
Terbufos	Soil	µg	4.631	4.631	0.000
Thiamethoxam	Soil	µg	2.229	2.217	0.012
Thiazole, 2-(thiocyanatemethylthio)benzo-	Soil	µg	46.498	42.656	3.843
Thidiazuron	Soil	ng	10.339	10.339	0.000
Thifensulfuron-methyl	Soil	pg	606.222	606.222	0.000
Thiobencarb	Soil	ng	51.503	51.503	0.000
Thiodicarb	Soil	pg	39.464	39.464	0.000
Thiram	Soil	µg	99.578	99.577	0.001
Tin	Soil	µg	64.054	64.050	0.003
Titanium	Soil	mg	159.700	159.740	-0.040
Tralkoxydim	Soil	ng	266.850	266.850	0.000
Triadimenol	Soil	ng	2.372	2.372	0.000
Triallate	Soil	ng	1.714	1.714	0.000
Triasulfuron	Soil	pg	507.970	507.970	0.000
Tribenuron	Soil	pg	201.536	201.536	0.000
Tribenuron-methyl	Soil	ng	6.746	6.746	0.000
Tribufos	Soil	ng	96.690	96.690	0.000
Trichlorfon	Soil	ng	2.395	2.197	0.198
Triclopyr	Soil	µg	1.852	1.852	0.000
Trifloxystrobin	Soil	ng	22.381	22.381	0.000
Trifluralin	Soil	mg	4.858	4.858	0.000
Triforine	Soil	ng	32.758	32.758	0.000
Trinexapac-ethyl	Soil	ng	234.947	234.947	0.000
Vanadium	Soil	mg	4.571	4.572	-0.001
Vinclozolin	Soil	ng	4.198	4.198	0.000
Zeta-cypermethrin	Soil	pg	46.630	46.630	0.000
Zinc	Soil	mg	178.412	178.456	-0.044
Oils, biogenic	Soil	mg	166.990	166.967	0.023
Oils, unspecified	Soil	g	223.395	220.158	3.237
Aluminium	Soil	µg	37.333	37.895	-0.563

Arsenic	Soil	ng	14.933	15.158	-0.225
Barium	Soil	µg	18.666	18.948	-0.281
Boron	Soil	ng	373.326	378.955	-5.629
Cadmium	Soil	ng	133.006	133.006	0.000
Calcium	Soil	µg	240.611	242.862	-2.252
Carbon	Soil	mg	1.240	1.242	-0.002
Chloride	Soil	µg	130.665	132.635	-1.970
Chromium	Soil	ng	186.664	189.478	-2.814
Cobalt	Soil	ng	264.709	264.709	0.000
Copper	Soil	µg	97.803	97.636	0.166
Fluoride	Soil	µg	1.867	1.895	-0.028
Glyphosate	Soil	ng	262.664	264.429	-1.765
Heat, waste	Soil	MJ	23.353	0.239	23.113
Iron	Soil	µg	74.665	75.791	-1.126
Lead	Soil	µg	5.972	5.972	0.000
Magnesium	Soil	µg	29.866	30.317	-0.450
Manganese	Soil	µg	1.493	1.516	-0.023
Mercury	Soil	ng	26.471	26.471	0.000
Nickel	Soil	µg	1.995	1.995	0.000
Nitrogen	Soil	µg	13.301	13.301	0.000
Oils, biogenic	Soil	µg	1.189	1.189	0.000
Oils, unspecified	Soil	mg	44.482	44.465	0.017
Phosphorus	Soil	µg	8.100	8.128	-0.028
Potassium	Soil	µg	13.067	13.264	-0.197
Silicon	Soil	µg	3.733	3.790	-0.056
Sodium	Soil	µg	74.665	75.791	-1.126
Strontium	Soil	ng	373.326	378.955	-5.629
Sulfur	Soil	µg	29.037	29.375	-0.338
Zinc	Soil	µg	13.861	13.869	-0.008

Appendix 3

Full Life-Cycle Inventory for Incinerated Thermally-Modified Wood Decking

Substance	Compartment	Unit	Total	Thermally-modified deck (20' x 16')	Incineration scenario for thermally-modified wood deck
Carbon dioxide, in air	Raw	kg	433.575	433.575	0.000
Coal, 26.4 MJ per kg	Raw	g	11.619	11.619	0.000
Electricity usage	Raw	MJ	278.055	276.464	1.590
Gas, natural, 46.8 MJ per kg	Raw	g	114.738	114.738	0.000
Limestone	Raw	kg	4.212	4.212	0.000
Oil, crude, 42 MJ per kg	Raw	g	517.775	517.775	0.000
Uranium, 2291 GJ per kg	Raw	mg	1.743	1.743	0.000
Water, process and cooling, unspecified natural origin	Raw	dm3	363.414	363.414	0.000
Water, well, in ground	Raw	dm3	76.988	76.988	0.000
Water, well, in ground, US	Raw	cm3	632.692	523.479	109.213
Wood and wood waste, 20.9 MJ per kg, ovendry basis	Raw	kg	36.527	36.527	0.000
Wood, soft, NE-NC, standing	Raw	dm3	527.014	527.014	0.000
Energy, gross calorific value, in biomass	Raw	MMBTU	1.007	1.007	0.000
Energy, gross calorific value, in biomass, primary forest	Raw	MJ	2.701	2.701	0.000
Peat	Raw	g	5.063	5.062	0.000
Wood, hard, standing	Raw	fl. oz	945.439	945.432	0.008
Wood, primary forest, standing	Raw	cm3	249.843	249.842	0.000
Wood, soft, standing	Raw	dm3	73.203	73.202	0.001
Wood, unspecified, standing/m3	Raw	mm3	9.979	9.954	0.026
Argon	Raw	g	9.984	9.984	0.000
Carbon dioxide, in air	Raw	kg	95.693	95.678	0.016
Energy, kinetic (in wind), converted	Raw	MJ	10.313	10.232	0.081
Energy, solar, converted	Raw	kJ	466.405	456.089	10.316
Krypton	Raw	µg	17.931	17.931	0.000
Nitrogen	Raw	g	538.446	538.446	0.000
Oxygen	Raw	g	188.754	188.754	0.000
Xenon	Raw	µg	2.104	2.104	0.000
Aluminium	Raw	g	8.598	8.502	0.096
Anhydrite	Raw	mg	4.139	4.135	0.003
Barite	Raw	mg	728.932	432.309	296.623
Basalt	Raw	mg	175.181	173.085	2.096
Borax	Raw	µg	933.933	931.832	2.101
Cadmium	Raw	mg	9.506	9.503	0.003
Calcite	Raw	kg	1.953	1.690	0.263
Carbon, organic, in soil or biomass stock	Raw	g	39.113	39.113	0.000
Cerium	Raw	µg	88.132	88.132	0.000
Chromium	Raw	g	108.548	108.382	0.166
Chrysotile	Raw	mg	7.922	4.864	3.058
Cinnabar	Raw	µg	698.944	415.031	283.914
Clay	Raw	g	86.895	3.396	83.499
Clay, bentonite	Raw	g	45.748	45.737	0.010
Clay, unspecified	Raw	g	27.878	27.878	0.000
Coal, 26.4 MJ per kg	Raw	kg	19.996	19.627	0.368
Coal, brown	Raw	g	417.903	415.082	2.821
Coal, hard	Raw	kg	23.791	23.687	0.104
Cobalt	Raw	µg	894.929	892.696	2.233
Cobalt, Co 5.0E-2%, in mixed ore	Raw	µg	78.418	78.418	0.000
Colemanite	Raw	g	1.052	1.052	0.000
Copper, 0.52% in sulfide, Cu 0.27% and Mo 8.2E-3% in crude ore	Raw	g	6.005	6.005	0.000
Copper, 0.59% in sulfide, Cu 0.22% and Mo 8.2E-3% in crude ore	Raw	g	8.430	8.430	0.000
Copper, 0.97% in sulfide, Cu 0.36% and Mo 4.1E-2% in crude ore	Raw	g	9.035	9.035	0.000
Copper, 0.99% in sulfide, Cu 0.36% and Mo 8.2E-3% in crude ore	Raw	mg	73.068	72.544	0.523
Copper, 1.13% in sulfide, Cu 0.76% and Ni 0.76% in crude ore	Raw	mg	46.406	46.406	0.000
Copper, 1.18% in sulfide, Cu 0.39% and Mo 8.2E-3% in crude ore	Raw	g	9.979	9.976	0.003
Copper, 1.42% in sulfide, Cu 0.81% and Mo 8.2E-3% in crude ore	Raw	mg	6.871	6.117	0.754

Copper, 2.19% in sulfide, Cu 1.83% and Mo 8.2E-3% in crude ore	Raw	mg	32.021	28.245	3.776
Copper, Cu 0.2%, in mixed ore	Raw	µg	192.067	192.067	0.000
Copper, Cu 0.38%, Au 9.7E-4%, Ag 9.7E-4%, Zn 0.63%, Pb 0.014%, in ore	Raw	mg	62.111	62.111	0.000
Copper, Cu 3.2E+0%, Pt 2.5E-4%, Pd 7.3E-4%, Rh 2.0E-5%, Ni 2.3E+0% in ore	Raw	mg	1.066	1.066	0.000
Copper, Cu 5.2E-2%, Pt 4.8E-4%, Pd 2.0E-4%, Rh 2.4E-5%, Ni 3.7E-2% in ore	Raw	mg	36.208	36.208	0.000
Diatomite	Raw	µg	34.175	34.173	0.001
Dolomite	Raw	g	82.877	82.876	0.001
Energy, geothermal, converted	Raw	kJ	78.336	78.336	0.000
Europium	Raw	ng	220.801	220.801	0.000
Feldspar	Raw	µg	441.461	441.458	0.003
Fluorine	Raw	mg	850.075	847.149	2.927
Fluorine, 4.5% in apatite, 3% in crude ore	Raw	g	1.015	1.014	0.001
Fluorspar	Raw	g	4.019	3.931	0.087
Gadolinium	Raw	ng	551.059	551.059	0.000
Gallium	Raw	ng	2.476	2.430	0.046
Gangue, bauxite	Raw	g	69.331	69.331	0.000
Gas, mine, off-gas, process, coal mining/m3	Raw	dm3	163.086	162.303	0.783
Gas, natural/m3	Raw	m3	14.120	12.994	1.126
Gold	Raw	µg	19.231	19.169	0.062
Gold, Au 1.0E-7%, in mixed ore	Raw	ng	16.177	16.177	0.000
Gold, Au 1.1E-4%, Ag 4.2E-3%, in ore	Raw	µg	4.519	4.490	0.028
Gold, Au 1.3E-4%, Ag 4.6E-5%, in ore	Raw	µg	6.511	6.459	0.052
Gold, Au 1.8E-4%, in mixed ore	Raw	ng	229.243	229.243	0.000
Gold, Au 2.1E-4%, Ag 2.1E-4%, in ore	Raw	µg	1.552	1.457	0.095
Gold, Au 4.3E-4%, in ore	Raw	µg	3.773	3.749	0.024
Gold, Au 4.9E-5%, in ore	Raw	µg	18.819	18.763	0.056
Gold, Au 5.4E-4%, Ag 1.5E-5%, in ore	Raw	ng	169.908	169.908	0.000
Gold, Au 6.7E-4%, in ore	Raw	µg	20.119	20.032	0.087
Gold, Au 6.8E-4%, Ag 1.5E-4%, in ore	Raw	ng	230.889	230.889	0.000
Gold, Au 7.1E-4%, in ore	Raw	µg	9.412	9.313	0.098
Gold, Au 9.7E-4%, Ag 9.7E-4%, Zn 0.63%, Cu 0.38%, Pb 0.014%, in ore	Raw	µg	1.523	1.517	0.006
Gold, Au 9.7E-5%, Ag 7.6E-5%, in ore	Raw	ng	835.287	835.287	0.000
Granite	Raw	ng	239.272	239.215	0.057
Gravel	Raw	kg	1.180	1.151	0.029
Gypsum	Raw	g	2.495	2.495	0.000
Indium	Raw	µg	158.430	158.385	0.044
Iron	Raw	kg	3.988	3.988	0.000
Kaolinite	Raw	mg	239.058	238.188	0.871
Kieserite	Raw	mg	1.766	1.763	0.002
Lanthanum	Raw	µg	26.421	26.421	0.000
Lead	Raw	mg	157.870	157.705	0.164
Lead, Pb 0.014%, Au 9.7E-4%, Ag 9.7E-4%, Zn 0.63%, Cu 0.38%, in ore	Raw	mg	7.507	7.507	0.000
Lead, Pb 3.6E-1%, in mixed ore	Raw	µg	345.709	345.709	0.000
Lithium	Raw	mg	191.151	191.151	0.000
Magnesite	Raw	g	78.021	77.942	0.079
Manganese	Raw	g	77.584	77.583	0.001
Metamorphous rock, graphite containing	Raw	mg	41.622	41.541	0.081
Molybdenum	Raw	g	1.037	1.037	0.000
Molybdenum, 0.010% in sulfide, Mo 8.2E-3% and Cu 1.83% in crude ore	Raw	µg	805.249	735.082	70.167
Molybdenum, 0.014% in sulfide, Mo 8.2E-3% and Cu 0.81% in crude ore	Raw	µg	123.357	113.456	9.901
Molybdenum, 0.016% in sulfide, Mo 8.2E-3% and Cu 0.27% in crude ore	Raw	mg	143.978	143.978	0.000
Molybdenum, 0.022% in sulfide, Mo 8.2E-3% and Cu 0.22% in crude ore	Raw	mg	188.294	188.294	0.000
Molybdenum, 0.022% in sulfide, Mo 8.2E-3% and Cu 0.36% in crude ore	Raw	mg	4.521	4.509	0.012
Molybdenum, 0.025% in sulfide, Mo 8.2E-3% and Cu 0.39% in crude ore	Raw	mg	198.999	198.963	0.036
Neodymium	Raw	µg	14.531	14.531	0.000
Nickel, 1.13% in sulfide, Ni 0.76% and Cu 0.76% in crude ore	Raw	mg	186.133	113.385	72.748

Nickel, 1.98% in silicates, 1.04% in crude ore	Raw	g	69.346	69.323	0.023
Nickel, Ni 2.3E+0%, Pt 2.5E-4%, Pd 7.3E-4%, Rh 2.0E-5%, Cu 3.2E+0% in ore	Raw	mg	24.409	24.409	0.000
Nickel, Ni 2.5E+0%, in mixed ore	Raw	mg	3.842	3.842	0.000
Nickel, Ni 3.7E-2%, Pt 4.8E-4%, Pd 2.0E-4%, Rh 2.4E-5%, Cu 5.2E-2% in ore	Raw	mg	3.418	3.418	0.000
Oil, crude	Raw	kg	90.223	84.496	5.727
Olivine	Raw	mg	1.464	1.463	0.001
Palladium, Pd 1.6E-6%, in mixed ore	Raw	ng	256.707	256.707	0.000
Palladium, Pd 2.0E-4%, Pt 4.8E-4%, Rh 2.4E-5%, Ni 3.7E-2%, Cu 5.2E-2% in ore	Raw	µg	883.490	883.327	0.163
Palladium, Pd 7.3E-4%, Pt 2.5E-4%, Rh 2.0E-5%, Ni 2.3E+0%, Cu 3.2E+0% in ore	Raw	mg	2.115	2.114	0.000
Perlite	Raw	mg	2.861	2.861	0.000
Phosphorus	Raw	g	4.085	4.080	0.005
Phosphorus, 18% in apatite, 4% in crude ore	Raw	g	3.400	3.389	0.012
Platinum, Pt 2.5E-4%, Pd 7.3E-4%, Rh 2.0E-5%, Ni 2.3E+0%, Cu 3.2E+0% in ore	Raw	µg	22.820	22.816	0.004
Platinum, Pt 4.7E-7%, in mixed ore	Raw	ng	74.254	74.254	0.000
Platinum, Pt 4.8E-4%, Pd 2.0E-4%, Rh 2.4E-5%, Ni 3.7E-2%, Cu 5.2E-2% in ore	Raw	µg	88.034	88.019	0.014
Potassium chloride	Raw	g	32.126	32.126	0.000
Praseodymium	Raw	µg	1.542	1.542	0.000
Pumice	Raw	mg	195.024	195.024	0.000
Rhenium	Raw	µg	46.071	46.066	0.005
Rhodium, Rh 1.6E-7%, in mixed ore	Raw	ng	25.193	25.193	0.000
Rhodium, Rh 2.0E-5%, Pt 2.5E-4%, Pd 7.3E-4%, Ni 2.3E+0%, Cu 3.2E+0% in ore	Raw	µg	20.256	20.252	0.004
Rhodium, Rh 2.4E-5%, Pt 4.8E-4%, Pd 2.0E-4%, Ni 3.7E-2%, Cu 5.2E-2% in ore	Raw	µg	63.570	63.558	0.011
Samarium	Raw	µg	1.100	1.100	0.000
Sand	Raw	mg	119.566	119.457	0.109
Shale	Raw	mg	662.358	662.348	0.010
Silver, 0.007% in sulfide, Ag 0.004%, Pb, Zn, Cd, In	Raw	µg	230.707	230.078	0.629
Silver, 3.2ppm in sulfide, Ag 1.2ppm, Cu and Te, in crude ore	Raw	ng	797.397	348.834	448.564
Silver, Ag 1.5E-4%, Au 6.8E-4%, in ore	Raw	ng	51.823	51.823	0.000
Silver, Ag 1.5E-5%, Au 5.4E-4%, in ore	Raw	ng	4.744	4.744	0.000
Silver, Ag 1.8E-6%, in mixed ore	Raw	ng	286.408	286.408	0.000
Silver, Ag 2.1E-4%, Au 2.1E-4%, in ore	Raw	µg	1.488	1.447	0.041
Silver, Ag 4.2E-3%, Au 1.1E-4%, in ore	Raw	µg	167.644	167.550	0.095
Silver, Ag 4.6E-5%, Au 1.3E-4%, in ore	Raw	µg	2.449	2.356	0.093
Silver, Ag 5.4E-3%, in mixed ore	Raw	µg	5.226	5.226	0.000
Silver, Ag 7.6E-5%, Au 9.7E-5%, in ore	Raw	ng	654.443	654.443	0.000
Silver, Ag 9.7E-4%, Au 9.7E-4%, Zn 0.63%, Cu 0.38%, Pb 0.014%, in ore	Raw	µg	76.638	76.577	0.061
Sodium chloride	Raw	g	293.411	186.989	106.422
Sodium nitrate	Raw	ng	10.088	10.016	0.072
Sodium sulfate	Raw	mg	437.859	413.334	24.525
Spodumene	Raw	µg	133.642	133.642	0.000
Stibnite	Raw	µg	3.551	3.551	0.000
Strontium	Raw	µg	177.088	177.088	0.000
Sulfur	Raw	mg	968.835	968.717	0.118
Talc	Raw	mg	27.826	27.411	0.415
Tantalum	Raw	mg	2.497	2.497	0.000
Tellurium	Raw	ng	119.613	52.327	67.286
Tin	Raw	mg	3.899	3.876	0.023
TiO2, 54% in ilmenite, 18% in crude ore	Raw	mg	17.192	17.192	0.000
TiO2, 54% in ilmenite, 2.6% in crude ore	Raw	g	8.516	2.101	6.415
TiO2, 95% in rutile, 0.40% in crude ore	Raw	mg	35.661	35.661	0.000
Ulexite	Raw	µg	839.873	837.562	2.311
Uranium	Raw	mg	473.179	470.589	2.590
Uranium oxide, 332 GJ per kg, in ore	Raw	mg	488.426	479.531	8.894
Vermiculite	Raw	mg	65.639	65.639	0.000
Volume occupied, final repository for low-active radioactive waste	Raw	mm3	755.342	751.484	3.858
Volume occupied, final repository for radioactive waste	Raw	mm3	144.439	143.628	0.811

Volume occupied, underground deposit	Raw	cm3	1.401	1.384	0.017
Water, unspecified natural origin, BR	Raw	mm3	2.614	2.614	0.000
Water, unspecified natural origin, CH	Raw	mm3	26.842	26.842	0.000
Water, unspecified natural origin, CN	Raw	mm3	0.000	0.000	0.000
Water, unspecified natural origin, CO	Raw	mm3	1.489	1.489	0.000
Water, unspecified natural origin, DE	Raw	mm3	0.000	0.000	0.000
Water, unspecified natural origin, Europe without Switzerland	Raw	mm3	0.000	0.000	0.000
Water, unspecified natural origin, GLO	Raw	mm3	3.853	3.853	0.000
Water, unspecified natural origin, HN	Raw	mm3	1.009	1.009	0.000
Water, unspecified natural origin, ID	Raw	mm3	2.427	2.427	0.000
Water, unspecified natural origin, IN	Raw	mm3	1.062	1.062	0.000
Water, unspecified natural origin, RER	Raw	mm3	7.180	7.180	0.000
Water, unspecified natural origin, RNA	Raw	mm3	0.000	0.000	0.000
Water, unspecified natural origin, RoW	Raw	mm3	35.620	35.620	0.000
Water, unspecified natural origin, US	Raw	mm3	0.002	0.002	0.000
Water, unspecified natural origin, VN	Raw	mm3	4.641	4.641	0.000
Zinc	Raw	g	1.219	1.216	0.002
Zinc, Zn 0.63%, Au 9.7E-4%, Ag 9.7E-4%, Cu 0.38%, Pb 0.014%, in ore	Raw	mg	9.731	9.731	0.000
Zinc, Zn 3.1%, in mixed ore	Raw	mg	2.967	2.967	0.000
Zirconium	Raw	mg	34.626	34.626	0.001
Bromine	Raw	g	35.741	35.741	0.000
Carnallite	Raw	mg	35.065	35.065	0.000
Energy, potential (in hydropower reservoir), converted	Raw	MJ	29.693	29.554	0.139
Iodine	Raw	g	2.916	2.916	0.000
Magnesium	Raw	ng	287.414	103.800	183.614
Volume occupied, reservoir	Raw	m3day	90.916	90.507	0.409
Water, cooling, unspecified natural origin, AT	Raw	cm3	395.614	395.614	0.000
Water, cooling, unspecified natural origin, AU	Raw	cu.in	131.467	131.467	0.000
Water, cooling, unspecified natural origin, BA	Raw	cm3	100.260	100.260	0.000
Water, cooling, unspecified natural origin, BE	Raw	cu.in	66.306	66.306	0.000
Water, cooling, unspecified natural origin, BG	Raw	cm3	599.477	599.477	0.000
Water, cooling, unspecified natural origin, BR	Raw	cu.in	78.641	78.641	0.000
Water, cooling, unspecified natural origin, CA	Raw	cu.in	254.610	254.610	0.000
Water, cooling, unspecified natural origin, CH	Raw	cm3	879.766	879.766	0.000
Water, cooling, unspecified natural origin, CL	Raw	cm3	377.113	377.113	0.000
Water, cooling, unspecified natural origin, CN	Raw	dm3	34.837	34.837	0.000
Water, cooling, unspecified natural origin, CY	Raw	cm3	47.507	47.507	0.000
Water, cooling, unspecified natural origin, CZ	Raw	cu.in	316.812	316.812	0.000
Water, cooling, unspecified natural origin, DE	Raw	cu.in	459.442	459.442	0.000
Water, cooling, unspecified natural origin, DK	Raw	cm3	254.249	254.249	0.000
Water, cooling, unspecified natural origin, EE	Raw	cm3	165.549	165.549	0.000
Water, cooling, unspecified natural origin, ES	Raw	cu.in	161.384	161.384	0.000
Water, cooling, unspecified natural origin, Europe without Switzerland	Raw	cm3	427.186	427.186	0.000
Water, cooling, unspecified natural origin, FI	Raw	cm3	578.710	578.710	0.000
Water, cooling, unspecified natural origin, FR	Raw	cu.in	472.530	472.530	0.000
Water, cooling, unspecified natural origin, GB	Raw	cu.in	202.543	202.543	0.000
Water, cooling, unspecified natural origin, GLO	Raw	cu.in	256.789	256.789	0.000
Water, cooling, unspecified natural origin, GR	Raw	cu.in	98.338	98.338	0.000
Water, cooling, unspecified natural origin, HR	Raw	cm3	120.831	120.831	0.000
Water, cooling, unspecified natural origin, HU	Raw	cm3	574.157	574.157	0.000
Water, cooling, unspecified natural origin, ID	Raw	cu.in	112.057	112.057	0.000
Water, cooling, unspecified natural origin, IE	Raw	cm3	233.982	233.982	0.000
Water, cooling, unspecified natural origin, IN	Raw	cu.in	594.972	594.972	0.000
Water, cooling, unspecified natural origin, IR	Raw	cu.in	180.162	180.162	0.000
Water, cooling, unspecified natural origin, IS	Raw	mm3	49.573	49.573	0.000
Water, cooling, unspecified natural origin, IT	Raw	cu.in	152.468	152.468	0.000

Water, cooling, unspecified natural origin, JP	Raw	cu.in	392.651	392.651	0.000
Water, cooling, unspecified natural origin, KR	Raw	cu.in	287.617	287.617	0.000
Water, cooling, unspecified natural origin, LT	Raw	cm3	101.309	101.309	0.000
Water, cooling, unspecified natural origin, LU	Raw	cm3	43.749	43.749	0.000
Water, cooling, unspecified natural origin, LV	Raw	cm3	86.409	86.409	0.000
Water, cooling, unspecified natural origin, MA	Raw	cm3	1.284	1.284	0.000
Water, cooling, unspecified natural origin, MK	Raw	cm3	67.740	67.740	0.000
Water, cooling, unspecified natural origin, MT	Raw	cm3	37.463	37.463	0.000
Water, cooling, unspecified natural origin, MX	Raw	cu.in	129.009	129.009	0.000
Water, cooling, unspecified natural origin, MY	Raw	cu.in	67.724	67.724	0.000
Water, cooling, unspecified natural origin, NL	Raw	cu.in	78.854	78.854	0.000
Water, cooling, unspecified natural origin, NO	Raw	cm3	32.162	32.162	0.000
Water, cooling, unspecified natural origin, PE	Raw	cm3	205.464	205.464	0.000
Water, cooling, unspecified natural origin, PH	Raw	mm3	37.284	37.284	0.000
Water, cooling, unspecified natural origin, PL	Raw	cu.in	499.692	499.692	0.000
Water, cooling, unspecified natural origin, PT	Raw	cm3	349.443	349.443	0.000
Water, cooling, unspecified natural origin, RER	Raw	cu.in	919.839	919.839	0.000
Water, cooling, unspecified natural origin, RNA	Raw	mm3	0.534	0.534	0.000
Water, cooling, unspecified natural origin, RO	Raw	cm3	896.961	896.961	0.000
Water, cooling, unspecified natural origin, RoW	Raw	dm3	83.858	83.858	0.000
Water, cooling, unspecified natural origin, RS	Raw	cm3	409.668	409.668	0.000
Water, cooling, unspecified natural origin, RU	Raw	dm3	35.104	35.104	0.000
Water, cooling, unspecified natural origin, SA	Raw	cu.in	220.340	220.340	0.000
Water, cooling, unspecified natural origin, SE	Raw	cu.in	67.632	67.632	0.000
Water, cooling, unspecified natural origin, SI	Raw	cu.in	61.074	61.074	0.000
Water, cooling, unspecified natural origin, SK	Raw	cm3	986.242	986.242	0.000
Water, cooling, unspecified natural origin, TH	Raw	cu.in	72.273	72.273	0.000
Water, cooling, unspecified natural origin, TR	Raw	cu.in	102.730	102.730	0.000
Water, cooling, unspecified natural origin, TW	Raw	cu.in	110.891	110.891	0.000
Water, cooling, unspecified natural origin, TZ	Raw	cm3	48.559	48.559	0.000
Water, cooling, unspecified natural origin, UA	Raw	cu.in	175.782	175.782	0.000
Water, cooling, unspecified natural origin, US	Raw	m3	2.583	2.568	0.016
Water, cooling, unspecified natural origin, WEU	Raw	mm3	6.660	6.660	0.000
Water, cooling, unspecified natural origin, ZA	Raw	cu.in	136.586	136.586	0.000
Water, cooling, unspecified natural origin/m3	Raw	fl. oz	837.927	812.935	24.991
Water, lake	Raw	cm3	1.084	0.875	0.210
Water, lake, AT	Raw	mm3	0.057	0.057	0.000
Water, lake, BE	Raw	mm3	0.118	0.118	0.000
Water, lake, BG	Raw	mm3	0.208	0.208	0.000
Water, lake, CA	Raw	cm3	140.947	140.947	0.000
Water, lake, CH	Raw	cm3	7.470	7.470	0.000
Water, lake, CN	Raw	mm3	0.154	0.154	0.000
Water, lake, CZ	Raw	mm3	0.008	0.008	0.000
Water, lake, DE	Raw	mm3	1.643	1.643	0.000
Water, lake, DK	Raw	mm3	0.095	0.095	0.000
Water, lake, ES	Raw	mm3	0.083	0.083	0.000
Water, lake, Europe without Switzerland	Raw	cm3	7.919	7.919	0.000
Water, lake, FI	Raw	mm3	0.032	0.032	0.000
Water, lake, FR	Raw	mm3	0.253	0.253	0.000
Water, lake, GB	Raw	mm3	0.230	0.230	0.000
Water, lake, GLO	Raw	mm3	5.080	5.080	0.000
Water, lake, HU	Raw	mm3	0.032	0.032	0.000
Water, lake, IT	Raw	mm3	0.246	0.246	0.000
Water, lake, JP	Raw	mm3	0.408	0.408	0.000
Water, lake, KR	Raw	mm3	0.031	0.031	0.000
Water, lake, LU	Raw	mm3	0.005	0.005	0.000

Water, lake, NL	Raw	mm3	0.232	0.232	0.000
Water, lake, NO	Raw	mm3	0.013	0.013	0.000
Water, lake, PL	Raw	mm3	0.005	0.005	0.000
Water, lake, PT	Raw	mm3	0.029	0.029	0.000
Water, lake, RER	Raw	mm3	86.634	86.634	0.000
Water, lake, RNA	Raw	mm3	0.045	0.045	0.000
Water, lake, RoW	Raw	cm3	108.195	108.195	0.000
Water, lake, RU	Raw	mm3	0.158	0.158	0.000
Water, lake, SE	Raw	mm3	0.199	0.199	0.000
Water, lake, SK	Raw	mm3	0.003	0.003	0.000
Water, lake, TR	Raw	mm3	0.006	0.006	0.000
Water, lake, TW	Raw	mm3	0.152	0.152	0.000
Water, lake, US	Raw	cu.in	100.717	99.514	1.203
Water, river	Raw	cu.in	73.358	69.914	3.445
Water, river, AT	Raw	mm3	130.089	130.089	0.000
Water, river, AU	Raw	cm3	1.342	1.342	0.000
Water, river, BE	Raw	mm3	271.803	271.803	0.000
Water, river, BG	Raw	mm3	475.783	475.783	0.000
Water, river, BR	Raw	cm3	157.792	157.792	0.000
Water, river, CA	Raw	cm3	442.178	442.178	0.000
Water, river, CH	Raw	cm3	39.798	39.798	0.000
Water, river, CN	Raw	cm3	63.626	63.626	0.000
Water, river, CZ	Raw	mm3	17.636	17.636	0.000
Water, river, DE	Raw	cm3	22.522	22.522	0.000
Water, river, DK	Raw	mm3	217.339	217.339	0.000
Water, river, ES	Raw	cm3	2.163	2.163	0.000
Water, river, Europe without Switzerland	Raw	cm3	196.915	196.915	0.000
Water, river, FI	Raw	mm3	73.171	73.171	0.000
Water, river, FR	Raw	mm3	934.571	934.571	0.000
Water, river, GB	Raw	mm3	527.968	527.968	0.000
Water, river, GLO	Raw	cu.in	189.697	189.697	0.000
Water, river, HU	Raw	mm3	74.354	74.354	0.000
Water, river, IN	Raw	cm3	113.507	113.507	0.000
Water, river, IT	Raw	mm3	565.357	565.357	0.000
Water, river, JP	Raw	cm3	1.185	1.185	0.000
Water, river, KR	Raw	cm3	54.822	54.822	0.000
Water, river, LU	Raw	mm3	11.791	11.791	0.000
Water, river, MY	Raw	cm3	1.324	1.324	0.000
Water, river, NL	Raw	mm3	554.547	554.547	0.000
Water, river, NO	Raw	mm3	28.811	28.811	0.000
Water, river, PE	Raw	mm3	8.160	8.160	0.000
Water, river, PH	Raw	cm3	8.655	8.655	0.000
Water, river, PL	Raw	mm3	10.418	10.418	0.000
Water, river, PT	Raw	mm3	67.344	67.344	0.000
Water, river, RAS	Raw	cu.in	94.148	94.148	0.000
Water, river, RER	Raw	cu.in	155.478	155.478	0.000
Water, river, RLA	Raw	cm3	702.814	702.814	0.000
Water, river, RNA	Raw	cu.in	89.115	89.115	0.000
Water, river, RO	Raw	cm3	40.827	40.827	0.000
Water, river, RoW	Raw	cu.in	458.159	458.159	0.000
Water, river, RU	Raw	cm3	23.757	23.757	0.000
Water, river, SE	Raw	mm3	393.714	393.714	0.000
Water, river, SK	Raw	mm3	6.625	6.625	0.000
Water, river, TN	Raw	mm3	86.952	86.952	0.000
Water, river, TR	Raw	mm3	13.929	13.929	0.000
Water, river, TW	Raw	mm3	349.780	349.780	0.000

Water, river, TZ	Raw	mm3	124.733	124.733	0.000
Water, river, US	Raw	dm3	526.862	163.680	363.181
Water, river, WEU	Raw	mm3	0.001	0.001	0.000
Water, river, ZA	Raw	cm3	2.876	2.876	0.000
Water, salt, ocean	Raw	cu.in	934.955	931.838	3.117
Water, salt, sole	Raw	m3	15.591	15.591	0.000
Water, turbine use, unspecified natural origin	Raw	dm3	96.926	32.245	64.681
Water, turbine use, unspecified natural origin, AT	Raw	dm3	363.859	363.859	0.000
Water, turbine use, unspecified natural origin, AU	Raw	dm3	98.128	98.128	0.000
Water, turbine use, unspecified natural origin, BA	Raw	cu.in	302.272	302.272	0.000
Water, turbine use, unspecified natural origin, BE	Raw	cu.in	335.682	335.682	0.000
Water, turbine use, unspecified natural origin, BG	Raw	dm3	32.872	32.872	0.000
Water, turbine use, unspecified natural origin, BR	Raw	dm3	563.130	563.130	0.000
Water, turbine use, unspecified natural origin, CA	Raw	dm3	575.764	575.764	0.000
Water, turbine use, unspecified natural origin, CH	Raw	dm3	349.453	349.453	0.000
Water, turbine use, unspecified natural origin, CL	Raw	dm3	153.125	153.125	0.000
Water, turbine use, unspecified natural origin, CN	Raw	m3	6.949	6.949	0.000
Water, turbine use, unspecified natural origin, CZ	Raw	fl. oz	734.439	734.439	0.000
Water, turbine use, unspecified natural origin, DE	Raw	dm3	193.393	193.393	0.000
Water, turbine use, unspecified natural origin, DK	Raw	cm3	187.793	187.793	0.000
Water, turbine use, unspecified natural origin, EE	Raw	cm3	501.996	501.996	0.000
Water, turbine use, unspecified natural origin, ES	Raw	dm3	136.511	136.511	0.000
Water, turbine use, unspecified natural origin, FI	Raw	dm3	56.315	56.315	0.000
Water, turbine use, unspecified natural origin, FR	Raw	dm3	553.969	553.969	0.000
Water, turbine use, unspecified natural origin, GB	Raw	dm3	49.017	49.017	0.000
Water, turbine use, unspecified natural origin, GLO	Raw	cm3	1.850	1.850	0.000
Water, turbine use, unspecified natural origin, GR	Raw	dm3	37.469	37.469	0.000
Water, turbine use, unspecified natural origin, HR	Raw	cu.in	148.066	148.066	0.000
Water, turbine use, unspecified natural origin, HU	Raw	cu.in	139.040	139.040	0.000
Water, turbine use, unspecified natural origin, ID	Raw	fl. oz	613.182	613.182	0.000
Water, turbine use, unspecified natural origin, IE	Raw	cu.in	435.368	435.368	0.000
Water, turbine use, unspecified natural origin, IN	Raw	dm3	127.487	127.487	0.000
Water, turbine use, unspecified natural origin, IR	Raw	dm3	93.054	93.054	0.000
Water, turbine use, unspecified natural origin, IS	Raw	fl. oz	740.874	740.874	0.000
Water, turbine use, unspecified natural origin, IT	Raw	dm3	131.944	131.944	0.000
Water, turbine use, unspecified natural origin, JP	Raw	dm3	457.319	457.319	0.000
Water, turbine use, unspecified natural origin, KR	Raw	fl. oz	826.976	826.976	0.000
Water, turbine use, unspecified natural origin, LT	Raw	cu.in	235.673	235.673	0.000
Water, turbine use, unspecified natural origin, LU	Raw	cu.in	199.020	199.020	0.000
Water, turbine use, unspecified natural origin, LV	Raw	dm3	31.545	31.545	0.000
Water, turbine use, unspecified natural origin, MK	Raw	cu.in	118.128	118.128	0.000
Water, turbine use, unspecified natural origin, MX	Raw	dm3	246.323	246.323	0.000
Water, turbine use, unspecified natural origin, MY	Raw	fl. oz	832.238	832.238	0.000
Water, turbine use, unspecified natural origin, NL	Raw	cu.in	62.297	62.297	0.000
Water, turbine use, unspecified natural origin, NO	Raw	fl. oz	989.711	989.711	0.000
Water, turbine use, unspecified natural origin, PE	Raw	cu.in	179.666	179.666	0.000
Water, turbine use, unspecified natural origin, PL	Raw	fl. oz	771.927	771.927	0.000
Water, turbine use, unspecified natural origin, PT	Raw	dm3	38.236	38.236	0.000
Water, turbine use, unspecified natural origin, RER	Raw	cm3	46.706	46.706	0.000
Water, turbine use, unspecified natural origin, RNA	Raw	mm3	42.464	42.464	0.000
Water, turbine use, unspecified natural origin, RO	Raw	dm3	109.599	109.599	0.000
Water, turbine use, unspecified natural origin, RoW	Raw	m3	61.117	61.117	0.000
Water, turbine use, unspecified natural origin, RS	Raw	dm3	79.532	79.532	0.000
Water, turbine use, unspecified natural origin, RU	Raw	dm3	801.044	801.044	0.000
Water, turbine use, unspecified natural origin, SE	Raw	dm3	666.996	666.996	0.000
Water, turbine use, unspecified natural origin, SI	Raw	dm3	46.307	46.307	0.000

Water, turbine use, unspecified natural origin, SK	Raw	dm3	37.605	37.605	0.000
Water, turbine use, unspecified natural origin, TH	Raw	cu.in	712.919	712.919	0.000
Water, turbine use, unspecified natural origin, TR	Raw	dm3	262.438	262.438	0.000
Water, turbine use, unspecified natural origin, TW	Raw	dm3	41.611	41.611	0.000
Water, turbine use, unspecified natural origin, TZ	Raw	cu.in	145.108	145.108	0.000
Water, turbine use, unspecified natural origin, UA	Raw	dm3	92.614	92.614	0.000
Water, turbine use, unspecified natural origin, US	Raw	m3	220.764	219.415	1.349
Water, turbine use, unspecified natural origin, ZA	Raw	cu.in	195.065	195.065	0.000
Water, unspecified natural origin, AT	Raw	mm3	487.928	487.928	0.000
Water, unspecified natural origin, AU	Raw	mm3	11.914	11.914	0.000
Water, unspecified natural origin, BE	Raw	mm3	962.422	962.422	0.000
Water, unspecified natural origin, BG	Raw	cm3	1.565	1.565	0.000
Water, unspecified natural origin, BR	Raw	mm3	126.878	126.878	0.000
Water, unspecified natural origin, CA	Raw	cm3	1.914	1.914	0.000
Water, unspecified natural origin, CH	Raw	cm3	38.565	38.565	0.000
Water, unspecified natural origin, CL	Raw	mm3	0.995	0.995	0.000
Water, unspecified natural origin, CN	Raw	cm3	3.579	3.579	0.000
Water, unspecified natural origin, CZ	Raw	mm3	151.219	151.219	0.000
Water, unspecified natural origin, DE	Raw	cm3	5.342	5.342	0.000
Water, unspecified natural origin, DK	Raw	mm3	715.843	715.843	0.000
Water, unspecified natural origin, EE	Raw	mm3	18.956	18.956	0.000
Water, unspecified natural origin, ES	Raw	mm3	651.880	651.880	0.000
Water, unspecified natural origin, Europe without Switzerland	Raw	cm3	7.072	7.072	0.000
Water, unspecified natural origin, FI	Raw	mm3	253.887	253.887	0.000
Water, unspecified natural origin, FR	Raw	cm3	1.996	1.996	0.000
Water, unspecified natural origin, GB	Raw	cm3	1.759	1.759	0.000
Water, unspecified natural origin, GLO	Raw	cu.in	688.301	688.301	0.000
Water, unspecified natural origin, HU	Raw	mm3	247.626	247.626	0.000
Water, unspecified natural origin, IAI Area, Africa	Raw	mm3	250.176	250.176	0.000
Water, unspecified natural origin, IAI Area, Asia, without China and GCC	Raw	mm3	456.479	456.479	0.000
Water, unspecified natural origin, IAI Area, EU27 & EFTA	Raw	cm3	2.731	2.731	0.000
Water, unspecified natural origin, IAI Area, Gulf Cooperation Council	Raw	mm3	550.538	550.538	0.000
Water, unspecified natural origin, IAI Area, North America, without Quebec	Raw	mm3	347.306	347.306	0.000
Water, unspecified natural origin, IAI Area, Russia & RER w/o EU27 & EFTA	Raw	mm3	818.718	818.718	0.000
Water, unspecified natural origin, IAI Area, South America	Raw	mm3	327.758	327.758	0.000
Water, unspecified natural origin, IN	Raw	mm3	58.139	58.139	0.000
Water, unspecified natural origin, IT	Raw	cm3	1.953	1.953	0.000
Water, unspecified natural origin, JP	Raw	cm3	3.806	3.806	0.000
Water, unspecified natural origin, KR	Raw	mm3	593.315	593.315	0.000
Water, unspecified natural origin, LU	Raw	mm3	38.838	38.838	0.000
Water, unspecified natural origin, MX	Raw	mm3	9.343	9.343	0.000
Water, unspecified natural origin, NL	Raw	cm3	1.856	1.856	0.000
Water, unspecified natural origin, NO	Raw	mm3	100.003	100.003	0.000
Water, unspecified natural origin, PG	Raw	mm3	99.359	99.359	0.000
Water, unspecified natural origin, PH	Raw	mm3	9.321	9.321	0.000
Water, unspecified natural origin, PL	Raw	mm3	55.052	55.052	0.000
Water, unspecified natural origin, PT	Raw	mm3	221.807	221.807	0.000
Water, unspecified natural origin, RAF	Raw	cm3	51.353	51.353	0.000
Water, unspecified natural origin, RER	Raw	cu.in	89.319	89.319	0.000
Water, unspecified natural origin, RME	Raw	cm3	504.973	504.973	0.000
Water, unspecified natural origin, RNA	Raw	cm3	6.077	6.077	0.000
Water, unspecified natural origin, RoW	Raw	cu.in	525.019	525.019	0.000
Water, unspecified natural origin, RU	Raw	cm3	73.101	73.101	0.000
Water, unspecified natural origin, SE	Raw	cm3	1.254	1.254	0.000
Water, unspecified natural origin, SK	Raw	mm3	34.228	34.228	0.000
Water, unspecified natural origin, TH	Raw	mm3	10.065	10.065	0.000

Water, unspecified natural origin, TR	Raw	mm3	75.177	75.177	0.000
Water, unspecified natural origin, TW	Raw	cm3	1.211	1.211	0.000
Water, unspecified natural origin, UA	Raw	mm3	6.426	6.426	0.000
Water, unspecified natural origin, UN-OCEANIA	Raw	mm3	327.729	327.729	0.000
Water, unspecified natural origin, US	Raw	cu.in	613.134	537.104	76.030
Water, unspecified natural origin, WEU	Raw	mm3	1.161	1.161	0.000
Water, unspecified natural origin/m3	Raw	dm3	113.929	113.299	0.629
Water, well, in ground	Raw	cm3	274.055	250.092	23.963
Water, well, in ground, AT	Raw	mm3	2.261	2.261	0.000
Water, well, in ground, AU	Raw	cm3	139.028	139.028	0.000
Water, well, in ground, BE	Raw	mm3	4.724	4.724	0.000
Water, well, in ground, BG	Raw	mm3	8.272	8.272	0.000
Water, well, in ground, BR	Raw	cm3	36.227	36.227	0.000
Water, well, in ground, CA	Raw	cm3	23.254	23.254	0.000
Water, well, in ground, CH	Raw	cm3	38.314	38.314	0.000
Water, well, in ground, CN	Raw	cu.in	159.452	159.452	0.000
Water, well, in ground, CZ	Raw	mm3	0.307	0.307	0.000
Water, well, in ground, DE	Raw	cm3	20.917	20.917	0.000
Water, well, in ground, DK	Raw	mm3	3.778	3.778	0.000
Water, well, in ground, ES	Raw	cm3	1.167	1.167	0.000
Water, well, in ground, Europe without Switzerland	Raw	cm3	29.771	29.771	0.000
Water, well, in ground, FI	Raw	mm3	1.272	1.272	0.000
Water, well, in ground, FR	Raw	mm3	293.598	293.598	0.000
Water, well, in ground, GB	Raw	mm3	9.176	9.176	0.000
Water, well, in ground, GLO	Raw	cm3	26.126	26.126	0.000
Water, well, in ground, HU	Raw	mm3	1.293	1.293	0.000
Water, well, in ground, ID	Raw	cm3	241.464	241.464	0.000
Water, well, in ground, IN	Raw	cm3	41.288	41.288	0.000
Water, well, in ground, IT	Raw	mm3	9.826	9.826	0.000
Water, well, in ground, JP	Raw	mm3	16.304	16.304	0.000
Water, well, in ground, KR	Raw	mm3	1.242	1.242	0.000
Water, well, in ground, LU	Raw	mm3	0.205	0.205	0.000
Water, well, in ground, MA	Raw	mm3	64.514	64.514	0.000
Water, well, in ground, MY	Raw	mm3	115.165	115.165	0.000
Water, well, in ground, NL	Raw	mm3	9.273	9.273	0.000
Water, well, in ground, NO	Raw	mm3	0.501	0.501	0.000
Water, well, in ground, NORDEL	Raw	mm3	308.206	308.206	0.000
Water, well, in ground, PE	Raw	mm3	13.231	13.231	0.000
Water, well, in ground, PG	Raw	mm3	858.100	858.100	0.000
Water, well, in ground, PH	Raw	cm3	1.353	1.353	0.000
Water, well, in ground, PL	Raw	cm3	160.679	160.679	0.000
Water, well, in ground, PT	Raw	mm3	1.170	1.170	0.000
Water, well, in ground, RER	Raw	cm3	506.669	506.669	0.000
Water, well, in ground, RLA	Raw	cm3	28.428	28.428	0.000
Water, well, in ground, RNA	Raw	cm3	162.398	162.398	0.000
Water, well, in ground, RoW	Raw	cu.in	189.738	189.738	0.000
Water, well, in ground, RU	Raw	cm3	103.582	103.582	0.000
Water, well, in ground, SE	Raw	mm3	9.679	9.679	0.000
Water, well, in ground, SK	Raw	mm3	0.115	0.115	0.000
Water, well, in ground, TN	Raw	mm3	133.739	133.739	0.000
Water, well, in ground, TR	Raw	mm3	0.522	0.522	0.000
Water, well, in ground, TW	Raw	mm3	6.079	6.079	0.000
Water, well, in ground, US	Raw	cu.in	737.498	731.697	5.801
Water, well, in ground, WEU	Raw	cm3	100.453	100.453	0.000
Water, well, in ground, ZA	Raw	cm3	37.171	37.171	0.000
Occupation, annual crop	Raw	cm2a	11.535	11.520	0.015

Occupation, annual crop, greenhouse	Raw	m2s	23.174	23.174	0.000
Occupation, annual crop, irrigated	Raw	m2s	389.361	389.361	0.000
Occupation, annual crop, irrigated, intensive	Raw	m2s	796.044	796.044	0.000
Occupation, annual crop, non-irrigated	Raw	m2a	1.062	1.062	0.000
Occupation, annual crop, non-irrigated, extensive	Raw	mm2a	107.488	107.488	0.000
Occupation, annual crop, non-irrigated, intensive	Raw	cm2a	11.914	11.914	0.000
Occupation, arable land, unspecified use	Raw	m2s	0.000	0.000	0.000
Occupation, construction site	Raw	cm2a	34.876	21.140	13.736
Occupation, dump site	Raw	m2a	0.303	0.293	0.009
Occupation, dump site, benthos	Raw	m2s	100.859	27.441	73.418
Occupation, forest, extensive	Raw	mm2a	905.748	905.748	0.000
Occupation, forest, intensive	Raw	m2a	0.213	0.212	0.001
Occupation, forest, intensive, normal	Raw	m2a	14.814	14.813	0.001
Occupation, forest, intensive, short-cycle	Raw	m2a	0.676	0.676	0.000
Occupation, grassland, natural (non-use)	Raw	m2s	43.899	43.899	0.000
Occupation, industrial area	Raw	cm2a	208.203	207.230	0.973
Occupation, industrial area, benthos	Raw	m2s	0.922	0.251	0.671
Occupation, industrial area, built up	Raw	mm2a	297.406	284.620	12.786
Occupation, industrial area, vegetation	Raw	mm2a	63.404	58.820	4.585
Occupation, inland waterbody, unspecified	Raw	m2s	31.992	31.992	0.000
Occupation, mineral extraction site	Raw	cm2a	808.379	804.416	3.963
Occupation, pasture, man made, extensive	Raw	m2s	52.706	52.706	0.000
Occupation, pasture, man made, intensive	Raw	mm2a	121.107	121.107	0.000
Occupation, permanent crop	Raw	mm2a	43.170	43.170	0.000
Occupation, permanent crop, fruit, intensive	Raw	m2a	1.583	1.583	0.000
Occupation, permanent crop, irrigated	Raw	mm2a	270.360	270.360	0.000
Occupation, permanent crop, irrigated, intensive	Raw	m2s	266.571	266.571	0.000
Occupation, permanent crop, non-irrigated, intensive	Raw	m2s	34.484	34.484	0.000
Occupation, seabed, drilling and mining	Raw	m2s	0.169	0.169	0.000
Occupation, seabed, infrastructure	Raw	m2s	0.990	0.990	0.000
Occupation, shrub land, sclerophyllous	Raw	cm2a	18.772	5.172	13.599
Occupation, traffic area, rail network	Raw	m2s	337.167	137.043	200.125
Occupation, traffic area, rail/road embankment	Raw	cm2a	55.370	55.313	0.057
Occupation, traffic area, road embankment	Raw	m2a	0.146	0.146	0.000
Occupation, traffic area, road network	Raw	cm2a	174.576	174.308	0.268
Occupation, urban, discontinuously built	Raw	m2s	85.799	85.768	0.031
Occupation, urban/industrial fallow (non-use)	Raw	m2s	16.875	16.875	0.000
Occupation, water bodies, artificial	Raw	cm2a	610.162	607.988	2.174
Occupation, water courses, artificial	Raw	cm2a	209.663	208.288	1.375
Transformation, from annual crop	Raw	cm2	12.300	12.285	0.015
Transformation, from annual crop, greenhouse	Raw	mm2	1.694	1.694	0.000
Transformation, from annual crop, irrigated, intensive	Raw	mm2	28.641	28.641	0.000
Transformation, from annual crop, non-irrigated	Raw	m2	1.096	1.096	0.000
Transformation, from annual crop, non-irrigated, extensive	Raw	mm2	162.934	162.934	0.000
Transformation, from annual crop, non-irrigated, fallow	Raw	mm2	0.251	0.239	0.012
Transformation, from annual crop, non-irrigated, intensive	Raw	mm2	481.926	481.926	0.000
Transformation, from cropland fallow (non-use)	Raw	mm2	1.308	1.308	0.000
Transformation, from dump site, inert material landfill	Raw	mm2	0.344	0.287	0.057
Transformation, from dump site, residual material landfill	Raw	mm2	143.726	73.262	70.464
Transformation, from dump site, sanitary landfill	Raw	mm2	24.031	24.024	0.007
Transformation, from dump site, slag compartment	Raw	mm2	207.101	5.758	201.344
Transformation, from forest, extensive	Raw	sq.in	212.859	212.843	0.016
Transformation, from forest, intensive	Raw	cm2	26.420	26.420	0.000
Transformation, from forest, intensive, clear-cutting	Raw	cm2	241.300	241.300	0.000
Transformation, from forest, primary (non-use)	Raw	mm2	16.876	16.876	0.000
Transformation, from forest, secondary (non-use)	Raw	mm2	5.597	5.597	0.000

Transformation, from forest, unspecified	Raw	mm2	59.833	53.744	6.088
Transformation, from grassland, natural (non-use)	Raw	mm2	2.045	2.045	0.000
Transformation, from heterogeneous, agricultural	Raw	mm2	0.000	0.000	0.000
Transformation, from industrial area	Raw	mm2	55.417	55.138	0.279
Transformation, from industrial area, benthos	Raw	mm2	0.000	0.000	0.000
Transformation, from industrial area, built up	Raw	mm2	0.242	0.238	0.004
Transformation, from industrial area, vegetation	Raw	mm2	0.413	0.406	0.007
Transformation, from mineral extraction site	Raw	mm2	80.071	76.243	3.827
Transformation, from pasture, man made	Raw	mm2	612.552	339.447	273.105
Transformation, from pasture, man made, extensive	Raw	mm2	0.033	0.033	0.000
Transformation, from pasture, man made, intensive	Raw	mm2	132.835	132.834	0.001
Transformation, from permanent crop	Raw	mm2	3.262	3.262	0.000
Transformation, from permanent crop, irrigated	Raw	mm2	9.787	9.787	0.000
Transformation, from permanent crop, irrigated, intensive	Raw	mm2	7.388	7.388	0.000
Transformation, from permanent crop, non-irrigated, intensive	Raw	mm2	1.093	1.093	0.000
Transformation, from seabed, infrastructure	Raw	mm2	0.000	0.000	0.000
Transformation, from seabed, unspecified	Raw	mm2	3.402	1.072	2.329
Transformation, from shrub land, sclerophyllous	Raw	mm2	553.017	280.292	272.725
Transformation, from traffic area, rail/road embankment	Raw	mm2	14.717	14.717	0.000
Transformation, from traffic area, road network	Raw	mm2	0.006	0.006	0.000
Transformation, from tropical rain forest	Raw	cm2	241.300	241.300	0.000
Transformation, from unknown	Raw	cm2	39.578	39.405	0.173
Transformation, from unspecified, natural	Raw	mm2	0.001	0.001	0.000
Transformation, from wetland, inland (non-use)	Raw	mm2	0.123	0.123	0.000
Transformation, to annual crop	Raw	cm2	10.566	10.536	0.030
Transformation, to annual crop, fallow	Raw	mm2	1.815	1.815	0.000
Transformation, to annual crop, greenhouse	Raw	mm2	1.694	1.694	0.000
Transformation, to annual crop, irrigated, extensive	Raw	mm2	1.511	1.511	0.000
Transformation, to annual crop, irrigated, intensive	Raw	mm2	56.927	56.927	0.000
Transformation, to annual crop, non-irrigated	Raw	m2	1.095	1.095	0.000
Transformation, to annual crop, non-irrigated, extensive	Raw	mm2	174.713	174.713	0.000
Transformation, to annual crop, non-irrigated, fallow	Raw	mm2	0.589	0.270	0.319
Transformation, to annual crop, non-irrigated, intensive	Raw	cm2	15.330	15.330	0.000
Transformation, to dump site	Raw	cm2	23.369	23.280	0.089
Transformation, to dump site, benthos	Raw	mm2	3.197	0.870	2.327
Transformation, to dump site, inert material landfill	Raw	mm2	0.344	0.287	0.057
Transformation, to dump site, residual material landfill	Raw	mm2	143.727	73.263	70.464
Transformation, to dump site, sanitary landfill	Raw	mm2	24.031	24.024	0.007
Transformation, to dump site, slag compartment	Raw	mm2	207.101	5.758	201.344
Transformation, to forest, extensive	Raw	mm2	9.501	9.501	0.000
Transformation, to forest, intensive	Raw	cm2	27.743	27.690	0.053
Transformation, to forest, intensive, clear-cutting	Raw	cm2	241.300	241.300	0.000
Transformation, to forest, intensive, normal	Raw	sq.in	176.335	176.327	0.008
Transformation, to forest, intensive, short-cycle	Raw	cm2	241.300	241.300	0.000
Transformation, to forest, secondary (non-use)	Raw	mm2	0.007	0.007	0.000
Transformation, to forest, unspecified	Raw	mm2	395.567	121.430	274.137
Transformation, to grassland, natural (non-use)	Raw	mm2	0.105	0.105	0.000
Transformation, to heterogeneous, agricultural	Raw	mm2	0.333	0.132	0.200
Transformation, to industrial area	Raw	mm2	239.565	238.540	1.025
Transformation, to industrial area, benthos	Raw	mm2	0.003	0.001	0.002
Transformation, to industrial area, built up	Raw	mm2	6.458	6.152	0.306
Transformation, to industrial area, vegetation	Raw	mm2	0.932	0.831	0.101
Transformation, to inland waterbody, unspecified	Raw	mm2	0.010	0.010	0.000
Transformation, to mineral extraction site	Raw	cm2	11.020	10.910	0.111
Transformation, to pasture, man made	Raw	mm2	16.554	16.480	0.073
Transformation, to pasture, man made, extensive	Raw	mm2	0.033	0.033	0.000

Transformation, to pasture, man made, intensive	Raw	mm2	109.720	109.720	0.000
Transformation, to permanent crop	Raw	mm2	25.872	25.872	0.000
Transformation, to permanent crop, fruit, intensive	Raw	cm2	222.907	222.907	0.000
Transformation, to permanent crop, irrigated	Raw	mm2	9.787	9.787	0.000
Transformation, to permanent crop, irrigated, intensive	Raw	mm2	7.388	7.388	0.000
Transformation, to permanent crop, non-irrigated	Raw	mm2	0.007	0.007	0.000
Transformation, to permanent crop, non-irrigated, intensive	Raw	mm2	1.093	1.093	0.000
Transformation, to sea and ocean	Raw	mm2	0.000	0.000	0.000
Transformation, to seabed, drilling and mining	Raw	mm2	0.005	0.005	0.000
Transformation, to seabed, infrastructure	Raw	mm2	0.196	0.196	0.000
Transformation, to seabed, unspecified	Raw	mm2	0.000	0.000	0.000
Transformation, to shrub land, sclerophyllous	Raw	mm2	375.202	103.330	271.872
Transformation, to traffic area, rail network	Raw	mm2	0.025	0.010	0.015
Transformation, to traffic area, rail/road embankment	Raw	mm2	29.840	29.827	0.013
Transformation, to traffic area, road embankment	Raw	cm2	11.243	11.241	0.001
Transformation, to traffic area, road network	Raw	mm2	21.136	20.837	0.299
Transformation, to unknown	Raw	mm2	71.993	70.316	1.676
Transformation, to urban, discontinuously built	Raw	mm2	0.056	0.056	0.000
Transformation, to urban/industrial fallow	Raw	mm2	0.007	0.007	0.000
Transformation, to water bodies, artificial	Raw	mm2	466.081	464.472	1.609
Transformation, to water courses, artificial	Raw	mm2	259.510	257.812	1.698
Transformation, to wetland, inland (non-use)	Raw	mm2	0.022	0.022	0.000
2-Chloroacetophenone	Air	ng	29.616	29.071	0.545
2-Propanol	Air	ng	143.437	143.437	0.000
5-methyl Chrysene	Air	ng	191.522	187.976	3.546
Acenaphthene	Air	µg	5.038	4.952	0.086
Acenaphthylene	Air	µg	2.189	2.149	0.040
Acetaldehyde	Air	g	1.429	1.424	0.006
Acetic acid	Air	mg	67.709	67.274	0.435
Acetone	Air	µg	25.391	25.391	0.000
Acetophenone	Air	ng	63.463	62.295	1.168
Acrolein	Air	g	3.259	3.259	0.000
Aldehydes, unspecified	Air	g	1.237	1.010	0.227
Aluminium	Air	g	3.975	3.958	0.016
Ammonia	Air	g	9.637	9.040	0.597
Ammonium chloride	Air	mg	25.924	25.452	0.472
Anthracene	Air	µg	1.828	1.794	0.034
Antimony	Air	mg	15.819	15.816	0.003
Argon-40	Air	g	6.430	6.430	0.000
Arsenic	Air	mg	22.325	22.231	0.094
Barium	Air	mg	3.583	3.583	0.000
Benzal chloride	Air	ng	14.383	12.627	1.756
Benzaldehyde	Air	µg	690.294	690.294	0.000
Benzene	Air	g	13.895	13.840	0.055
Benzene, chloro-	Air	ng	93.079	91.366	1.713
Benzene, ethyl-	Air	µg	12.483	12.475	0.008
Benzene, hexachloro-	Air	µg	52.934	52.932	0.002
Benzo(a)anthracene	Air	ng	696.679	683.784	12.895
Benzo(a)pyrene	Air	µg	42.366	42.062	0.303
Benzo(b)fluoranthene	Air	pg	285.702	285.702	0.000
Benzo(b,j,k)fluoranthene	Air	ng	957.611	939.881	17.730
Benzo(g,h,i)perylene	Air	ng	235.070	230.718	4.352
Benzo(k)fluoranthene	Air	pg	206.613	206.613	0.000
Benzyl chloride	Air	µg	2.962	2.907	0.055
Beryllium	Air	mg	1.451	1.446	0.005
Biphenyl	Air	µg	14.800	14.526	0.274

Boron	Air	µg	26.030	26.030	0.000
Bromine	Air	µg	26.681	26.680	0.000
Bromoform	Air	ng	165.003	161.966	3.036
BTEX (Benzene, Toluene, Ethylbenzene, and Xylene), unspecified ratio	Air	mg	835.236	754.979	80.257
Butadiene	Air	mg	2.186	2.183	0.003
Butane	Air	mg	167.700	166.301	1.398
Cadmium	Air	mg	4.735	4.710	0.025
Calcium	Air	µg	877.666	877.666	0.000
Carbon dioxide, biogenic	Air	kg	159.798	159.780	0.018
Carbon dioxide, fossil	Air	kg	198.101	179.663	18.438
Carbon dioxide, land transformation	Air	mg	29.498	29.498	0.000
Carbon disulfide	Air	ng	552.677	542.230	10.447
Carbon monoxide	Air	g	494.894	494.890	0.003
Carbon monoxide, biogenic	Air	µg	80.288	80.288	0.000
Carbon monoxide, fossil	Air	kg	1.150	1.014	0.136
Carbonyl sulfide	Air	µg	462.459	462.459	0.000
Chloride	Air	ng	678.490	667.482	11.008
Chlorine	Air	mg	642.500	642.498	0.002
Chloroform	Air	ng	250.834	246.092	4.742
Chlorosulfonic acid	Air	ng	1.680	1.680	0.000
Chromium	Air	mg	26.205	26.133	0.072
Chromium VI	Air	µg	692.364	679.152	13.212
Chrysene	Air	ng	870.592	854.474	16.119
Cobalt	Air	mg	7.718	7.603	0.116
Copper	Air	mg	120.589	120.342	0.247
Cumene	Air	ng	22.532	22.106	0.426
Cyanide	Air	µg	10.628	10.428	0.201
Dibenz(a,h)anthracene	Air	pg	134.268	134.268	0.000
Dinitrogen monoxide	Air	g	4.246	4.156	0.090
Dioxin, 2,3,7,8 Tetrachlorodibenzo-p-	Air	mg	1.354	1.354	0.000
Ethane	Air	mg	260.308	258.239	2.069
Ethane, 1,1,1-trichloro-, HCFC-140	Air	µg	2.922	2.398	0.524
Ethane, 1,1,1,2-tetrafluoro-, HFC-134a	Air	mg	4.591	3.955	0.636
Ethane, 1,1,2-trichloro-1,2,2-trifluoro-, CFC-113	Air	ng	577.924	577.924	0.000
Ethane, 1,2-dibromo-	Air	ng	5.077	4.984	0.093
Ethane, 1,2-dichloro-	Air	ng	169.605	166.491	3.114
Ethane, 2-chloro-1,1,1,2-tetrafluoro-, HCFC-124	Air	ng	577.924	577.924	0.000
Ethane, chloro-	Air	ng	177.695	174.425	3.270
Ethane, hexafluoro-, HFC-116	Air	µg	37.442	35.639	1.803
Ethanol	Air	ng	65.702	65.702	0.000
Ethene	Air	µg	7.061	7.061	0.000
Ethene, chloro-	Air	pg	822.515	722.111	100.404
Ethene, tetrachloro-	Air	µg	462.281	453.896	8.386
Ethylene oxide	Air	µg	1.041	1.040	0.001
Ethyne	Air	µg	23.012	22.967	0.045
Fluoranthene	Air	µg	6.183	6.069	0.114
Fluorene	Air	µg	7.924	7.777	0.147
Fluoride	Air	µg	772.016	758.016	14.000
Fluorine	Air	ng	564.917	560.567	4.350
Formaldehyde	Air	g	5.263	5.252	0.011
Furan	Air	ng	41.196	40.438	0.758
Heat, waste	Air	MJ	198.750	193.225	5.525
Helium	Air	µg	9.085	9.084	0.000
Heptane	Air	µg	151.160	151.160	0.000
Hexane	Air	mg	143.546	142.349	1.198
Hydrazine, methyl-	Air	ng	719.243	706.007	13.236

Hydrocarbons, aliphatic, alkanes, unspecified	Air	mg	584.200	584.175	0.024
Hydrocarbons, aliphatic, unsaturated	Air	µg	12.310	12.310	0.000
Hydrocarbons, aromatic	Air	mg	227.743	227.736	0.007
Hydrocarbons, chlorinated	Air	µg	62.379	62.203	0.176
Hydrocarbons, unspecified	Air	g	30.779	17.080	13.699
Hydrogen	Air	mg	2.924	2.909	0.015
Hydrogen chloride	Air	g	26.879	26.667	0.213
Hydrogen fluoride	Air	g	1.353	1.328	0.025
Hydrogen sulfide	Air	mg	542.347	492.913	49.433
Indeno(1,2,3-cd)pyrene	Air	ng	531.108	521.276	9.833
Iodine	Air	µg	9.796	9.796	0.000
Iron	Air	mg	19.845	19.844	0.001
Isophorone	Air	µg	2.454	2.409	0.045
Isoprene	Air	g	22.239	21.878	0.361
Kerosene	Air	mg	12.416	12.190	0.226
Lead	Air	mg	67.181	67.056	0.125
Lead-210	Air	mBq	4.083	4.083	0.000
m-Xylene	Air	µg	493.938	493.938	0.000
Magnesium	Air	mg	96.186	94.362	1.825
Manganese	Air	g	1.309	1.309	0.000
Mercaptans, unspecified	Air	µg	881.593	865.741	15.852
Mercury	Air	mg	10.164	10.140	0.024
Metals, unspecified	Air	g	34.760	34.760	0.000
Methane	Air	g	220.399	196.253	24.147
Methane, biogenic	Air	mg	8.776	8.520	0.256
Methane, bromo-, Halon 1001	Air	ng	680.225	667.366	12.859
Methane, chlorodifluoro-, HCFC-22	Air	pg	19.731	19.731	0.000
Methane, dichloro-, HCC-30	Air	mg	243.285	243.155	0.130
Methane, dichlorodifluoro-, CFC-12	Air	µg	3.509	2.863	0.647
Methane, fossil	Air	g	144.783	130.141	14.642
Methane, monochloro-, R-40	Air	µg	2.242	2.201	0.041
Methane, tetrachloro-, CFC-10	Air	mg	36.567	36.567	0.000
Methane, tetrafluoro-, CFC-14	Air	µg	371.563	355.333	16.230
Methanol	Air	mg	23.086	22.960	0.127
Methyl ethyl ketone	Air	µg	13.825	11.693	2.132
Methyl methacrylate	Air	ng	84.617	83.060	1.557
Molybdenum	Air	µg	924.737	924.737	0.000
Naphtalene	Air	ng	271.015	271.015	0.000
Naphthalene	Air	mg	79.257	79.234	0.023
Nickel	Air	mg	55.564	54.123	1.441
Nitrate	Air	µg	407.136	407.136	0.000
Nitrogen dioxide	Air	g	17.027	9.004	8.023
Nitrogen monoxide	Air	g	191.735	101.351	90.384
Nitrogen oxides	Air	kg	1.310	1.183	0.127
Nitrogen, atmospheric	Air	g	1.689	1.514	0.175
NMVOC, non-methane volatile organic compounds, unspecified origin	Air	g	912.568	808.858	103.710
o-Xylene	Air	µg	201.546	201.546	0.000
Organic acids	Air	kg	43.800	43.800	0.000
Organic substances, unspecified	Air	mg	53.980	52.981	0.999
Ozone	Air	mg	17.042	16.967	0.075
PAH, polycyclic aromatic hydrocarbons	Air	mg	14.047	14.003	0.044
Particulates, < 10 um	Air	g	13.848	7.380	6.468
Particulates, < 2.5 um	Air	g	18.182	12.254	5.928
Particulates, > 10 um	Air	g	3.921	3.876	0.045
Particulates, > 2.5 um, and < 10um	Air	g	428.386	427.765	0.621
Particulates, unspecified	Air	g	36.265	34.436	1.829

Pentane	Air	mg	208.208	206.471	1.737
Phenanthrene	Air	µg	23.536	23.101	0.435
Phenol	Air	µg	9.562	8.595	0.967
Phenol, 2,4-dichloro-	Air	ng	13.628	13.628	0.000
Phenol, pentachloro-	Air	ng	45.302	45.302	0.000
Phenols, unspecified	Air	mg	45.432	45.367	0.065
Phosphorus	Air	ng	768.057	767.062	0.995
Phthalate, dioctyl-	Air	ng	308.852	303.168	5.684
Polonium-210	Air	mBq	7.461	7.460	0.000
Polychlorinated biphenyls	Air	µg	80.753	80.750	0.003
Potassium	Air	µg	150.077	150.077	0.000
Potassium-40	Air	mBq	1.005	1.005	0.000
Propanal	Air	µg	1.616	1.585	0.031
Propane	Air	mg	127.671	126.606	1.065
Propene	Air	mg	144.397	144.204	0.194
Propionic acid	Air	mg	2.896	2.872	0.024
Propylene oxide	Air	µg	10.918	10.918	0.000
Pyrene	Air	µg	2.874	2.821	0.053
Radioactive species, unspecified	Air	kBq	493.358	484.227	9.131
Radionuclides (Including Radon)	Air	mg	694.291	681.648	12.643
Radium-226	Air	mBq	1.054	1.054	0.000
Radium-228	Air	µBq	322.362	322.356	0.005
Radon-220	Air	mBq	21.806	21.805	0.000
Radon-222	Air	mBq	12.292	12.292	0.000
Scandium	Air	pg	326.875	326.875	0.000
Selenium	Air	mg	15.795	15.564	0.231
Silicon	Air	mg	6.612	6.612	0.000
Silver	Air	ng	34.410	34.410	0.000
Sodium	Air	µg	831.784	831.784	0.000
Strontium	Air	µg	54.284	54.284	0.000
Styrene	Air	µg	282.385	282.383	0.002
Sulfate	Air	mg	3.534	3.534	0.000
Sulfur dioxide	Air	g	340.287	328.149	12.138
Sulfur hexafluoride	Air	µg	499.509	496.019	3.490
Sulfur monoxide	Air	g	97.718	82.282	15.437
Sulfur oxides	Air	g	23.695	23.695	0.000
Sulfur trioxide	Air	ng	63.165	63.165	0.000
Sulfuric acid	Air	ng	928.157	928.157	0.000
Sulfuric acid, dimethyl ester	Air	ng	203.080	199.343	3.737
t-Butyl methyl ether	Air	ng	148.080	145.354	2.725
Tar	Air	ng	763.115	750.734	12.381
Thallium	Air	µg	3.131	0.713	2.419
Thorium	Air	pg	945.963	945.963	0.000
Thorium-228	Air	µBq	169.731	169.728	0.003
Thorium-232	Air	µBq	264.394	264.390	0.005
Tin	Air	µg	665.698	663.960	1.738
Titanium	Air	µg	445.930	445.928	0.002
TOC, Total Organic Carbon	Air	g	3.323	3.323	0.000
Toluene	Air	g	5.809	5.723	0.086
Toluene, 2,4-dinitro-	Air	ng	1.185	1.163	0.022
Uranium	Air	ng	1.481	1.481	0.000
Uranium-238	Air	µBq	878.148	878.133	0.015
Vanadium	Air	µg	192.518	191.581	0.937
Vinyl acetate	Air	ng	32.154	31.563	0.592
VOC, volatile organic compounds	Air	g	745.526	730.345	15.181
Water	Air	g	4.283	4.246	0.037

Water/m3	Air	dm3	63.306	63.306	0.000
Xylene	Air	g	7.395	7.345	0.050
Zinc	Air	mg	114.960	114.758	0.202
1-Butanol	Air	µg	1.289	1.289	0.000
1-Pentanol	Air	mg	3.607	3.607	0.000
1-Pentene	Air	mg	2.726	2.726	0.000
1-Propanol	Air	mg	26.668	26.668	0.000
1,4-Butanediol	Air	µg	10.635	10.635	0.000
2-Aminopropanol	Air	ng	367.453	367.395	0.058
2-Butene, 2-methyl-	Air	ng	605.586	605.586	0.000
2-Methyl-1-propanol	Air	mg	6.208	6.208	0.000
2-Nitrobenzoic acid	Air	ng	582.326	582.192	0.135
2-Propanol	Air	µg	277.710	274.636	3.073
Acenaphthene	Air	ng	1.588	1.562	0.026
Acetaldehyde	Air	mg	86.990	86.597	0.394
Acetic acid	Air	mg	34.683	29.440	5.243
Acetone	Air	mg	53.183	52.812	0.371
Acrolein	Air	mg	10.749	10.749	0.000
Acrylic acid	Air	ng	41.186	33.235	7.951
Aldehydes, unspecified	Air	µg	301.546	298.780	2.766
Aluminium	Air	mg	102.228	98.784	3.443
Ammonia	Air	g	4.877	1.887	2.990
Ammonium carbonate	Air	µg	19.672	19.657	0.015
Aniline	Air	µg	18.168	18.166	0.003
Anthranilic acid	Air	ng	417.348	417.244	0.105
Antimony	Air	µg	22.603	22.570	0.034
Arsenic	Air	mg	2.153	2.119	0.033
Arsine	Air	pg	0.480	0.387	0.093
Barium	Air	mg	1.257	1.254	0.002
Benzaldehyde	Air	mg	5.608	5.608	0.000
Benzene	Air	g	1.663	1.503	0.161
Benzene, 1-methyl-2-nitro-	Air	ng	502.870	502.754	0.116
Benzene, 1,2-dichloro-	Air	mg	5.986	5.986	0.000
Benzene, ethyl-	Air	mg	250.335	250.122	0.213
Benzene, hexachloro-	Air	µg	347.348	6.688	340.660
Benzene, pentachloro-	Air	µg	871.942	16.772	855.170
Benzo(a)pyrene	Air	µg	477.885	474.111	3.774
Beryllium	Air	µg	11.838	11.811	0.026
Boric acid	Air	pg	17.883	17.883	0.000
Boron	Air	mg	89.543	6.848	82.695
Boron trifluoride	Air	ng	119.828	119.828	0.000
Bromine	Air	mg	57.338	57.337	0.001
Butadiene	Air	mg	2.325	2.325	0.000
Butane	Air	g	3.616	3.590	0.027
Butene	Air	mg	176.166	175.953	0.213
Butyrolactone	Air	µg	3.514	3.514	0.000
Cadmium	Air	mg	2.919	2.832	0.087
Calcium	Air	g	5.636	5.565	0.072
Carbon	Air	µg	7.546	7.546	0.000
Carbon dioxide, biogenic	Air	kg	580.590	103.435	477.156
Carbon dioxide, fossil	Air	kg	85.005	83.464	1.541
Carbon disulfide	Air	mg	9.661	9.661	0.000
Carbon monoxide, biogenic	Air	g	120.693	46.985	73.708
Carbon monoxide, fossil	Air	g	14.125	13.240	0.885
Chloramine	Air	mg	12.643	12.643	0.000
Chlorine	Air	mg	322.370	319.982	2.388

Chloroacetic acid	Air	µg	37.807	37.805	0.001
Chloroform	Air	µg	40.403	40.303	0.099
Chlorosilane, trimethyl-	Air	ng	11.270	10.092	1.178
Chlorosulfonic acid	Air	ng	301.735	301.669	0.066
Chromium	Air	mg	5.220	5.178	0.041
Chromium IV	Air	pg	13.048	13.048	0.000
Chromium VI	Air	µg	76.447	75.979	0.467
Cobalt	Air	mg	2.401	2.317	0.084
Copper	Air	mg	26.133	25.970	0.163
Cumene	Air	mg	18.814	18.730	0.084
Cyanide	Air	mg	307.292	17.075	290.217
Cyanoacetic acid	Air	ng	247.104	247.050	0.054
Cyclohexane	Air	ng	468.604	468.604	0.000
Diethyl ether	Air	ng	1.647	1.647	0.000
Diethylamine	Air	µg	8.291	8.290	0.001
Diethylene glycol	Air	ng	1.265	1.265	0.000
Dimethyl malonate	Air	ng	309.873	309.805	0.068
Dimethylamine	Air	ng	6.186	6.186	0.000
Dinitrogen monoxide	Air	g	4.773	3.401	1.372
Dioxin, 2,3,7,8 Tetrachlorodibenzo-p-	Air	µg	2.739	0.082	2.657
Dipropylamine	Air	µg	5.078	5.078	0.001
Ethane	Air	mg	869.282	867.014	2.268
Ethane, 1,1-difluoro-, HFC-152a	Air	µg	38.670	38.664	0.006
Ethane, 1,1,1,2-tetrafluoro-, HFC-134a	Air	µg	3.600	3.599	0.001
Ethane, 1,1,2-trichloro-1,2,2-trifluoro-, CFC-113	Air	ng	1.955	1.577	0.377
Ethane, 1,2-dichloro-	Air	mg	5.734	5.726	0.007
Ethane, hexafluoro-, HFC-116	Air	ng	141.226	115.072	26.153
Ethanol	Air	mg	46.584	45.849	0.735
Ethene	Air	mg	699.725	699.181	0.544
Ethene, chloro-	Air	µg	184.271	182.113	2.158
Ethene, tetrachloro-	Air	ng	798.532	798.526	0.006
Ethyl acetate	Air	mg	2.130	2.116	0.014
Ethyl cellulose	Air	µg	2.307	2.278	0.029
Ethylamine	Air	mg	3.178	3.178	0.000
Ethylene diamine	Air	mg	2.951	2.951	0.000
Ethylene oxide	Air	mg	36.790	36.788	0.002
Ethyne	Air	mg	13.973	13.963	0.010
Fluorine	Air	mg	47.352	47.352	0.000
Fluosilicic acid	Air	µg	70.809	68.701	2.108
Formaldehyde	Air	mg	146.007	142.378	3.629
Formamide	Air	mg	6.597	6.597	0.000
Formic acid	Air	mg	1.917	1.917	0.000
Heat, waste	Air	MWh	3.088	0.637	2.451
Heptane	Air	mg	809.686	807.471	2.214
Hexane	Air	g	3.406	3.401	0.005
Hydrocarbons, aliphatic, alkanes, cyclic	Air	mg	20.334	19.871	0.463
Hydrocarbons, aliphatic, alkanes, unspecified	Air	g	4.911	4.909	0.002
Hydrocarbons, aliphatic, unsaturated	Air	g	3.631	3.631	0.000
Hydrocarbons, aromatic	Air	mg	724.936	724.563	0.374
Hydrocarbons, chlorinated	Air	mg	18.518	18.516	0.002
Hydrogen	Air	mg	238.160	203.404	34.756
Hydrogen chloride	Air	mg	607.294	601.594	5.700
Hydrogen fluoride	Air	mg	36.904	32.886	4.018
Hydrogen peroxide	Air	µg	2.290	2.268	0.021
Hydrogen sulfide	Air	µg	200.169	159.332	40.837
Iodine	Air	µg	317.799	317.531	0.268

Iron	Air	mg	54.101	53.393	0.708
Isocyanic acid	Air	µg	585.912	585.791	0.122
Isopropylamine	Air	ng	587.275	587.169	0.105
Lactic acid	Air	µg	3.978	3.978	0.001
Lead	Air	mg	29.715	29.230	0.485
Lead-210	Air	mBq	516.777	515.868	0.909
Lithium	Air	ng	1.289	1.289	0.000
m-Xylene	Air	mg	118.948	118.947	0.001
Magnesium	Air	mg	466.762	377.790	88.972
Manganese	Air	mg	161.293	161.290	0.003
Mercury	Air	mg	1.149	1.075	0.075
Methane	Air	µg	22.301	22.301	0.000
Methane, biogenic	Air	g	2.594	0.485	2.109
Methane, bromo-, Halon 1001	Air	ng	25.470	25.470	0.000
Methane, bromotrifluoro-, Halon 1301	Air	ng	1.630	1.630	0.000
Methane, chlorodifluoro-, HCFC-22	Air	µg	46.925	46.912	0.013
Methane, dichloro-, HCC-30	Air	mg	10.759	10.759	0.000
Methane, dichlorodifluoro-, CFC-12	Air	µg	364.694	364.609	0.085
Methane, dichlorofluoro-, HCFC-21	Air	ng	9.757	9.754	0.003
Methane, fossil	Air	g	12.033	11.947	0.085
Methane, monochloro-, R-40	Air	pg	36.355	14.105	22.249
Methane, tetrachloro-, CFC-10	Air	µg	222.136	216.381	5.756
Methane, tetrafluoro-, CFC-14	Air	ng	13.600	13.291	0.309
Methane, trichlorofluoro-, CFC-11	Air	ng	15.623	15.619	0.004
Methane, trifluoro-, HFC-23	Air	µg	3.104	3.104	0.001
Methanesulfonic acid	Air	ng	249.706	249.652	0.055
Methanol	Air	mg	38.700	26.348	12.352
Methyl acetate	Air	ng	134.845	134.813	0.031
Methyl acrylate	Air	ng	46.730	37.709	9.021
Methyl borate	Air	mg	1.336	1.336	0.000
Methyl ethyl ketone	Air	mg	2.106	2.092	0.014
Methyl formate	Air	mg	1.744	1.744	0.000
Methyl lactate	Air	µg	4.367	4.367	0.001
Methylamine	Air	µg	8.958	8.958	0.000
Molybdenum	Air	mg	1.734	1.151	0.583
Monoethanolamine	Air	µg	200.862	200.266	0.597
Nickel	Air	mg	33.425	31.817	1.608
Nitrate	Air	µg	122.004	121.264	0.740
Nitrobenzene	Air	µg	24.955	24.951	0.003
Nitrogen fluoride	Air	pg	349.976	349.976	0.000
Nitrogen oxides	Air	g	272.530	149.563	122.967
NMVOC, non-methane volatile organic compounds, unspecified origin	Air	g	25.940	3.904	22.036
o-Xylene	Air	ng	759.795	759.795	0.000
Organic carbon	Air	µg	18.767	18.767	0.000
Ozone	Air	µg	54.204	53.556	0.648
PAH, polycyclic aromatic hydrocarbons	Air	mg	11.317	11.067	0.250
Paraffins	Air	µg	8.151	8.151	0.000
Particulates, < 2.5 um	Air	g	49.695	47.502	2.193
Particulates, > 10 um	Air	g	1.711	1.684	0.027
Particulates, > 2.5 um, and < 10um	Air	mg	925.692	882.171	43.522
Pentane	Air	g	4.486	4.445	0.041
Pentane, 3-methyl-	Air	µg	6.582	6.582	0.000
Phenol	Air	mg	10.827	10.823	0.004
Phenol, 2,4-dichloro-	Air	µg	3.680	3.680	0.000
Phenol, pentachloro-	Air	µg	103.116	9.505	93.611
Phosphine	Air	ng	817.169	817.162	0.007

Phosphoric acid	Air	pg	633.076	633.076	0.000
Phosphorus	Air	mg	322.131	286.504	35.627
Phosphorus trichloride	Air	µg	4.314	4.314	0.000
Platinum	Air	pg	12.821	12.725	0.096
Polonium-210	Air	mBq	945.242	943.580	1.661
Polychlorinated biphenyls	Air	ng	48.644	48.643	0.000
Potassium	Air	g	22.236	22.172	0.065
Potassium-40	Air	mBq	146.222	145.959	0.263
Propanal	Air	mg	22.544	22.544	0.000
Propane	Air	g	3.450	3.436	0.014
Propene	Air	mg	197.632	197.162	0.469
Propionic acid	Air	µg	728.784	231.420	497.364
Propylamine	Air	mg	2.089	2.089	0.000
Propylene oxide	Air	mg	5.723	5.722	0.000
Radioactive species, other beta emitters	Air	Bq	54.983	54.981	0.002
Radium-226	Air	mBq	133.489	133.254	0.235
Radium-228	Air	mBq	605.878	604.635	1.243
Radon-220	Air	mBq	482.673	482.543	0.130
Radon-222	Air	mBq	275.810	275.729	0.081
Scandium	Air	µg	11.614	11.590	0.024
Selenium	Air	mg	1.038	1.007	0.031
Silicon	Air	mg	147.084	146.761	0.323
Silicon tetrachloride	Air	µg	10.798	10.798	0.000
Silver	Air	ng	44.886	43.884	1.001
Sodium	Air	g	1.336	1.291	0.045
Sodium chlorate	Air	µg	28.816	27.792	1.024
Sodium dichromate	Air	µg	34.453	9.039	25.414
Sodium formate	Air	µg	1.528	1.340	0.187
Sodium hydroxide	Air	µg	9.634	9.555	0.080
Sodium tetrahydroborate	Air	ng	232.349	232.349	0.000
Strontium	Air	mg	1.831	1.827	0.004
Styrene	Air	µg	13.901	13.732	0.169
Sulfate	Air	mg	300.303	271.496	28.807
Sulfur dioxide	Air	g	107.750	106.967	0.784
Sulfur hexafluoride	Air	ng	1.400	1.400	0.000
Sulfur trioxide	Air	µg	194.068	194.041	0.027
Sulfuric acid	Air	µg	1.657	1.640	0.017
t-Butyl methyl ether	Air	mg	336.132	336.131	0.000
t-Butylamine	Air	ng	577.925	577.820	0.104
Tetramethyl ammonium hydroxide	Air	µg	8.393	8.393	0.000
Thallium	Air	µg	14.571	14.540	0.031
Thorium	Air	µg	17.503	17.466	0.036
Thorium-228	Air	mBq	54.342	54.236	0.106
Thorium-232	Air	mBq	37.988	37.920	0.068
Tin	Air	µg	14.637	14.615	0.022
Titanium	Air	mg	3.511	3.504	0.007
Toluene	Air	g	1.466	1.160	0.306
Toluene, 2-chloro-	Air	µg	8.081	8.080	0.001
Trimethylamine	Air	ng	227.880	227.815	0.065
Uranium	Air	µg	23.304	23.256	0.048
Uranium-238	Air	mBq	111.192	110.997	0.195
Vanadium	Air	mg	68.468	62.137	6.331
Water	Air	ng	139.851	46.863	92.989
Water/m3	Air	cm3	77.195	77.195	0.000
Xylene	Air	g	1.064	1.063	0.001
Zinc	Air	mg	289.134	288.906	0.228

1-Propanol	Air	pg	1.306	1.306	0.000
2-Methyl-4-chlorophenoxyacetic acid	Air	ng	1.126	1.126	0.000
2-Propanol	Air	ng	20.702	20.702	0.000
2,4-D	Air	ng	176.262	176.262	0.000
2,4-D amines	Air	pg	557.364	557.364	0.000
2,4-D ester	Air	ng	6.507	6.507	0.000
4-Methyl-2-pentanone	Air	pg	452.435	452.435	0.000
Acenaphthene	Air	µg	3.973	3.956	0.017
Acephate	Air	ng	18.736	18.736	0.000
Acetaldehyde	Air	mg	95.751	95.751	0.000
Acetamide	Air	ng	4.612	4.612	0.000
Acetic acid	Air	mg	629.490	629.489	0.001
Acetone	Air	mg	130.551	130.548	0.004
Acetonitrile	Air	mg	26.254	26.254	0.000
Acifluorfen	Air	ng	2.572	2.572	0.000
Acrolein	Air	mg	2.292	2.282	0.010
Actinides, radioactive, unspecified	Air	Bq	16.085	16.015	0.069
Aerosols, radioactive, unspecified	Air	mBq	645.217	641.701	3.516
Alachlor	Air	ng	18.201	18.201	0.000
Aldehydes, unspecified	Air	mg	7.760	7.726	0.034
Aluminium	Air	µg	964.465	878.616	85.849
Ammonia	Air	g	1.558	1.557	0.001
Antimony	Air	µg	203.209	202.251	0.957
Antimony-124	Air	nBq	377.076	376.500	0.575
Antimony-125	Air	µBq	6.158	6.152	0.006
Argon-41	Air	mBq	777.315	751.711	25.604
Arsenic	Air	mg	5.926	5.908	0.017
Atrazine	Air	ng	19.647	19.647	0.000
Azoxystrobin	Air	ng	8.511	8.511	0.000
Barium	Air	µg	849.543	848.437	1.106
Barium-140	Air	µBq	217.145	216.755	0.390
Bentazone	Air	ng	8.012	8.012	0.000
Benzaldehyde	Air	µg	9.927	9.927	0.000
Benzene	Air	mg	829.671	829.469	0.202
Benzene, ethyl-	Air	µg	733.791	730.635	3.157
Benzene, hexachloro-	Air	pg	0.000	0.000	0.000
Benzo(a)pyrene	Air	mg	5.371	5.371	0.001
Beryllium	Air	µg	173.604	172.896	0.708
Boron	Air	mg	22.541	22.439	0.102
Bromine	Air	mg	4.358	4.349	0.009
Bromoxynil	Air	pg	634.152	634.152	0.000
Butadiene	Air	ng	7.637	7.631	0.006
Butane	Air	mg	89.349	88.151	1.198
Butyric acid, 4-(2,4-dichlorophenoxy)-	Air	ng	3.878	3.878	0.000
Cadmium	Air	µg	466.053	463.592	2.461
Calcium	Air	µg	701.300	640.966	60.334
Carbaryl	Air	ng	2.395	2.395	0.000
Carbon-14	Air	Bq	35.330	35.052	0.278
Carbon dioxide, biogenic	Air	g	43.191	43.139	0.052
Carbon dioxide, fossil	Air	kg	49.831	49.617	0.213
Carbon dioxide, land transformation	Air	g	381.289	381.283	0.006
Carbon disulfide	Air	mg	462.859	462.341	0.518
Carbon monoxide, biogenic	Air	mg	29.940	29.816	0.124
Carbon monoxide, fossil	Air	g	52.410	52.244	0.166
Carbon monoxide, land transformation	Air	mg	11.652	11.652	0.000
Carfentrazone-ethyl	Air	pg	236.096	236.096	0.000

Cerium-141	Air	µBq	52.632	52.537	0.095
Cesium-134	Air	µBq	2.521	2.516	0.005
Cesium-137	Air	µBq	45.562	45.481	0.080
Chlorimuron-ethyl	Air	ng	4.296	4.296	0.000
Chlorinated solvents, unspecified	Air	µg	1.785	1.785	0.000
Chlorine	Air	µg	110.026	109.415	0.611
Chloroform	Air	µg	761.883	758.593	3.290
Chlorpyrifos	Air	ng	85.694	85.694	0.000
Chromium	Air	mg	370.963	370.839	0.124
Chromium-51	Air	µBq	3.373	3.367	0.006
Chromium VI	Air	mg	9.835	9.830	0.006
Clethodim	Air	ng	12.709	12.709	0.000
Cloransulam-methyl	Air	ng	2.237	2.237	0.000
Cobalt	Air	mg	5.917	5.849	0.068
Cobalt-58	Air	µBq	6.673	6.665	0.008
Cobalt-60	Air	µBq	50.614	50.539	0.075
Copper	Air	mg	17.349	17.319	0.029
Cumene	Air	µg	42.327	42.144	0.183
Cyanide	Air	mg	69.863	69.777	0.086
Cyfluthrin	Air	pg	448.476	448.476	0.000
Cyhalothrin, gamma-	Air	ng	5.147	5.147	0.000
Cypermethrin	Air	ng	1.088	1.088	0.000
Dicamba	Air	ng	15.113	15.113	0.000
Dichlorprop	Air	pg	798.353	798.353	0.000
Diflubenzuron	Air	pg	236.096	236.096	0.000
Dimethenamid	Air	pg	855.941	855.941	0.000
Dinitrogen monoxide	Air	g	2.048	2.041	0.006
Dioxin, 2,3,7,8 Tetrachlorodibenzo-p-	Air	ng	8.560	8.531	0.029
Esfenvalerate	Air	ng	2.682	2.682	0.000
Ethane	Air	mg	742.389	726.639	15.750
Ethane, 1,1-difluoro-, HFC-152a	Air	µg	4.116	4.116	0.000
Ethane, 1,1,1-trichloro-, HCFC-140	Air	µg	155.456	154.785	0.671
Ethane, 1,1,1,2-tetrafluoro-, HFC-134a	Air	µg	89.388	88.946	0.443
Ethane, 1,2-dichloro-	Air	µg	310.522	309.181	1.341
Ethane, 1,2-dichloro-1,1,2,2-tetrafluoro-, CFC-114	Air	mg	1.199	1.192	0.006
Ethanol	Air	mg	7.969	7.966	0.002
Ethene	Air	mg	284.649	284.644	0.005
Ethene, tetrachloro-	Air	µg	333.995	332.553	1.442
Ethephon	Air	pg	0.040	0.040	0.000
Ethylene oxide	Air	ng	73.821	73.767	0.054
Ethyne	Air	mg	58.684	58.684	0.000
Fenoxaprop	Air	ng	3.511	3.511	0.000
Fluazifop-p-butyl	Air	ng	5.038	5.038	0.000
Flufenacet	Air	ng	1.889	1.889	0.000
Flumetsulam	Air	pg	441.929	441.929	0.000
Flumiclorac-pentyl	Air	pg	756.189	756.189	0.000
Flumioxazin	Air	ng	7.649	7.649	0.000
Fluorine	Air	mg	3.517	3.517	0.000
Fomesafen	Air	ng	28.440	28.440	0.000
Formaldehyde	Air	mg	160.612	160.600	0.012
Formic acid	Air	mg	175.587	175.587	0.000
Furan	Air	mg	50.362	50.361	0.000
Glyphosate	Air	µg	5.695	5.695	0.000
Heat, waste	Air	MJ	416.161	414.404	1.756
Helium	Air	mg	226.210	225.571	0.638
Hexane	Air	mg	18.068	18.021	0.047

Hydrocarbons, aliphatic, alkanes, cyclic	Air	mg	4.502	4.483	0.019
Hydrocarbons, aliphatic, alkanes, unspecified	Air	mg	18.472	18.354	0.119
Hydrocarbons, aliphatic, unsaturated	Air	mg	3.250	3.238	0.013
Hydrocarbons, aromatic	Air	mg	5.205	5.161	0.044
Hydrocarbons, chlorinated	Air	mg	1.578	1.571	0.007
Hydrocarbons, unspecified	Air	µg	7.327	7.327	0.000
Hydrogen-3, Tritium	Air	kBq	5.894	5.861	0.033
Hydrogen chloride	Air	g	9.627	9.586	0.041
Hydrogen fluoride	Air	g	1.206	1.201	0.005
Hydrogen sulfide	Air	mg	11.071	10.911	0.160
Imazamox	Air	ng	1.131	1.131	0.000
Imazaquin	Air	ng	3.606	3.606	0.000
Imazethapyr	Air	ng	7.464	7.464	0.000
Iodine	Air	mg	2.326	2.321	0.005
Iodine-129	Air	mBq	13.320	13.072	0.248
Iodine-131	Air	mBq	779.309	766.033	13.275
Iodine-133	Air	Bq	2.410	2.397	0.013
Iodine-135	Air	Bq	5.226	5.198	0.028
Iron	Air	mg	4.515	4.511	0.004
Isoprene	Air	mg	2.314	2.314	0.000
Krypton-85	Air	Bq	2.557	2.477	0.080
Krypton-85m	Air	Bq	4.339	4.332	0.007
Krypton-87	Air	mBq	711.416	709.199	2.218
Krypton-88	Air	mBq	933.596	931.187	2.409
Krypton-89	Air	mBq	392.336	391.570	0.766
Lactofen	Air	ng	3.632	3.632	0.000
Lambda-cyhalothrin	Air	pg	0.001	0.001	0.000
Lanthanum-140	Air	µBq	18.555	18.522	0.033
Lead	Air	mg	17.219	17.196	0.023
Lead-210	Air	Bq	6.479	6.452	0.027
m-Xylene	Air	ng	29.628	29.628	0.000
Magnesium	Air	mg	85.943	85.523	0.420
Manganese	Air	mg	7.838	7.820	0.018
Manganese-54	Air	µBq	1.727	1.724	0.003
MCPB	Air	ng	1.096	1.096	0.000
Mercury	Air	mg	1.412	1.406	0.005
Methane, biogenic	Air	g	5.499	5.495	0.004
Methane, bromochlorodifluoro-, Halon 1211	Air	µg	25.098	18.921	6.177
Methane, bromotrifluoro-, Halon 1301	Air	mg	2.303	2.297	0.006
Methane, chlorodifluoro-, HCFC-22	Air	mg	2.318	2.298	0.019
Methane, dichloro-, HCC-30	Air	mg	2.255	2.245	0.010
Methane, dichlorodifluoro-, CFC-12	Air	ng	170.498	168.985	1.513
Methane, fossil	Air	g	214.873	213.778	1.095
Methane, land transformation	Air	µg	832.228	832.228	0.000
Methane, monochloro-, R-40	Air	mg	4.117	4.100	0.018
Methanol	Air	mg	486.526	486.466	0.060
Methomyl	Air	pg	0.136	0.136	0.000
Methyl ethyl ketone	Air	ng	5.422	5.422	0.000
Metolachlor	Air	ng	61.595	61.595	0.000
Metribuzin	Air	ng	23.555	23.555	0.000
Molybdenum	Air	µg	35.876	35.798	0.079
Nickel	Air	mg	19.369	19.298	0.071
Niobium-95	Air	mBq	827.872	827.872	0.000
Nitrate	Air	mg	1.142	1.135	0.006
Nitrogen oxides	Air	g	138.140	137.652	0.489
NMVOC, non-methane volatile organic compounds, unspecified origin	Air	g	89.929	89.698	0.231

Noble gases, radioactive, unspecified	Air	kBq	146.360	143.874	2.486
Ozone	Air	mg	342.888	340.926	1.962
PAH, polycyclic aromatic hydrocarbons	Air	mg	9.179	9.148	0.032
Paraquat	Air	ng	15.153	15.153	0.000
Parathion, methyl	Air	ng	2.908	2.908	0.000
Particulates, < 2.5 um	Air	g	18.506	18.480	0.027
Particulates, > 10 um	Air	g	60.882	60.664	0.218
Particulates, > 2.5 um, and < 10um	Air	g	16.096	16.076	0.021
Pendimethalin	Air	ng	164.368	164.368	0.000
Pentane	Air	mg	16.549	16.541	0.009
Permethrin	Air	ng	2.372	2.372	0.000
Phenol	Air	µg	947.754	946.902	0.851
Phenol, pentachloro-	Air	mg	2.364	2.364	0.000
Phosphorus	Air	µg	72.129	71.916	0.213
Platinum	Air	pg	794.574	791.742	2.833
Plutonium-238	Air	nBq	1.817	1.783	0.034
Plutonium-alpha	Air	nBq	4.165	4.088	0.078
Polonium-210	Air	Bq	7.558	7.529	0.030
Potassium	Air	µg	262.333	262.076	0.257
Potassium-40	Air	Bq	6.893	6.864	0.029
Propanal	Air	µg	2.684	2.684	0.000
Propane	Air	mg	328.314	324.511	3.803
Propene	Air	mg	198.492	198.491	0.001
Propiconazole	Air	ng	2.788	2.788	0.000
Propionic acid	Air	µg	190.086	190.086	0.000
Protactinium-234	Air	Bq	1.089	1.084	0.005
Prothioconazol	Air	pg	0.003	0.003	0.000
Pyraclostrobin (prop)	Air	ng	6.563	6.563	0.000
Quizalofop ethyl ester	Air	pg	880.584	880.584	0.000
Radioactive species, other beta emitters	Air	µBq	45.388	44.202	1.186
Radium-226	Air	Bq	5.700	5.672	0.029
Radium-228	Air	mBq	965.312	961.325	3.987
Radon-220	Air	Bq	144.463	143.849	0.614
Radon-222	Air	kBq	356.082	354.116	1.966
Ruthenium-103	Air	nBq	45.034	44.953	0.081
Scandium	Air	µg	2.710	2.696	0.014
Selenium	Air	mg	10.458	10.413	0.045
Sethoxydim	Air	ng	1.895	1.895	0.000
Silicon	Air	mg	4.023	4.015	0.008
Silicon tetrafluoride	Air	µg	6.194	6.106	0.088
Silver	Air	ng	238.048	230.746	7.302
Silver-110	Air	nBq	823.709	822.906	0.803
Sodium	Air	mg	1.359	1.358	0.001
Strontium	Air	µg	833.211	832.130	1.081
Styrene	Air	µg	222.877	222.041	0.836
Sulfate	Air	mg	8.998	8.949	0.049
Sulfentrazone	Air	ng	18.125	18.125	0.000
Sulfur dioxide	Air	g	344.242	342.987	1.255
Sulfur hexafluoride	Air	mg	10.069	10.020	0.050
Sulfuric acid	Air	µg	52.788	52.788	0.000
Tebuconazole	Air	pg	0.009	0.009	0.000
Tefluthrin	Air	pg	219.299	219.299	0.000
Terpenes	Air	mg	21.879	21.879	0.000
Thallium	Air	µg	1.092	1.092	0.000
Thifensulfuron	Air	pg	258.319	258.319	0.000
Thiodicarb	Air	pg	920.594	920.594	0.000

Thorium	Air	ng	156.838	156.561	0.277
Thorium-228	Air	mBq	631.212	628.583	2.629
Thorium-230	Air	Bq	1.469	1.462	0.007
Thorium-232	Air	mBq	652.064	649.403	2.662
Thorium-234	Air	Bq	1.089	1.084	0.005
Tin	Air	mg	2.580	2.580	0.001
Titanium	Air	µg	25.115	25.071	0.043
Toluene	Air	mg	49.199	49.162	0.037
Trifloxystrobin	Air	pg	165.287	165.287	0.000
Trifluralin	Air	ng	261.047	261.047	0.000
Tungsten	Air	ng	342.518	340.617	1.901
Uranium	Air	ng	91.180	91.040	0.141
Uranium-234	Air	Bq	3.306	3.291	0.016
Uranium-235	Air	mBq	64.742	64.383	0.359
Uranium-238	Air	Bq	3.484	3.468	0.016
Uranium alpha	Air	Bq	6.202	6.167	0.034
Vanadium	Air	mg	1.654	1.654	0.000
Water	Air	µg	480.842	480.474	0.368
Water/m3	Air	cu.in	73.244	73.244	0.000
Xenon-131m	Air	Bq	3.744	3.733	0.011
Xenon-133	Air	Bq	209.304	208.948	0.356
Xenon-133m	Air	mBq	145.437	144.350	1.086
Xenon-135	Air	Bq	74.374	74.229	0.145
Xenon-135m	Air	Bq	34.203	34.116	0.087
Xenon-137	Air	Bq	1.073	1.071	0.002
Xenon-138	Air	Bq	8.020	8.003	0.017
Xylene	Air	mg	28.660	28.583	0.077
Zinc	Air	mg	44.235	44.215	0.020
Zinc-65	Air	µBq	8.624	8.609	0.016
Zirconium	Air	µg	1.760	1.756	0.003
Zirconium-95	Air	µBq	15.397	15.381	0.015
Aluminium	Air	mg	386.918	384.771	2.148
Ammonia	Air	µg	4.035	4.035	0.000
Antimony	Air	µg	34.886	34.692	0.194
Arsenic	Air	mg	2.051	2.039	0.011
Barium	Air	mg	2.241	2.229	0.012
Beryllium	Air	µg	48.840	48.569	0.271
Boron	Air	µg	650.149	646.541	3.609
Cadmium	Air	µg	52.858	52.564	0.293
Calcium	Air	mg	125.801	125.103	0.698
Chlorine	Air	mg	4.799	4.773	0.027
Chromium VI	Air	µg	249.488	248.103	1.385
Cobalt	Air	µg	310.803	309.078	1.725
Copper	Air	mg	3.277	3.259	0.018
Dinitrogen monoxide	Air	µg	3.706	3.706	0.000
Dioxin, 2,3,7,8 Tetrachlorodibenzo-p-	Air	pg	0.025	0.025	0.000
Ethane, 1,1,2-trichloro-1,2,2-trifluoro-, CFC-113	Air	ng	695.380	695.380	0.000
Fluorine	Air	mg	23.575	23.444	0.131
Hydrogen sulfide	Air	µg	687.563	687.563	0.000
Iron	Air	mg	420.747	418.412	2.335
Lead	Air	mg	3.467	3.448	0.019
Magnesium	Air	mg	38.586	38.372	0.214
Manganese	Air	mg	8.700	8.652	0.048
Mercury	Air	µg	26.640	26.492	0.148
Molybdenum	Air	µg	673.407	669.669	3.738
Nickel	Air	µg	710.407	706.464	3.943

Nitrate	Air	mg	3.319	3.301	0.018
Nitrogen oxides	Air	ng	678.050	678.050	0.000
Particulates, < 2.5 um	Air	mg	309.018	307.305	1.713
Particulates, > 10 um	Air	mg	771.722	767.439	4.284
Particulates, > 2.5 um, and < 10um	Air	mg	463.033	460.463	2.570
Phosphorus	Air	µg	650.149	646.541	3.609
Potassium	Air	mg	66.178	65.810	0.367
Radon-222	Air	kBq	14800.222	14718.073	82.150
Scandium	Air	mg	1.385	1.377	0.008
Selenium	Air	µg	193.459	192.385	1.074
Silicon	Air	mg	86.158	85.680	0.478
Silver	Air	µg	57.932	57.610	0.322
Sodium	Air	mg	22.729	22.603	0.126
Strontium	Air	mg	1.406	1.398	0.008
Sulfate	Air	mg	356.261	354.283	1.977
Tin	Air	µg	80.661	80.213	0.448
Titanium	Air	mg	25.266	25.126	0.140
Tungsten	Air	µg	156.459	155.590	0.868
Vanadium	Air	mg	2.400	2.386	0.013
Zinc	Air	mg	2.484	2.471	0.014
Benzene	Air	ng	48.214	48.178	0.036
Butadiene	Air	ng	45.677	45.643	0.034
Cadmium	Air	pg	24.168	24.150	0.018
Carbon dioxide, fossil	Air	mg	7.613	7.607	0.006
Carbon monoxide, fossil	Air	µg	8.942	8.935	0.007
Chromium	Air	pg	120.840	120.750	0.090
Copper	Air	ng	4.108	4.105	0.003
Dinitrogen monoxide	Air	ng	72.504	72.450	0.054
Ethylene oxide	Air	ng	441.538	441.209	0.329
Formaldehyde	Air	ng	380.657	380.373	0.284
Heat, waste	Air	J	107.464	107.382	0.082
Hydrogen chloride	Air	ng	2.078	2.077	0.002
Lead	Air	pg	48.337	48.301	0.036
Mercury	Air	pg	0.169	0.169	0.000
Methane, fossil	Air	ng	120.840	120.750	0.090
Nickel	Air	pg	169.174	169.048	0.126
Nitrogen oxides	Air	µg	124.463	124.438	0.025
NMVOC, non-methane volatile organic compounds, unspecified origin	Air	µg	1.622	1.620	0.001
Particulates, < 2.5 um	Air	ng	91.838	91.770	0.068
Selenium	Air	pg	24.168	24.150	0.018
Sulfur dioxide	Air	µg	2.417	2.415	0.002
Water	Air	mg	2.922	2.920	0.002
Water/m3	Air	mm3	0.075	0.075	0.000
Zinc	Air	ng	2.417	2.415	0.002
2-Hexanone	Water	µg	771.603	635.583	136.020
4-Methyl-2-pentanone	Water	µg	497.814	410.269	87.545
Acetone	Water	mg	1.185	0.976	0.208
Acidity, unspecified	Water	µg	60.030	60.029	0.000
Acids, unspecified	Water	µg	14.252	14.021	0.231
Allyl chloride	Water	ng	805.325	805.325	0.000
Aluminium	Water	g	10.039	8.241	1.798
Ammonia	Water	g	2.192	1.802	0.390
Ammonia, as N	Water	µg	7.157	7.041	0.116
Ammonium, ion	Water	mg	9.093	8.993	0.101
Antimony	Water	mg	6.143	5.022	1.121
AOX, Adsorbable Organic Halogen as Cl	Water	µg	180.817	180.717	0.100

Arsenic	Water	mg	32.596	26.887	5.709
Barium	Water	g	135.022	110.422	24.600
Benzene	Water	mg	198.717	163.771	34.946
Benzene, 1-methyl-4-(1-methylethyl)-	Water	µg	11.809	9.727	2.082
Benzene, ethyl-	Water	mg	11.178	9.213	1.966
Benzene, pentamethyl-	Water	µg	8.857	7.295	1.561
Benzenes, alkylated, unspecified	Water	mg	5.386	4.403	0.983
Benzoic acid	Water	mg	119.875	98.743	21.132
Beryllium	Water	mg	1.778	1.460	0.318
Biphenyl	Water	µg	348.733	285.064	63.668
BOD5, Biological Oxygen Demand	Water	kg	1.602	1.598	0.004
Borate	Water	ng	47.100	47.100	0.000
Boron	Water	mg	371.789	306.407	65.382
Bromide	Water	g	25.318	20.855	4.463
Bromine	Water	mg	61.200	61.199	0.000
Cadmium	Water	mg	5.129	4.285	0.844
Calcium	Water	g	380.544	313.625	66.919
Carbonate	Water	µg	1.611	1.611	0.000
Carboxylic acids, unspecified	Water	ng	2.606	2.606	0.000
Chloride	Water	kg	4.278	3.526	0.752
Chlorides, unspecified	Water	mg	32.076	32.076	0.000
Chlorine	Water	ng	498.157	498.157	0.000
Chromium	Water	mg	260.462	213.092	47.370
Chromium III	Water	mg	19.010	15.417	3.593
Chromium VI	Water	mg	1.363	1.164	0.199
Cobalt	Water	mg	2.624	2.163	0.462
COD, Chemical Oxygen Demand	Water	g	41.304	34.072	7.232
Copper	Water	mg	41.057	35.081	5.976
Cu-HDO	Water	pg	5.429	5.429	0.000
Cyanide	Water	mg	2.705	2.704	0.002
Decane	Water	mg	3.445	2.837	0.607
Detergent, oil	Water	mg	100.167	82.651	17.517
Dibenzofuran	Water	µg	22.469	18.508	3.961
Dibenzothiophene	Water	µg	19.281	15.876	3.406
Dichromate	Water	ng	41.769	41.769	0.000
DOC, Dissolved Organic Carbon	Water	mg	91.413	91.381	0.032
Docosane	Water	µg	126.450	104.159	22.291
Dodecane	Water	mg	6.536	5.383	1.152
Eicosane	Water	mg	1.799	1.482	0.317
Ethanol	Water	pg	794.989	794.989	0.000
Fluorene, 1-methyl-	Water	µg	13.449	11.078	2.371
Fluorenes, alkylated, unspecified	Water	µg	312.143	255.154	56.988
Fluoride	Water	mg	93.633	91.937	1.696
Fluorine	Water	µg	154.400	126.275	28.125
Fluosilicic acid	Water	µg	6.848	6.848	0.000
Formaldehyde	Water	mg	17.939	17.929	0.010
Heat, waste	Water	kJ	76.240	76.164	0.076
Hexadecane	Water	mg	7.134	5.876	1.258
Hexanoic acid	Water	mg	24.825	20.449	4.376
Hydrocarbons, aliphatic, unsaturated	Water	pg	3.419	3.419	0.000
Hydrocarbons, unspecified	Water	µg	87.738	87.269	0.470
Hydrogen chloride	Water	mg	3.096	3.096	0.000
Hydroxide	Water	ng	164.153	164.153	0.000
Iron	Water	g	20.211	16.620	3.590
Lead	Water	mg	69.087	57.077	12.010
Lead-210	Water	mBq	82.619	82.619	0.000

Lead-210/kg	Water	pg	12.278	10.114	2.164
Lithium	Water	g	11.953	10.823	1.129
m-Xylene	Water	mg	3.589	2.958	0.631
Magnesium	Water	g	74.392	61.310	13.082
Manganese	Water	mg	276.177	252.470	23.707
Mercury	Water	µg	143.273	123.482	19.790
Metallic ions, unspecified	Water	ng	668.558	657.710	10.847
Methane, monochloro-, R-40	Water	µg	4.756	3.918	0.838
Methanol	Water	mg	5.382	5.379	0.003
Methyl ethyl ketone	Water	µg	9.513	7.836	1.677
Molybdenum	Water	mg	2.723	2.244	0.479
Monoethanolamine	Water	ng	19.546	19.546	0.000
n-Hexacosane	Water	µg	78.889	64.982	13.907
Naphthalene	Water	mg	2.153	1.773	0.380
Naphthalene, 2-methyl-	Water	mg	1.872	1.542	0.330
Naphthalenes, alkylated, unspecified	Water	µg	88.261	72.147	16.114
Nickel	Water	mg	33.247	27.617	5.630
Nitrate	Water	µg	2.557	2.557	0.000
Nitrate compounds	Water	ng	193.146	190.013	3.134
Nitric acid	Water	µg	433.235	426.206	7.029
Nitrite	Water	ng	4.564	4.564	0.000
Nitrogen	Water	µg	99.884	99.884	0.000
Nitrogen, total	Water	mg	13.798	13.547	0.251
o-Cresol	Water	mg	3.399	2.800	0.599
o-Xylene	Water	µg	6.300	6.300	0.000
Octadecane	Water	mg	1.762	1.452	0.311
Oils, unspecified	Water	g	2.777	2.297	0.481
p-Cresol	Water	mg	3.668	3.021	0.647
PAH, polycyclic aromatic hydrocarbons	Water	ng	593.288	593.288	0.000
Phenanthrene	Water	µg	32.024	26.243	5.781
Phenanthrenes, alkylated, unspecified	Water	µg	36.596	29.915	6.681
Phenol	Water	mg	49.781	40.959	8.821
Phenol, 2,4-dimethyl-	Water	mg	3.310	2.727	0.583
Phenols, unspecified	Water	mg	11.528	9.827	1.701
Phosphate	Water	µg	24.285	24.285	0.000
Phosphorus	Water	mg	1.805	1.804	0.001
Polychlorinated biphenyls	Water	pg	407.406	407.406	0.000
Potassium	Water	pg	328.803	328.803	0.000
Radioactive species, Nuclides, unspecified	Water	Bq	805.073	790.412	14.661
Radium-226	Water	mBq	377.997	377.997	0.001
Radium-226/kg	Water	ng	4.272	3.519	0.753
Radium-228	Water	mBq	531.896	531.895	0.001
Radium-228/kg	Water	pg	21.850	17.999	3.852
Selenium	Water	mg	3.132	2.879	0.253
Silver	Water	mg	248.778	205.024	43.754
Sodium	Water	kg	1.206	0.994	0.212
Solids, inorganic	Water	µg	64.386	64.368	0.018
Strontium	Water	g	6.458	5.322	1.136
Sulfate	Water	g	19.894	18.174	1.719
Sulfide	Water	mg	5.553	4.530	1.023
Sulfur	Water	mg	313.842	258.650	55.191
Suspended solids, unspecified	Water	kg	5.582	4.599	0.983
Tar	Water	ng	10.916	10.739	0.177
Tetradecane	Water	mg	2.864	2.359	0.505
Thallium	Water	mg	1.295	1.058	0.236
Tin	Water	mg	25.368	20.803	4.565

Titanium	Water	mg	94.684	77.470	17.214
TOC, Total Organic Carbon	Water	mg	92.540	92.508	0.032
Toluene	Water	mg	187.744	154.728	33.016
Triethylene glycol	Water	µg	1.671	1.671	0.000
Vanadium	Water	mg	3.217	2.651	0.566
VOC, volatile organic compounds, unspecified origin	Water	µg	9.025	9.025	0.000
Water, AT	Water	dm3	364.076	364.076	0.000
Water, AU	Water	dm3	100.421	100.421	0.000
Water, BA	Water	cu.in	308.369	308.369	0.000
Water, BE	Water	cu.in	395.468	395.468	0.000
Water, BG	Water	dm3	33.466	33.466	0.000
Water, BR	Water	dm3	562.104	562.104	0.000
Water, CA	Water	dm3	575.714	575.714	0.000
Water, CH	Water	dm3	350.122	350.122	0.000
Water, CL	Water	dm3	153.506	153.506	0.000
Water, CN	Water	m3	6.987	6.987	0.000
Water, CY	Water	cm3	47.214	47.214	0.000
Water, CZ	Water	fl. oz	904.879	904.879	0.000
Water, DE	Water	dm3	200.722	200.722	0.000
Water, DK	Water	cm3	342.812	342.812	0.000
Water, EE	Water	cm3	669.086	669.086	0.000
Water, ES	Water	dm3	139.111	139.111	0.000
Water, Europe without Switzerland	Water	cm3	118.749	118.749	0.000
Water, FI	Water	dm3	56.784	56.784	0.000
Water, FR	Water	dm3	561.620	561.620	0.000
Water, GB	Water	dm3	52.340	52.340	0.000
Water, GLO	Water	cu.in	824.742	824.742	0.000
Water, GR	Water	dm3	39.042	39.042	0.000
Water, HR	Water	cu.in	153.052	153.052	0.000
Water, HU	Water	cu.in	174.209	174.209	0.000
Water, IAI Area, Africa	Water	mm3	121.417	121.417	0.000
Water, IAI Area, Asia, without China and GCC	Water	mm3	220.799	220.799	0.000
Water, IAI Area, EU27 & EFTA	Water	mm3	924.098	924.098	0.000
Water, IAI Area, Gulf Cooperation Council	Water	mm3	267.191	267.191	0.000
Water, IAI Area, North America, without Quebec	Water	mm3	163.849	163.849	0.000
Water, IAI Area, Russia & RER w/o EU27 & EFTA	Water	mm3	357.554	357.554	0.000
Water, IAI Area, South America	Water	mm3	149.945	149.945	0.000
Water, ID	Water	fl. oz	681.821	681.821	0.000
Water, IE	Water	cu.in	449.808	449.808	0.000
Water, IL	Water	mm3	0.288	0.288	0.000
Water, IN	Water	dm3	136.012	136.012	0.000
Water, IR	Water	dm3	96.036	96.036	0.000
Water, IS	Water	fl. oz	738.203	738.203	0.000
Water, IT	Water	dm3	134.132	134.132	0.000
Water, JP	Water	dm3	463.721	463.721	0.000
Water, KR	Water	fl. oz	965.977	965.977	0.000
Water, LT	Water	cu.in	241.570	241.570	0.000
Water, LU	Water	cu.in	201.720	201.720	0.000
Water, LV	Water	dm3	31.633	31.633	0.000
Water, MA	Water	mm3	829.216	829.216	0.000
Water, MK	Water	cu.in	121.993	121.993	0.000
Water, MT	Water	cm3	37.336	37.336	0.000
Water, MX	Water	dm3	248.459	248.459	0.000
Water, MY	Water	fl. oz	867.325	867.325	0.000
Water, NL	Water	cu.in	136.813	136.813	0.000
Water, NO	Water	fl. oz	959.158	959.158	0.000

Water, NORDEL	Water	mm3	261.975	261.975	0.000
Water, PE	Water	cu.in	185.922	185.922	0.000
Water, PG	Water	mm3	813.840	813.840	0.000
Water, PH	Water	mm3	30.247	30.247	0.000
Water, PL	Water	dm3	30.103	30.103	0.000
Water, PT	Water	dm3	38.568	38.568	0.000
Water, RAF	Water	cm3	43.650	43.650	0.000
Water, RAS	Water	cm3	771.309	771.309	0.000
Water, RER	Water	cu.in	570.752	570.752	0.000
Water, RLA	Water	cm3	379.226	379.226	0.000
Water, RME	Water	cm3	429.227	429.227	0.000
Water, RNA	Water	cm3	964.109	964.109	0.000
Water, RO	Water	dm3	110.121	110.121	0.000
Water, RoW	Water	m3	61.179	61.179	0.000
Water, RS	Water	dm3	79.932	79.932	0.000
Water, RU	Water	dm3	834.218	834.218	0.000
Water, SA	Water	cu.in	221.662	221.662	0.000
Water, SE	Water	dm3	667.985	667.985	0.000
Water, SI	Water	dm3	47.288	47.288	0.000
Water, SK	Water	dm3	38.535	38.535	0.000
Water, TH	Water	cu.in	783.834	783.834	0.000
Water, TR	Water	dm3	263.999	263.999	0.000
Water, TW	Water	dm3	43.416	43.416	0.000
Water, TZ	Water	cu.in	147.581	147.581	0.000
Water, UA	Water	dm3	95.513	95.513	0.000
Water, UCTE	Water	mm3	0.940	0.940	0.000
Water, UCTE without Germany	Water	mm3	0.494	0.494	0.000
Water, UN-OCEANIA	Water	mm3	159.056	159.056	0.000
Water, US	Water	m3	1.667	1.667	0.000
Water, WEU	Water	cm3	111.654	111.654	0.000
Water, ZA	Water	cu.in	335.843	335.843	0.000
Xylene	Water	mg	100.649	82.921	17.729
Yttrium	Water	µg	796.369	655.983	140.386
Zinc	Water	mg	313.115	270.153	42.962
BOD5, Biological Oxygen Demand	Water	kg	1.059	0.000	1.059
2-Methyl-4-chlorophenoxyacetic acid	Water	pg	96.753	96.753	0.000
2,4-D amines	Water	ng	3.465	3.465	0.000
2,4-D ester	Water	pg	762.486	762.486	0.000
2,4-DB	Water	ng	1.658	1.658	0.000
Aluminium	Water	mg	56.839	56.654	0.185
Ammonium, ion	Water	mg	18.105	18.028	0.077
Antimony	Water	µg	364.459	362.641	1.819
Arsenic	Water	mg	1.346	1.338	0.008
Atrazine	Water	ng	29.509	29.509	0.000
Barium	Water	mg	1.376	1.371	0.006
Bentazone	Water	ng	1.014	1.014	0.000
Beryllium	Water	µg	189.454	188.793	0.661
BOD5, Biological Oxygen Demand	Water	mg	7.116	7.108	0.008
Boron	Water	mg	306.528	306.370	0.159
Bromine	Water	µg	299.134	296.499	2.635
Bromoxynil	Water	ng	3.870	3.870	0.000
Cadmium	Water	µg	329.487	328.716	0.771
Calcium	Water	g	8.500	8.470	0.030
Carbaryl	Water	pg	3.432	3.432	0.000
Carbon	Water	µg	25.820	25.820	0.000
Chloride	Water	g	144.591	143.963	0.628

Chlorine	Water	µg	276.094	276.094	0.000
Chromium	Water	µg	86.610	86.590	0.020
Chromium VI	Water	µg	693.616	688.896	4.720
Cobalt	Water	mg	1.437	1.432	0.005
COD, Chemical Oxygen Demand	Water	mg	12.410	12.402	0.008
Copper	Water	mg	1.707	1.705	0.003
Dicamba	Water	ng	3.127	3.127	0.000
Dichlorprop	Water	pg	831.771	831.771	0.000
Dimethenamid	Water	pg	302.099	302.099	0.000
DOC, Dissolved Organic Carbon	Water	mg	4.008	4.008	0.000
Ethephon	Water	pg	0.003	0.003	0.000
Fluoride	Water	mg	93.453	93.121	0.332
Glyphosate	Water	ng	71.639	71.639	0.000
Iodide	Water	µg	36.030	35.707	0.323
Iron	Water	mg	831.110	826.119	4.991
Lambda-cyhalothrin	Water	pg	0.000	0.000	0.000
Lead	Water	µg	222.722	222.556	0.166
Lead-210	Water	mBq	1.979	1.950	0.028
Lithium	Water	ng	691.880	691.880	0.000
Magnesium	Water	g	3.237	3.225	0.012
Manganese	Water	mg	181.168	180.448	0.719
MCPB	Water	pg	11.680	11.680	0.000
Mercury	Water	µg	17.668	17.593	0.075
Methomyl	Water	pg	0.002	0.002	0.000
Metolachlor	Water	ng	4.079	4.079	0.000
Molybdenum	Water	mg	3.321	3.310	0.011
Nickel	Water	mg	7.619	7.586	0.032
Nitrate	Water	g	19.903	19.901	0.002
Nitrogen, organic bound	Water	µg	72.156	72.156	0.000
Organic carbon	Water	µg	61.067	61.067	0.000
PAH, polycyclic aromatic hydrocarbons	Water	µg	2.076	2.076	0.000
Pendimethalin	Water	pg	415.736	415.736	0.000
Phosphate	Water	g	15.346	15.305	0.040
Phosphorus	Water	mg	11.446	11.446	0.000
Polonium-210	Water	mBq	3.011	2.968	0.043
Potassium	Water	mg	495.961	493.888	2.073
Potassium-40	Water	µBq	239.162	235.745	3.417
Propiconazole	Water	pg	3.993	3.993	0.000
Prothioconazol	Water	pg	0.000	0.000	0.000
Pyraclostrobin (prop)	Water	pg	0.017	0.017	0.000
Radium-226	Water	mBq	2.220	2.188	0.032
Scandium	Water	µg	287.216	285.999	1.216
Selenium	Water	µg	573.781	571.698	2.082
Silicon	Water	mg	385.957	384.148	1.810
Silver	Water	µg	79.565	79.250	0.315
Sodium	Water	g	1.699	1.692	0.008
Sodium chlorate	Water	ng	24.252	24.252	0.000
Solids, inorganic	Water	g	2.618	2.604	0.015
Strontium	Water	mg	166.703	166.016	0.687
Sulfate	Water	g	113.524	113.269	0.255
Sulfur	Water	mg	1.166	1.166	0.000
Suspended solids, unspecified	Water	g	2.093	2.084	0.009
Tebuconazole	Water	pg	0.003	0.003	0.000
Tefluthrin	Water	pg	0.001	0.001	0.000
Thallium	Water	µg	16.131	16.108	0.022
Thorium-228	Water	µBq	24.260	23.913	0.347

Thorium-232	Water	nBq	367.643	367.643	0.000
Tin	Water	µg	129.287	129.188	0.099
Titanium	Water	µg	652.836	651.148	1.689
TOC, Total Organic Carbon	Water	mg	4.008	4.008	0.000
Trifloxystrobin	Water	pg	0.000	0.000	0.000
Tungsten	Water	mg	1.660	1.658	0.002
Uranium-238	Water	mBq	1.015	1.001	0.015
Vanadium	Water	µg	507.380	505.006	2.374
Water, AR	Water	mm3	66.782	66.782	0.000
Water, BE	Water	mm3	0.153	0.153	0.000
Water, BR	Water	cm3	86.523	86.523	0.000
Water, CA	Water	cm3	35.007	35.007	0.000
Water, CH	Water	cm3	8.794	8.794	0.000
Water, CI	Water	mm3	165.259	165.259	0.000
Water, CL	Water	mm3	3.006	3.006	0.000
Water, CN	Water	mm3	932.498	932.498	0.000
Water, CO	Water	mm3	10.612	10.612	0.000
Water, CR	Water	mm3	1.957	1.957	0.000
Water, DE	Water	mm3	253.031	253.031	0.000
Water, EC	Water	mm3	22.178	22.178	0.000
Water, ES	Water	mm3	187.306	187.306	0.000
Water, Europe without Switzerland	Water	cm3	19.965	19.965	0.000
Water, FI	Water	mm3	0.854	0.854	0.000
Water, FR	Water	mm3	54.910	54.910	0.000
Water, GH	Water	mm3	160.594	160.594	0.000
Water, GLO	Water	cm3	4.473	4.473	0.000
Water, ID	Water	mm3	81.390	81.390	0.000
Water, IL	Water	mm3	0.711	0.711	0.000
Water, IN	Water	cm3	3.261	3.261	0.000
Water, IT	Water	mm3	13.997	13.997	0.000
Water, MX	Water	mm3	48.673	48.673	0.000
Water, MY	Water	mm3	504.163	504.163	0.000
Water, NL	Water	mm3	0.696	0.696	0.000
Water, NZ	Water	mm3	0.015	0.015	0.000
Water, PE	Water	mm3	5.299	5.299	0.000
Water, PH	Water	mm3	417.440	417.440	0.000
Water, RER	Water	mm3	185.403	185.403	0.000
Water, RNA	Water	mm3	0.666	0.666	0.000
Water, RoW	Water	cm3	177.229	177.229	0.000
Water, RU	Water	mm3	24.385	24.385	0.000
Water, TR	Water	mm3	1.316	1.316	0.000
Water, UA	Water	mm3	3.645	3.645	0.000
Water, US	Water	cm3	3.388	3.388	0.000
Water, VN	Water	mm3	14.603	14.603	0.000
Water, ZA	Water	mm3	1.445	1.445	0.000
Zinc	Water	mg	19.001	18.962	0.038
Aluminium	Water	g	132.035	76.886	55.149
Ammonium, ion	Water	mg	155.564	155.498	0.065
Antimony	Water	mg	254.144	67.784	186.360
Arsenic	Water	mg	315.764	239.378	76.386
Barium	Water	mg	889.672	885.616	4.056
Beryllium	Water	mg	54.348	54.175	0.173
BOD5, Biological Oxygen Demand	Water	g	36.477	36.340	0.137
Boron	Water	g	3.829	3.372	0.457
Bromine	Water	mg	16.116	16.071	0.045
Cadmium	Water	mg	124.277	105.127	19.150

Calcium	Water	g	709.121	660.905	48.216
Chloride	Water	g	83.591	80.198	3.393
Chromium VI	Water	g	1.084	1.009	0.075
Cobalt	Water	g	1.070	1.043	0.027
COD, Chemical Oxygen Demand	Water	kg	3.356	0.116	3.239
Copper	Water	g	86.011	1.615	84.396
DOC, Dissolved Organic Carbon	Water	kg	1.338	0.056	1.281
Fluoride	Water	g	13.769	7.615	6.154
Heat, waste	Water	MJ	2.667	2.665	0.001
Hydrogen sulfide	Water	mg	303.510	303.461	0.049
Iodide	Water	ng	898.947	898.585	0.362
Iron	Water	kg	1.385	0.083	1.301
Lead	Water	g	3.278	0.300	2.978
Magnesium	Water	g	362.445	302.014	60.430
Manganese	Water	g	62.459	32.749	29.710
Mercury	Water	mg	12.111	6.658	5.454
Molybdenum	Water	mg	413.381	188.355	225.026
Nickel	Water	g	10.379	3.765	6.613
Nitrate	Water	g	33.556	21.857	11.700
Nitrite	Water	mg	8.480	8.476	0.004
Nitrogen, organic bound	Water	mg	253.938	253.832	0.107
Phosphate	Water	g	79.970	75.226	4.745
Potassium	Water	g	234.559	216.265	18.294
Scandium	Water	mg	110.098	109.714	0.384
Selenium	Water	mg	134.188	133.835	0.354
Silicon	Water	g	798.712	773.608	25.104
Silver	Water	mg	7.254	7.247	0.007
Sodium	Water	g	259.032	253.078	5.954
Strontium	Water	g	8.502	8.471	0.032
Sulfate	Water	kg	2.178	2.048	0.130
Thallium	Water	mg	10.780	10.723	0.057
Tin	Water	g	4.175	0.096	4.079
Titanium	Water	g	3.191	3.061	0.131
TOC, Total Organic Carbon	Water	kg	1.338	0.056	1.281
Tungsten	Water	mg	122.166	122.047	0.119
Vanadium	Water	mg	776.904	615.684	161.220
Zinc	Water	g	8.952	7.611	1.341
Arsenic	Water	pg	0.615	0.247	0.368
Cadmium	Water	pg	0.523	0.210	0.313
Calcium	Water	mg	5.744	1.387	4.358
Copper	Water	pg	23.721	9.515	14.206
DOC, Dissolved Organic Carbon	Water	µg	107.843	101.749	6.094
Lead	Water	pg	1.549	0.621	0.927
Mercury	Water	pg	0.013	0.005	0.008
Nickel	Water	pg	2.103	0.844	1.260
Zinc	Water	pg	1.526	0.612	0.914
4-Methyl-2-pentanone	Water	µg	87.129	76.699	10.430
Acenaphthene	Water	µg	6.397	6.380	0.016
Acenaphthylene	Water	ng	400.052	399.026	1.026
Acetone	Water	µg	207.669	182.808	24.861
Acidity, unspecified	Water	mg	4.370	3.846	0.523
Actinides, radioactive, unspecified	Water	mBq	21.636	21.232	0.403
Aluminium	Water	mg	383.705	337.874	45.831
Ammonium, ion	Water	mg	395.054	364.129	30.925
Antimony	Water	µg	233.873	205.876	27.998
AOX, Adsorbable Organic Halogen as Cl	Water	µg	396.371	395.399	0.972

Arsenic	Water	mg	5.279	4.728	0.552
Barite	Water	mg	1.995	0.545	1.450
Barium	Water	g	6.812	6.102	0.710
Benzene	Water	mg	119.846	115.457	4.390
Benzene, ethyl-	Water	mg	26.645	26.347	0.298
Beryllium	Water	µg	208.324	183.385	24.939
BOD5, Biological Oxygen Demand	Water	g	113.124	112.401	0.723
Boron	Water	mg	74.093	66.260	7.833
Bromine	Water	g	5.175	4.639	0.535
Cadmium	Water	mg	1.021	0.940	0.081
Calcium	Water	g	103.901	95.807	8.094
Carbonate	Water	µg	95.688	95.688	0.000
Carboxylic acids, unspecified	Water	g	5.682	5.668	0.015
Cesium	Water	mg	1.028	1.026	0.003
Cesium-137	Water	Bq	2.479	2.433	0.046
Chloride	Water	kg	1.271	1.179	0.092
Chlorinated solvents, unspecified	Water	pg	0.009	0.003	0.006
Chromium	Water	mg	15.386	14.110	1.276
Cobalt	Water	µg	460.615	405.481	55.134
COD, Chemical Oxygen Demand	Water	g	117.226	116.216	1.010
Copper	Water	mg	3.362	3.009	0.353
Cyanide	Water	mg	3.761	3.751	0.010
DOC, Dissolved Organic Carbon	Water	g	36.084	35.989	0.095
Fluoride	Water	mg	158.453	158.050	0.403
Glutaraldehyde	Water	ng	246.351	67.325	179.027
Heat, waste	Water	MJ	11.868	11.804	0.064
Hydrocarbons, aliphatic, alkanes, unspecified	Water	mg	133.694	133.351	0.343
Hydrocarbons, aliphatic, unsaturated	Water	mg	12.341	12.309	0.032
Hydrocarbons, aromatic	Water	mg	550.083	548.669	1.413
Hydrocarbons, unspecified	Water	mg	6.072	6.032	0.041
Hydrogen-3, Tritium	Water	kBq	5.151	5.055	0.096
Hydrogen carbonate	Water	mg	10.514	10.514	0.000
Hypochlorite	Water	mg	1.409	1.396	0.013
Iodide	Water	mg	102.841	102.577	0.264
Iron	Water	g	1.260	1.116	0.144
Lead	Water	mg	13.380	12.570	0.810
Lead-210	Water	Bq	19.384	18.631	0.753
Lithium	Water	g	22.339	19.665	2.674
m-Xylene	Water	µg	629.558	554.192	75.366
Magnesium	Water	g	18.814	17.239	1.575
Manganese	Water	mg	66.670	64.027	2.642
Mercury	Water	µg	6.650	6.153	0.498
Methanol	Water	µg	72.984	68.553	4.431
Molybdenum	Water	µg	690.415	632.698	57.717
Nickel	Water	mg	4.248	3.811	0.437
Nitrate	Water	mg	176.193	175.716	0.477
Nitrite	Water	µg	33.570	32.944	0.626
Nitrogen	Water	mg	4.158	4.147	0.011
Nitrogen, organic bound	Water	mg	290.882	290.218	0.665
o-Xylene	Water	µg	458.575	403.678	54.897
Oils, unspecified	Water	g	35.327	35.186	0.140
PAH, polycyclic aromatic hydrocarbons	Water	mg	8.172	8.152	0.021
Phenol	Water	mg	138.210	136.763	1.447
Phosphate	Water	mg	225.549	224.987	0.562
Phosphorus	Water	mg	8.227	8.206	0.021
Polonium-210	Water	Bq	20.404	20.353	0.051

Potassium	Water	g	4.357	4.346	0.011
Potassium-40	Water	Bq	1.616	1.612	0.004
Radioactive species, Nuclides, unspecified	Water	Bq	12.935	12.694	0.241
Radium-224	Water	Bq	51.421	51.289	0.132
Radium-226	Water	Bq	124.843	121.301	3.542
Radium-228	Water	Bq	141.558	136.659	4.899
Rubidium	Water	mg	10.284	10.258	0.026
Selenium	Water	µg	365.208	358.862	6.346
Silicon	Water	ng	95.366	51.500	43.866
Silver	Water	mg	44.182	38.965	5.217
Sodium	Water	g	527.341	501.202	26.139
Strontium	Water	g	3.000	2.860	0.140
Strontium-90	Water	mBq	275.642	270.502	5.140
Sulfate	Water	g	16.689	16.050	0.639
Sulfide	Water	mg	2.155	2.150	0.005
Sulfur	Water	mg	69.546	62.913	6.633
Suspended solids, unspecified	Water	g	924.846	814.259	110.587
t-Butyl methyl ether	Water	mg	6.690	6.673	0.017
Thallium	Water	µg	49.395	43.482	5.913
Thorium-228	Water	Bq	205.846	205.318	0.528
Tin	Water	mg	2.286	2.013	0.274
Titanium	Water	mg	3.590	3.160	0.430
TOC, Total Organic Carbon	Water	g	36.603	36.507	0.095
Toluene	Water	mg	189.979	185.648	4.331
Tributyltin compounds	Water	mg	3.492	3.481	0.010
Triethylene glycol	Water	µg	62.660	58.972	3.688
Uranium-238	Water	Bq	6.859	6.842	0.017
Vanadium	Water	mg	1.201	1.132	0.069
VOC, volatile organic compounds, unspecified origin	Water	mg	359.944	359.021	0.923
Water, AT	Water	mm3	475.888	475.888	0.000
Water, BE	Water	mm3	994.315	994.315	0.000
Water, BG	Water	cm3	1.736	1.736	0.000
Water, CH	Water	mm3	77.576	77.576	0.000
Water, CN	Water	cm3	1.342	1.342	0.000
Water, CZ	Water	mm3	64.525	64.525	0.000
Water, DE	Water	cm3	5.469	5.469	0.000
Water, DK	Water	mm3	794.967	794.967	0.000
Water, ES	Water	mm3	697.647	697.647	0.000
Water, Europe without Switzerland	Water	mm3	16.895	16.895	0.000
Water, FI	Water	mm3	267.662	267.662	0.000
Water, FR	Water	cm3	2.131	2.131	0.000
Water, GB	Water	cm3	1.931	1.931	0.000
Water, GLO	Water	cm3	28.998	28.998	0.000
Water, HU	Water	mm3	271.618	271.618	0.000
Water, IAI Area, Africa	Water	mm3	101.125	101.125	0.000
Water, IAI Area, Asia, without China and GCC	Water	mm3	182.515	182.515	0.000
Water, IAI Area, EU27 & EFTA	Water	cm3	5.250	5.250	0.000
Water, IAI Area, Gulf Cooperation Council	Water	mm3	222.536	222.536	0.000
Water, IAI Area, North America, without Quebec	Water	mm3	127.699	127.699	0.000
Water, IAI Area, Russia & RER w/o EU27 & EFTA	Water	mm3	380.359	380.359	0.000
Water, IAI Area, South America	Water	mm3	107.895	107.895	0.000
Water, IT	Water	cm3	2.068	2.068	0.000
Water, JP	Water	cm3	3.431	3.431	0.000
Water, KR	Water	mm3	261.479	261.479	0.000
Water, LU	Water	mm3	43.135	43.135	0.000
Water, NL	Water	cm3	1.952	1.952	0.000

Water, NO	Water	mm3	105.398	105.398	0.000
Water, PL	Water	mm3	38.082	38.082	0.000
Water, PT	Water	mm3	246.323	246.323	0.000
Water, RER	Water	cm3	7.968	7.968	0.000
Water, RNA	Water	mm3	0.000	0.000	0.000
Water, RoW	Water	cm3	2.990	2.990	0.000
Water, RU	Water	cm3	1.329	1.329	0.000
Water, SE	Water	cm3	1.374	1.374	0.000
Water, SK	Water	mm3	24.234	24.234	0.000
Water, TR	Water	mm3	50.957	50.957	0.000
Water, TW	Water	cm3	1.279	1.279	0.000
Water, UN-OCEANIA	Water	mm3	132.473	132.473	0.000
Water, US	Water	mm3	0.571	0.571	0.000
Xylene	Water	mg	138.228	135.924	2.304
Zinc	Water	mg	87.653	86.154	1.499
1-Butanol	Water	µg	228.108	228.056	0.052
1-Pentanol	Water	mg	8.657	8.657	0.000
1-Pentene	Water	mg	6.542	6.542	0.000
1-Propanol	Water	mg	11.567	11.567	0.000
1,4-Butanediol	Water	µg	11.581	11.581	0.000
2-Aminopropanol	Water	ng	928.263	928.122	0.141
2-Butene, 2-methyl-	Water	µg	1.453	1.453	0.000
2-Methyl-1-propanol	Water	mg	14.899	14.899	0.000
2-Methyl-4-chlorophenoxyacetic acid	Water	ng	2.527	2.527	0.000
2-Propanol	Water	µg	3.252	3.251	0.001
2,4-D amines	Water	pg	14.160	14.160	0.000
2,4-D ester	Water	pg	2.917	2.917	0.000
2,4-DB	Water	pg	6.833	6.833	0.000
4-Methyl-2-pentanol	Water	pg	0.063	0.063	0.000
Acenaphthene	Water	µg	15.960	15.919	0.041
Acenaphthylene	Water	ng	977.353	974.770	2.583
Acetaldehyde	Water	mg	73.174	73.174	0.000
Acetic acid	Water	mg	279.036	279.019	0.017
Acetone	Water	mg	6.952	6.952	0.000
Acetonitrile	Water	ng	206.915	206.870	0.045
Acetyl chloride	Water	mg	6.801	6.801	0.000
Acidity, unspecified	Water	mg	704.966	704.964	0.001
Acrylate	Water	ng	97.476	78.658	18.818
Aluminium	Water	mg	273.822	267.857	5.965
Ammonium, ion	Water	g	4.802	4.796	0.005
Aniline	Water	µg	43.896	43.890	0.006
Anthracene	Water	ng	74.040	74.040	0.000
Antimony	Water	mg	11.503	10.574	0.928
Antimony-122	Water	µBq	237.902	237.670	0.232
Antimony-124	Water	mBq	755.194	755.124	0.070
Antimony-125	Water	mBq	13.138	13.075	0.063
AOX, Adsorbable Organic Halogen as Cl	Water	mg	23.540	23.533	0.006
Arsenic	Water	mg	119.951	55.757	64.194
Atrazine	Water	pg	114.130	114.130	0.000
Barium	Water	g	2.187	2.181	0.006
Barium-140	Water	µBq	564.828	563.812	1.016
Bentazone	Water	pg	0.628	0.628	0.000
Benzene	Water	mg	851.754	851.151	0.603
Benzene, 1,2-dichloro-	Water	mg	64.603	64.603	0.000
Benzene, chloro-	Water	mg	600.495	600.495	0.000
Benzene, ethyl-	Water	mg	60.244	60.084	0.159

Benzo(a)anthracene	Water	pg	279.397	279.397	0.000
Benzo(a)pyrene	Water	pg	33.947	33.947	0.000
Benzo(b)fluoranthene	Water	pg	33.109	33.109	0.000
Benzo(g,h,i)perylene	Water	pg	4.659	4.659	0.000
Benzo(k)fluoranthene	Water	pg	15.576	15.576	0.000
Beryllium	Water	µg	13.476	13.410	0.066
BOD5, Biological Oxygen Demand	Water	g	584.493	578.142	6.351
Borate	Water	mg	657.494	657.494	0.000
Boron	Water	mg	178.902	70.819	108.082
Bromate	Water	mg	40.771	24.548	16.223
Bromide	Water	g	29.571	29.571	0.000
Bromine	Water	g	1.814	1.810	0.005
Bromoxynil	Water	pg	15.837	15.837	0.000
Butene	Water	mg	228.484	228.483	0.002
Butyl acetate	Water	µg	292.633	292.566	0.067
Butyrolactone	Water	µg	8.433	8.433	0.000
Cadmium	Water	mg	1.100	1.059	0.041
Calcium	Water	g	92.819	92.246	0.573
Carbaryl	Water	pg	0.043	0.043	0.000
Carbon-14	Water	mBq	82.787	82.787	0.000
Carbon disulfide	Water	mg	17.941	17.941	0.000
Carbonate	Water	mg	83.841	83.711	0.129
Carboxylic acids, unspecified	Water	g	9.237	9.212	0.024
Cerium-141	Water	µBq	247.041	246.635	0.406
Cerium-144	Water	µBq	126.846	126.722	0.124
Cesium	Water	mg	2.510	2.503	0.007
Cesium-134	Water	mBq	7.857	7.803	0.055
Cesium-136	Water	µBq	73.950	73.877	0.072
Cesium-137	Water	mBq	86.279	86.047	0.232
Chloramine	Water	mg	112.819	112.819	0.000
Chlorate	Water	mg	313.084	189.149	123.935
Chloride	Water	kg	1.495	1.380	0.114
Chlorinated solvents, unspecified	Water	µg	664.202	628.625	35.577
Chlorine	Water	µg	842.722	832.871	9.851
Chloroacetic acid	Water	µg	266.462	266.420	0.042
Chloroacetyl chloride	Water	µg	1.238	1.238	0.000
Chloroform	Water	ng	767.838	766.618	1.219
Chlorosulfonic acid	Water	ng	752.428	752.263	0.165
Chromium	Water	mg	6.093	5.390	0.703
Chromium-51	Water	mBq	42.992	42.890	0.102
Chromium VI	Water	mg	262.745	254.598	8.147
Chrysene	Water	pg	180.211	180.211	0.000
Cobalt	Water	mg	1.522	1.514	0.008
Cobalt-57	Water	mBq	2.347	2.345	0.002
Cobalt-58	Water	mBq	323.419	322.763	0.656
Cobalt-60	Water	mBq	221.025	220.497	0.528
COD, Chemical Oxygen Demand	Water	g	591.716	581.493	10.223
Copper	Water	mg	9.555	6.600	2.955
Cumene	Water	mg	45.210	45.008	0.202
Cyanide	Water	mg	51.692	51.656	0.035
Dibenz(a,h)anthracene	Water	pg	3.262	3.262	0.000
Dicamba	Water	pg	12.509	12.509	0.000
Dichlorprop	Water	pg	3.496	3.496	0.000
Dichromate	Water	µg	96.855	2.436	94.420
Diethylamine	Water	µg	19.898	19.896	0.003
Dimethenamid	Water	pg	3.776	3.776	0.000

Dimethylamine	Water	µg	15.365	15.362	0.003
Dipropylamine	Water	µg	12.188	12.186	0.002
DOC, Dissolved Organic Carbon	Water	g	177.762	173.728	4.035
Ethane, 1,1,1-trichloro-, HCFC-140	Water	pg	0.299	0.299	0.000
Ethane, 1,2-dichloro-	Water	mg	12.557	12.556	0.001
Ethanol	Water	g	1.553	1.553	0.000
Ethene	Water	mg	16.416	16.336	0.080
Ethene, chloro-	Water	µg	4.726	4.720	0.006
Ethephon	Water	pg	0.000	0.000	0.000
Ethyl acetate	Water	µg	26.535	26.532	0.003
Ethylamine	Water	mg	7.627	7.627	0.000
Ethylene diamine	Water	mg	7.082	7.082	0.000
Ethylene oxide	Water	g	1.465	1.465	0.000
Fluoranthene	Water	µg	1.467	1.467	0.000
Fluorene	Water	ng	540.633	540.633	0.000
Fluoride	Water	mg	850.839	320.759	530.080
Fluosilicic acid	Water	µg	127.456	123.662	3.794
Formaldehyde	Water	mg	5.971	5.971	0.000
Formamide	Water	mg	15.833	15.833	0.000
Formate	Water	µg	178.127	178.095	0.032
Formic acid	Water	mg	4.596	4.596	0.000
Glyphosate	Water	pg	369.873	369.873	0.000
Heat, waste	Water	MMBTU	1.779	0.167	1.612
Hydrocarbons, aliphatic, alkanes, unspecified	Water	mg	326.301	325.438	0.863
Hydrocarbons, aliphatic, unsaturated	Water	mg	30.125	30.045	0.080
Hydrocarbons, aromatic	Water	g	1.318	1.315	0.003
Hydrocarbons, unspecified	Water	mg	29.184	29.068	0.117
Hydrogen-3, Tritium	Water	kBq	35.411	35.235	0.175
Hydrogen peroxide	Water	µg	429.450	429.112	0.338
Hydrogen sulfide	Water	mg	2.096	2.095	0.000
Hydroxide	Water	mg	17.507	17.506	0.001
Hypochlorite	Water	mg	1.358	1.346	0.012
Indeno(1,2,3-cd)pyrene	Water	pg	51.199	51.199	0.000
Iodide	Water	g	2.898	2.897	0.001
Iodine-131	Water	mBq	147.520	147.507	0.013
Iodine-133	Water	µBq	404.728	404.090	0.638
Iron	Water	mg	549.830	524.721	25.109
Iron-59	Water	mBq	675.293	675.293	0.000
Isopropylamine	Water	µg	1.409	1.409	0.000
Lactic acid	Water	µg	9.547	9.546	0.001
Lambda-cyhalothrin	Water	pg	0.000	0.000	0.000
Lanthanum-140	Water	µBq	661.252	660.170	1.082
Lead	Water	mg	15.437	15.060	0.376
Lead-210	Water	Bq	6.680	6.651	0.029
Lithium	Water	mg	302.022	302.022	0.000
m-Xylene	Water	mg	12.796	12.796	0.000
Magnesium	Water	g	15.599	15.329	0.269
Manganese	Water	mg	329.848	327.723	2.125
Manganese-54	Water	mBq	12.774	12.734	0.040
MCPB	Water	ng	2.526	2.526	0.000
Mercury	Water	mg	1.307	0.178	1.129
Methane, dichloro-, HCC-30	Water	mg	14.755	14.752	0.002
Methanol	Water	mg	45.003	45.003	0.000
Methomyl	Water	pg	0.000	0.000	0.000
Methyl acetate	Water	ng	323.621	323.546	0.075
Methyl acrylate	Water	ng	912.879	736.651	176.228

Methyl formate	Water	µg	696.376	696.376	0.000
Methylamine	Water	µg	21.499	21.499	0.000
Metolachlor	Water	pg	18.534	18.534	0.000
Molybdenum	Water	mg	87.031	40.436	46.595
Molybdenum-99	Water	µBq	208.138	207.765	0.373
Naphthalene	Water	ng	108.406	108.406	0.000
Nickel	Water	mg	14.925	10.743	4.183
Niobium-95	Water	mBq	1.132	1.127	0.005
Nitrate	Water	g	9.858	5.715	4.144
Nitrite	Water	mg	48.775	48.511	0.265
Nitrobenzene	Water	µg	100.006	99.992	0.014
Nitrogen	Water	mg	894.167	873.596	20.571
Nitrogen, organic bound	Water	mg	370.264	369.502	0.761
Oils, biogenic	Water	µg	8.373	8.373	0.000
Oils, unspecified	Water	g	178.748	178.294	0.455
PAH, polycyclic aromatic hydrocarbons	Water	mg	15.537	15.505	0.032
Paraffins	Water	µg	23.655	23.655	0.000
Pendimethalin	Water	pg	0.697	0.697	0.000
Phenanthrene	Water	µg	1.217	1.217	0.000
Phenol	Water	mg	227.856	227.310	0.546
Phosphate	Water	g	1.015	1.006	0.009
Phosphorus	Water	mg	129.065	128.962	0.103
Polonium-210	Water	Bq	6.680	6.651	0.029
Potassium	Water	g	19.306	15.567	3.738
Potassium-40	Water	Bq	8.386	8.349	0.037
Propanal	Water	mg	12.532	12.532	0.000
Propene	Water	mg	28.161	28.079	0.082
Propiconazole	Water	pg	0.000	0.000	0.000
Propionic acid	Water	µg	11.004	11.004	0.001
Propylamine	Water	mg	5.014	5.014	0.000
Propylene oxide	Water	mg	13.748	13.747	0.001
Protactinium-234	Water	Bq	2.131	2.120	0.012
Prothioconazol	Water	pg	0.000	0.000	0.000
Pyraclostrobin (prop)	Water	pg	3.261	3.261	0.000
Pyrene	Water	µg	1.105	1.105	0.000
Radioactive species, alpha emitters	Water	mBq	37.875	37.775	0.100
Radioactive species, Nuclides, unspecified	Water	Bq	90.654	90.168	0.486
Radium-224	Water	Bq	125.500	125.168	0.332
Radium-226	Water	kBq	1.517	1.509	0.008
Radium-228	Water	Bq	251.001	250.337	0.664
Rubidium	Water	mg	25.100	25.034	0.066
Ruthenium-103	Water	µBq	78.118	78.039	0.079
Scandium	Water	mg	4.990	4.967	0.022
Selenium	Water	mg	4.447	4.426	0.021
Silicon	Water	g	1.432	1.373	0.059
Silicon dioxide	Water	µg	91.646	91.646	0.000
Silver	Water	mg	2.431	2.424	0.007
Silver-110	Water	mBq	161.514	161.011	0.502
Sodium	Water	g	821.229	817.329	3.900
Sodium-24	Water	mBq	2.772	2.769	0.003
Sodium formate	Water	µg	3.671	3.220	0.450
Solids, inorganic	Water	g	1.252	1.112	0.140
Strontium	Water	g	4.532	4.520	0.012
Strontium-89	Water	mBq	3.954	3.945	0.009
Strontium-90	Water	Bq	4.882	4.608	0.275
Sulfate	Water	g	71.731	48.993	22.737

Sulfide	Water	mg	26.044	26.036	0.007
Sulfite	Water	mg	21.154	21.029	0.125
Sulfur	Water	mg	689.955	688.729	1.225
Suspended solids, unspecified	Water	g	30.269	30.246	0.023
t-Butyl methyl ether	Water	mg	6.602	6.602	0.000
t-Butylamine	Water	µg	1.387	1.387	0.000
Tebuconazole	Water	pg	0.000	0.000	0.000
Technetium-99m	Water	mBq	5.105	5.096	0.009
Tefluthrin	Water	pg	0.000	0.000	0.000
Tellurium-123m	Water	µBq	707.992	700.788	7.204
Tellurium-132	Water	µBq	22.159	22.137	0.022
Thallium	Water	µg	16.745	16.540	0.205
Thorium-228	Water	Bq	502.002	500.673	1.328
Thorium-230	Water	Bq	288.316	286.715	1.601
Thorium-232	Water	Bq	1.563	1.557	0.007
Thorium-234	Water	Bq	2.132	2.121	0.012
Tin	Water	µg	630.518	562.457	68.062
Titanium	Water	mg	4.794	4.577	0.217
TOC, Total Organic Carbon	Water	g	178.248	174.213	4.035
Toluene	Water	mg	316.833	316.065	0.767
Toluene, 2-chloro-	Water	µg	16.317	16.315	0.002
Triethylene glycol	Water	µg	1.666	1.666	0.000
Trifloxystrobin	Water	pg	0.000	0.000	0.000
Trimethylamine	Water	ng	546.912	546.757	0.156
Tungsten	Water	mg	5.528	5.503	0.024
Uranium-234	Water	Bq	2.556	2.542	0.014
Uranium-235	Water	Bq	4.187	4.164	0.023
Uranium-238	Water	Bq	9.673	9.623	0.050
Uranium alpha	Water	Bq	121.838	121.162	0.676
Urea	Water	mg	14.401	14.401	0.000
Vanadium	Water	mg	5.805	5.071	0.734
VOC, volatile organic compounds, unspecified origin	Water	mg	883.770	881.417	2.353
Water, AR	Water	mm3	267.132	267.132	0.000
Water, AT	Water	mm3	657.542	657.542	0.000
Water, BE	Water	cm3	1.374	1.374	0.000
Water, BG	Water	cm3	2.405	2.405	0.000
Water, BR	Water	cm3	21.865	21.865	0.000
Water, CA	Water	cu.in	141.918	141.918	0.000
Water, CH	Water	cm3	38.832	38.832	0.000
Water, CI	Water	mm3	661.005	661.005	0.000
Water, CL	Water	mm3	12.024	12.024	0.000
Water, CN	Water	cm3	252.335	252.335	0.000
Water, CO	Water	mm3	19.576	19.576	0.000
Water, CR	Water	mm3	7.827	7.827	0.000
Water, CZ	Water	mm3	89.098	89.098	0.000
Water, DE	Water	cm3	7.621	7.621	0.000
Water, DK	Water	cm3	1.099	1.099	0.000
Water, EC	Water	mm3	88.711	88.711	0.000
Water, ES	Water	cm3	1.123	1.123	0.000
Water, Europe without Switzerland	Water	mm3	817.589	817.589	0.000
Water, FI	Water	mm3	373.310	373.310	0.000
Water, FR	Water	cm3	2.961	2.961	0.000
Water, GB	Water	cm3	2.669	2.669	0.000
Water, GH	Water	mm3	642.377	642.377	0.000
Water, GLO	Water	cm3	18.077	18.077	0.000
Water, HN	Water	mm3	1.009	1.009	0.000

Water, HU	Water	mm3	375.747	375.747	0.000
Water, IAI Area, Africa	Water	mm3	109.850	109.850	0.000
Water, IAI Area, Asia, without China and GCC	Water	mm3	201.164	201.164	0.000
Water, IAI Area, EU27 & EFTA	Water	cm3	1.686	1.686	0.000
Water, IAI Area, Gulf Cooperation Council	Water	mm3	241.735	241.735	0.000
Water, IAI Area, North America, without Quebec	Water	mm3	157.119	157.119	0.000
Water, IAI Area, Russia & RER w/o EU27 & EFTA	Water	mm3	409.042	409.042	0.000
Water, IAI Area, South America	Water	mm3	152.870	152.870	0.000
Water, ID	Water	mm3	327.986	327.986	0.000
Water, IL	Water	mm3	2.844	2.844	0.000
Water, IN	Water	cm3	730.305	730.305	0.000
Water, IT	Water	cm3	2.912	2.912	0.000
Water, JP	Water	cm3	6.713	6.713	0.000
Water, KR	Water	cm3	438.417	438.417	0.000
Water, LU	Water	mm3	59.563	59.563	0.000
Water, MX	Water	mm3	194.692	194.692	0.000
Water, MY	Water	mm3	126.041	126.041	0.000
Water, NL	Water	cm3	2.698	2.698	0.000
Water, NO	Water	mm3	145.541	145.541	0.000
Water, NZ	Water	mm3	0.061	0.061	0.000
Water, PE	Water	mm3	21.196	21.196	0.000
Water, PH	Water	cm3	1.670	1.670	0.000
Water, PL	Water	mm3	52.637	52.637	0.000
Water, PT	Water	mm3	340.207	340.207	0.000
Water, RER	Water	cm3	14.703	14.703	0.000
Water, RNA	Water	mm3	0.171	0.171	0.000
Water, RO	Water	cm3	326.660	326.660	0.000
Water, RoW	Water	cm3	207.614	207.614	0.000
Water, RU	Water	cm3	117.906	117.906	0.000
Water, SE	Water	cm3	1.897	1.897	0.000
Water, SK	Water	mm3	33.467	33.467	0.000
Water, TR	Water	mm3	75.631	75.631	0.000
Water, TW	Water	cm3	1.767	1.767	0.000
Water, UA	Water	mm3	14.580	14.580	0.000
Water, UN-OCEANIA	Water	mm3	143.902	143.902	0.000
Water, US	Water	cm3	1.595	1.595	0.000
Water, VN	Water	mm3	63.054	63.054	0.000
Water, ZA	Water	mm3	5.782	5.782	0.000
Xylene	Water	mg	237.787	237.158	0.629
Zinc	Water	mg	277.561	275.936	1.626
Zinc-65	Water	mBq	74.349	74.311	0.038
Zirconium-95	Water	mBq	337.963	337.962	0.000
Benzene, chloro-	Water	mg	14.677	14.677	0.000
Chloride	Water	mg	1.007	1.007	0.000
Aluminium	Soil	µg	171.982	171.982	0.000
Antimony	Soil	µg	1.061	1.061	0.000
Arsenic	Soil	µg	2.020	2.020	0.000
Barium	Soil	µg	66.552	66.552	0.000
Boron	Soil	ng	760.281	245.495	514.786
Bromine	Soil	µg	10.609	10.609	0.000
Cadmium	Soil	µg	27.860	27.366	0.494
Calcium	Soil	µg	473.774	473.774	0.000
Carbon	Soil	µg	25.820	25.820	0.000
Carbon dioxide, to soil or biomass stock	Soil	mg	53.104	53.104	0.000
Chloride	Soil	mg	2.036	0.677	1.359
Chlorine	Soil	µg	276.094	276.094	0.000

Chromium	Soil	µg	133.609	131.253	2.356
Chromium VI	Soil	µg	4.293	1.387	2.906
Cobalt	Soil	µg	6.787	6.787	0.000
Copper	Soil	mg	1.792	1.757	0.035
Fluoride	Soil	µg	2.906	0.938	1.967
Heat, waste	Soil	MJ	15.405	15.377	0.028
Hydrocarbons, unspecified	Soil	µg	1.409	1.409	0.000
Iron	Soil	g	1.963	1.882	0.081
Lead	Soil	mg	1.137	1.117	0.020
Lithium	Soil	ng	691.880	691.880	0.000
Manganese	Soil	µg	27.082	27.082	0.000
Molybdenum	Soil	µg	1.489	1.489	0.000
Nickel	Soil	µg	343.630	337.246	6.384
Nitrate	Soil	µg	797.311	797.311	0.000
Oils, biogenic	Soil	µg	6.998	2.844	4.154
Oils, unspecified	Soil	g	1.005	1.003	0.003
Organic carbon	Soil	µg	61.067	61.067	0.000
PAH, polycyclic aromatic hydrocarbons	Soil	µg	2.076	2.076	0.000
Phenol, pentachloro-	Soil	ng	1.510	1.510	0.000
Potassium	Soil	µg	148.919	148.919	0.000
Selenium	Soil	µg	10.609	10.609	0.000
Silicon	Soil	µg	955.456	955.456	0.000
Silver	Soil	ng	53.176	53.176	0.000
Sodium	Soil	µg	354.485	347.278	7.207
Strontium	Soil	µg	7.644	7.644	0.000
Sulfate	Soil	mg	1.331	1.331	0.000
Sulfur	Soil	µg	312.335	312.335	0.000
Titanium	Soil	µg	200.975	200.975	0.000
Vanadium	Soil	ng	531.760	531.760	0.000
Zinc	Soil	mg	75.582	74.186	1.395
2-Methyl-4-chlorophenoxyacetic acid	Soil	µg	1.024	1.024	0.000
2,4-D	Soil	mg	10.559	10.559	0.000
2,4-D amines	Soil	ng	111.169	111.169	0.000
2,4-D ester	Soil	ng	29.894	29.894	0.000
Abamectin	Soil	ng	9.159	9.159	0.000
Acephate	Soil	µg	1.393	1.393	0.000
Acetamide	Soil	ng	282.001	282.001	0.000
Acetamiprid	Soil	ng	436.905	436.905	0.000
Acetochlor	Soil	µg	7.284	7.284	0.000
Acifluorfen	Soil	pg	110.246	110.246	0.000
Aclonifen	Soil	mg	4.586	4.586	0.000
Alachlor	Soil	µg	1.313	1.313	0.000
Aldicarb	Soil	µg	6.639	6.614	0.025
Aldrin	Soil	µg	206.451	206.451	0.000
Alpha-cypermethrin	Soil	ng	5.994	5.994	0.000
Aluminium	Soil	g	2.457	2.456	0.000
Ametryn	Soil	ng	123.142	123.142	0.000
Amidosulfuron	Soil	pg	352.824	352.824	0.000
Anthraquinone	Soil	ng	113.265	113.265	0.000
Antimony	Soil	ng	6.316	6.292	0.024
Arsenic	Soil	µg	796.610	796.546	0.064
Asulam	Soil	ng	21.002	21.002	0.000
Atrazine	Soil	µg	108.661	108.661	0.000
Azinphos-methyl	Soil	ng	268.940	266.522	2.418
Azoxystrobin	Soil	µg	2.903	2.891	0.012
Barium	Soil	µg	35.711	35.607	0.104

Benfluralin	Soil	ng	834.378	834.378	0.000
Benomyl	Soil	µg	56.106	56.105	0.000
Bensulfuron methyl ester	Soil	ng	1.091	1.091	0.000
Bentazone	Soil	mg	2.341	2.341	0.000
Benzene, pentachloronitro-	Soil	µg	2.772	2.747	0.025
Bifenox	Soil	ng	32.367	32.367	0.000
Bifenthrin	Soil	ng	26.540	26.540	0.000
Bitertanol	Soil	ng	11.471	11.471	0.000
Boron	Soil	µg	10.097	10.068	0.029
Boscalid	Soil	ng	255.394	255.394	0.000
Bromacil	Soil	ng	246.284	246.284	0.000
Bromoxynil	Soil	ng	293.761	293.761	0.000
Bromuconazole	Soil	pg	368.475	368.475	0.000
Buprofezin	Soil	ng	8.175	8.175	0.000
Butyric acid, 4-(2,4-dichlorophenoxy)-	Soil	ng	61.987	61.987	0.000
Cadmium	Soil	mg	1.647	1.647	0.000
Calcium	Soil	g	33.042	33.040	0.002
Captan	Soil	µg	23.001	23.001	0.000
Carbaryl	Soil	ng	225.237	224.864	0.373
Carbendazim	Soil	ng	436.896	436.896	0.000
Carbetamide	Soil	µg	476.603	476.603	0.001
Carbofuran	Soil	mg	30.760	30.760	0.000
Carbon	Soil	g	1.967	1.962	0.005
Carfentrazone-ethyl	Soil	ng	1.173	1.173	0.000
Chlorfenvinphos	Soil	ng	51.958	51.958	0.000
Chloridazon	Soil	ng	32.884	32.884	0.000
Chloride	Soil	mg	370.415	370.412	0.003
Chlorimuron-ethyl	Soil	µg	161.739	161.739	0.000
Chlormequat	Soil	ng	440.922	440.922	0.000
Chloropicrin	Soil	µg	6.228	6.228	0.000
Chlorothalonil	Soil	µg	77.205	76.821	0.383
Chlorpyrifos	Soil	µg	523.687	523.687	0.000
Chlorpyrifos methyl	Soil	µg	6.896	6.896	0.000
Chlorsulfuron	Soil	pg	507.970	507.970	0.000
Chlortoluron	Soil	ng	495.334	495.334	0.000
Choline chloride	Soil	ng	70.030	70.030	0.000
Chromium	Soil	mg	22.869	22.867	0.002
Cinidon-ethyl	Soil	pg	427.669	427.669	0.000
Clethodim	Soil	µg	231.180	231.180	0.000
Clodinafop-propargyl	Soil	ng	7.517	7.517	0.000
Clomazone	Soil	ng	52.236	52.236	0.000
Clopyralid	Soil	ng	400.069	400.067	0.002
Cloquintocet-mexyl	Soil	ng	1.816	1.816	0.000
Cloransulam-methyl	Soil	µg	69.433	69.433	0.000
Cobalt	Soil	mg	2.110	2.109	0.000
Copper	Soil	mg	10.578	10.569	0.008
Cycloxydim	Soil	ng	33.593	33.593	0.000
Cyfluthrin	Soil	ng	198.801	197.154	1.647
Cyhalothrin, gamma-	Soil	pg	220.637	220.637	0.000
Cymoxanil	Soil	ng	247.026	245.910	1.116
Cypermethrin	Soil	mg	4.347	4.347	0.000
Cyproconazole	Soil	µg	2.253	2.253	0.000
Cyprodinil	Soil	ng	744.021	744.021	0.000
Deltamethrin	Soil	ng	3.941	3.941	0.000
Desmedipham	Soil	ng	15.510	15.510	0.000
Diazinon	Soil	µg	1.504	1.495	0.009

Dicamba	Soil	ng	382.174	382.174	0.000
Dichlorprop	Soil	ng	33.148	33.148	0.000
Dichlorprop-P	Soil	µg	68.835	68.216	0.619
Diclofop	Soil	ng	178.461	178.461	0.000
Diclofop-methyl	Soil	ng	181.081	181.081	0.000
Dicrotophos	Soil	ng	206.964	206.964	0.000
Difenoconazole	Soil	µg	3.149	3.149	0.000
Diflubenzuron	Soil	µg	7.323	7.323	0.000
Diflufenican	Soil	ng	393.813	393.813	0.000
Diflufenzopyr-sodium	Soil	ng	23.590	23.590	0.000
Dimethachlor	Soil	ng	78.831	78.831	0.000
Dimethenamid	Soil	ng	937.632	937.632	0.000
Dimethoate	Soil	µg	2.754	2.748	0.006
Dimethomorph	Soil	ng	104.876	104.637	0.239
Dipropylthiocarbamic acid S-ethyl ester	Soil	µg	11.021	10.922	0.099
Diquat	Soil	µg	2.264	2.245	0.019
Dithianone	Soil	ng	3.528	3.528	0.000
Diuron	Soil	µg	32.237	32.237	0.000
Endosulfan	Soil	µg	3.125	3.117	0.008
Endothall	Soil	ng	430.739	430.661	0.079
Epoxiconazole	Soil	ng	42.421	42.421	0.000
Esfenvalerate	Soil	ng	150.906	149.551	1.355
Ethalfluralin	Soil	µg	13.723	13.723	0.000
Ethephon	Soil	ng	973.009	973.009	0.000
Ethofumesate	Soil	µg	1.003	1.003	0.000
Ethoprop	Soil	µg	2.553	2.530	0.023
Fenamiphos	Soil	ng	680.680	680.680	0.000
Fenbuconazole	Soil	ng	2.931	2.931	0.000
Fenoxaprop	Soil	µg	138.595	138.595	0.000
Fenoxaprop-P ethyl ester	Soil	ng	13.007	13.007	0.000
Fenoxaprop ethyl ester	Soil	ng	14.872	14.872	0.000
Fenpiclonil	Soil	µg	159.810	159.807	0.004
Fenpropathrin	Soil	pg	583.866	583.866	0.000
Fenpropidin	Soil	ng	412.628	412.628	0.000
Fenpropimorph	Soil	ng	517.399	517.399	0.000
Fentin hydroxide	Soil	ng	441.837	437.865	3.972
Fipronil	Soil	µg	1.272	1.272	0.000
Florasulam	Soil	ng	2.892	2.892	0.000
Fluazifop	Soil	ng	31.437	31.437	0.000
Fluazifop-P-butyl	Soil	µg	46.475	46.475	0.000
Flucarbazone sodium salt	Soil	pg	31.748	31.748	0.000
Fludioxonil	Soil	ng	60.710	60.710	0.000
Flufenacet	Soil	ng	117.661	117.661	0.000
Flumetsulam	Soil	ng	41.303	41.303	0.000
Flumiclorac-pentyl	Soil	pg	32.401	32.401	0.000
Flumioxazin	Soil	µg	80.870	80.870	0.000
Flupyrsulfuron-methyl	Soil	pg	49.288	49.288	0.000
Fluquinconazole	Soil	pg	801.870	801.870	0.000
Fluroxypyr	Soil	ng	27.319	27.319	0.000
Flurtamone	Soil	ng	167.930	167.930	0.000
Flusilazole	Soil	ng	16.225	16.225	0.000
Flutolanil	Soil	ng	502.419	497.902	4.517
Folpet	Soil	ng	108.444	108.444	0.000
Fomesafen	Soil	µg	530.961	530.961	0.000
Foramsulfuron	Soil	ng	4.423	4.423	0.000
Fosetyl-aluminium	Soil	µg	2.376	2.376	0.000

Fungicides, unspecified	Soil	µg	1.463	1.463	0.000
Furathiocarb	Soil	ng	112.083	112.083	0.000
Glufosinate	Soil	µg	1.128	1.126	0.002
Glyphosate	Soil	mg	171.622	171.621	0.000
Halosulfuron-methyl	Soil	pg	310.053	310.053	0.000
Herbicides, unspecified	Soil	ng	390.108	390.108	0.000
Hexaconazole	Soil	ng	533.308	533.308	0.000
Hexazinone	Soil	ng	114.076	114.076	0.000
Hydramethylnon	Soil	ng	2.629	2.629	0.000
Imazamox	Soil	µg	69.434	69.433	0.000
Imazapyr	Soil	pg	589.773	589.773	0.000
Imazaquin	Soil	pg	154.548	154.548	0.000
Imazethapyr	Soil	µg	173.449	173.449	0.000
Imidacloprid	Soil	µg	2.878	2.872	0.007
Indoxacarb	Soil	ng	800.256	800.256	0.000
Insecticides, unspecified	Soil	ng	92.624	92.624	0.000
Iodosulfuron	Soil	pg	53.458	53.458	0.000
Iodosulfuron-methyl-sodium	Soil	pg	30.756	30.756	0.000
Ioxynil	Soil	ng	275.547	275.547	0.000
Iprodione	Soil	µg	11.617	11.609	0.008
Iron	Soil	g	3.077	3.073	0.004
Isoproturon	Soil	µg	1.653	1.653	0.000
Isoxaflutole	Soil	ng	134.864	134.864	0.000
Kaolin	Soil	ng	88.702	88.702	0.000
Kresoxim-methyl	Soil	ng	21.200	21.200	0.000
Lactofen	Soil	pg	155.639	155.639	0.000
Lambda-cyhalothrin	Soil	µg	23.196	23.196	0.000
Lead	Soil	mg	7.917	7.915	0.002
Lenacil	Soil	ng	67.293	67.293	0.000
Linuron	Soil	µg	48.309	48.289	0.020
Magnesium	Soil	g	3.734	3.734	0.000
Malathion	Soil	ng	213.971	213.609	0.362
Maleic hydrazide	Soil	µg	2.793	2.768	0.025
Mancozeb	Soil	µg	105.922	105.464	0.459
Mandipropamid	Soil	pg	77.160	77.160	0.000
Maneb	Soil	ng	65.019	64.434	0.585
Manganese	Soil	g	2.316	2.316	0.000
MCPB	Soil	ng	421.179	421.179	0.000
Mecoprop	Soil	ng	29.001	29.001	0.000
Mecoprop-P	Soil	ng	113.125	113.125	0.000
Mefenpyr	Soil	ng	29.904	29.904	0.000
Mefenpyr-diethyl	Soil	ng	15.614	15.614	0.000
Mepiquat chloride	Soil	ng	138.680	138.680	0.000
Mercury	Soil	µg	16.268	16.227	0.040
Mesosulfuron-methyl (prop)	Soil	pg	169.657	169.657	0.000
Mesotrione	Soil	ng	191.681	191.681	0.000
Metalaxil	Soil	µg	1.445	1.432	0.013
Metalaxyl-M	Soil	µg	35.569	35.569	0.000
Metaldehyde	Soil	µg	2.243	2.243	0.000
Metam-sodium dihydrate	Soil	µg	454.822	450.733	4.089
Metamitron	Soil	µg	3.535	3.535	0.000
Metazachlor	Soil	ng	812.850	812.850	0.000
Metconazole	Soil	ng	9.573	9.573	0.000
Methiocarb	Soil	ng	9.661	9.661	0.000
Methomyl	Soil	pg	0.429	0.429	0.000
Methoxyfenozide	Soil	ng	110.702	110.702	0.000

Metiram	Soil	µg	1.897	1.880	0.017
Metolachlor	Soil	mg	1.495	1.495	0.000
Metosulam	Soil	pg	97.178	97.178	0.000
Metribuzin	Soil	µg	561.909	561.866	0.043
Metsulfuron-methyl	Soil	ng	51.475	51.475	0.000
Mineral oil	Soil	µg	53.296	53.296	0.000
Molinate	Soil	ng	92.912	92.912	0.000
Molybdenum	Soil	µg	443.799	443.658	0.140
Monocrotophos	Soil	ng	887.967	887.967	0.000
Monosodium acid methanearsonate	Soil	ng	105.592	105.592	0.000
Myclobutanil	Soil	ng	101.248	101.248	0.000
Napropamide	Soil	µg	1.495	1.495	0.000
Nickel	Soil	mg	5.442	5.441	0.001
Nicosulfuron	Soil	ng	32.437	32.437	0.000
Norflurazon	Soil	ng	155.126	155.126	0.000
Oils, unspecified	Soil	ng	841.896	841.896	0.000
Orbencarb	Soil	µg	10.103	10.084	0.019
Oryzalin	Soil	ng	153.993	153.993	0.000
Oxamyl	Soil	µg	2.142	2.123	0.019
Oxydemeton methyl	Soil	ng	3.740	3.740	0.000
Oxyfluorfen	Soil	µg	1.513	1.513	0.000
Paraquat	Soil	µg	3.585	3.584	0.001
Parathion	Soil	ng	352.864	352.863	0.001
Parathion, methyl	Soil	pg	124.649	124.649	0.000
Pendimethalin	Soil	mg	4.034	4.034	0.000
Permethrin	Soil	ng	102.033	101.236	0.797
Pesticides, unspecified	Soil	µg	11.926	11.926	0.000
Phenmedipham	Soil	ng	655.972	655.972	0.000
Phorate	Soil	µg	4.616	4.575	0.042
Phosmet	Soil	ng	543.186	538.615	4.570
Phosphorus	Soil	g	1.134	1.134	0.000
Picloram	Soil	pg	63.495	63.495	0.000
Picoxystrobin	Soil	ng	38.580	38.580	0.000
Piperonyl butoxide	Soil	ng	32.843	32.707	0.136
Pirimicarb	Soil	µg	222.048	222.048	0.000
Pirimiphos methyl	Soil	ng	423.367	423.367	0.000
Potassium	Soil	g	6.309	6.309	0.000
Primisulfuron	Soil	ng	14.745	14.745	0.000
Prochloraz	Soil	ng	11.259	11.259	0.000
Procymidone	Soil	ng	12.593	12.593	0.000
Profenofos	Soil	ng	164.317	164.317	0.000
Prohexadione-calcium	Soil	pg	38.259	38.259	0.000
Prometryn	Soil	ng	88.192	88.192	0.000
Pronamide	Soil	pg	290.101	290.101	0.000
Propachlor	Soil	µg	4.155	4.155	0.000
Propamocarb HCl	Soil	ng	22.166	21.966	0.199
Propanil	Soil	ng	240.640	240.640	0.000
Propargite	Soil	µg	1.481	1.467	0.013
Propiconazole	Soil	ng	148.862	148.862	0.000
Propoxycarbazone-sodium (prop)	Soil	pg	212.109	212.109	0.000
Prosulfuron	Soil	ng	6.605	6.605	0.000
Prothioconazol	Soil	ng	37.568	37.568	0.000
Pymetrozine	Soil	ng	141.862	140.587	1.275
Pyraclostrobin (prop)	Soil	µg	1.080	1.080	0.000
Pyrethrin	Soil	ng	19.662	19.662	0.000
Pyrimethanil	Soil	ng	155.723	155.723	0.000

Pyrithiobac sodium salt	Soil	ng	5.902	5.902	0.000
Quinclorac	Soil	ng	4.019	4.019	0.000
Quinoxyfen	Soil	ng	1.855	1.855	0.000
Quizalofop-P	Soil	ng	945.839	945.834	0.005
Quizalofop-p-ethyl	Soil	ng	131.769	131.769	0.000
Quizalofop ethyl ester	Soil	ng	1.650	1.650	0.000
Rimsulfuron	Soil	ng	82.747	82.136	0.611
Rotenone	Soil	ng	11.010	11.010	0.000
Sethoxydim	Soil	µg	4.324	4.323	0.001
Silicon	Soil	g	9.657	9.656	0.001
Silthiofam	Soil	ng	2.851	2.851	0.000
Silver	Soil	pg	0.013	0.013	0.000
Simazine	Soil	ng	968.765	968.765	0.000
Spinosad	Soil	ng	13.075	13.049	0.027
Spiroxamine	Soil	ng	52.713	52.713	0.000
Strontium	Soil	µg	130.532	130.154	0.378
Sulfentrazone	Soil	µg	833.200	833.200	0.000
Sulfosate	Soil	mg	3.431	3.431	0.000
Sulfosulfuron	Soil	pg	761.938	761.938	0.000
Sulfur	Soil	g	1.115	1.115	0.000
Sulfuric acid	Soil	µg	520.944	516.261	4.684
Tebuconazole	Soil	ng	145.260	145.260	0.000
Tebupirimphos	Soil	ng	123.858	123.858	0.000
Tebutam	Soil	µg	5.956	5.956	0.000
Teflubenzuron	Soil	ng	124.722	124.490	0.232
Tefluthrin	Soil	ng	98.075	98.075	0.000
Terbacil	Soil	µg	1.527	1.527	0.000
Terbufos	Soil	µg	4.631	4.631	0.000
Thiamethoxam	Soil	µg	2.218	2.217	0.001
Thiazole, 2-(thiocyanatemethylthio)benzo-	Soil	µg	43.043	42.656	0.387
Thidiazuron	Soil	ng	10.339	10.339	0.000
Thifensulfuron-methyl	Soil	pg	606.222	606.222	0.000
Thiobencarb	Soil	ng	51.503	51.503	0.000
Thiodicarb	Soil	pg	39.464	39.464	0.000
Thiram	Soil	µg	99.577	99.577	0.000
Tin	Soil	µg	64.625	64.050	0.575
Titanium	Soil	mg	159.742	159.740	0.001
Tralkoxydim	Soil	ng	266.850	266.850	0.000
Triadimenol	Soil	ng	2.372	2.372	0.000
Triallate	Soil	ng	1.714	1.714	0.000
Triasulfuron	Soil	pg	507.970	507.970	0.000
Tribenuron	Soil	pg	201.536	201.536	0.000
Tribenuron-methyl	Soil	ng	6.746	6.746	0.000
Tribufos	Soil	ng	96.690	96.690	0.000
Trichlorfon	Soil	ng	2.217	2.197	0.020
Triclopyr	Soil	µg	1.852	1.852	0.000
Trifloxystrobin	Soil	ng	22.381	22.381	0.000
Trifluralin	Soil	mg	4.858	4.858	0.000
Triforine	Soil	ng	32.758	32.758	0.000
Trinexapac-ethyl	Soil	ng	234.947	234.947	0.000
Vanadium	Soil	mg	4.572	4.572	0.000
Vinclozolin	Soil	ng	4.198	4.198	0.000
Zeta-cypermethrin	Soil	pg	46.630	46.630	0.000
Zinc	Soil	mg	178.480	178.456	0.024
Oils, biogenic	Soil	mg	166.977	166.967	0.010
Oils, unspecified	Soil	g	220.721	220.158	0.563

Aluminium	Soil	µg	132.947	37.895	95.051
Arsenic	Soil	ng	53.179	15.158	38.021
Barium	Soil	µg	66.473	18.948	47.526
Boron	Soil	µg	1.329	0.379	0.951
Cadmium	Soil	ng	133.006	133.006	0.000
Calcium	Soil	µg	623.070	242.862	380.208
Carbon	Soil	mg	1.527	1.242	0.285
Chloride	Soil	µg	465.316	132.635	332.681
Chromium	Soil	ng	664.734	189.478	475.256
Cobalt	Soil	ng	264.709	264.709	0.000
Copper	Soil	µg	98.319	97.636	0.683
Fluoride	Soil	µg	6.647	1.895	4.753
Glyphosate	Soil	ng	650.575	264.429	386.146
Heat, waste	Soil	kJ	239.235	239.089	0.146
Iron	Soil	µg	265.893	75.791	190.102
Lead	Soil	µg	5.972	5.972	0.000
Magnesium	Soil	µg	106.358	30.317	76.041
Manganese	Soil	µg	5.318	1.516	3.802
Mercury	Soil	ng	26.471	26.471	0.000
Nickel	Soil	µg	1.995	1.995	0.000
Nitrogen	Soil	µg	13.301	13.301	0.000
Oils, biogenic	Soil	µg	1.189	1.189	0.000
Oils, unspecified	Soil	mg	44.583	44.465	0.117
Phosphorus	Soil	µg	12.880	8.128	4.753
Potassium	Soil	µg	46.532	13.264	33.268
Silicon	Soil	µg	13.295	3.790	9.505
Sodium	Soil	µg	265.893	75.791	190.102
Strontium	Soil	µg	1.329	0.379	0.951
Sulfur	Soil	µg	86.407	29.375	57.032
Zinc	Soil	µg	15.295	13.869	1.426