



June 01, 2018

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Environmental Sustainability - COE
Merck & Co., Inc., Kenilworth, NJ, USA

Subject: 2017 Greenhouse Gas and Water Inventories Limited Verification

WSP has conducted an independent third party review of the 2017 greenhouse gas and water inventories of Merck & Co., Inc., Kenilworth, NJ, USA (the “company”) with the intention of providing limited assurance of their accuracy and completeness. For the greenhouse gas inventory, the scope of the review includes all Scope 1 and Scope 2 emission sources, and select Scope 3 emissions, including business travel, the usage of sold products, and upstream fuel- and energy-related emissions not included in Scopes 1 and 2. For the water inventory, the scope of the review includes global water withdrawals from municipal, groundwater, and surface sources, as well as water discharges. The Scope 1 and 2 GHG and water inventories apply to all owned and leased facilities under the company’s operational control.

WSP provided a “Review Findings” report to the company which lists in detail the specific review tasks completed and areas which have been flagged for clarification or improvement. The company has addressed all requests for clarification and has completed all necessary corrective actions. The details of the scope of this assurance review can be found in Table 1.

TABLE 1: ASSURANCE SCOPE

ASSURANCE PARAMETER	SPECIFICATION
GHG Calculation and Reporting Protocol	<ul style="list-style-type: none">▪ The Greenhouse Gas Protocol: <i>A Corporate Accounting and Reporting Standard (Revised Edition)</i>▪ The Greenhouse Gas Protocol: <i>Corporate Value Chain (Scope 3) Accounting and Reporting Standard</i>
Verification Standard	ISO 14064-3
Level of Assurance	Limited
Organizational Boundary	Operational control
Geography	Global operations
Inventory Period and Emissions Covered	January 1, 2017 to December 31, 2017



TABLE 2: GREENHOUSE GAS

METRIC	2017 VALUE	2016 VALUE	YEAR-ON-YEAR CHANGE	YEAR-ON-YEAR CHANGE (%)
Scope 1 (all sources, metric tons CO ₂ e)	801,600	860,700	-59,100	-6.9%
Scope 2 Location (all sources, metric tons CO ₂ e)	450,800	501,200	-50,400	-10.1%
Scope 2 Market (all sources, metric tons CO ₂ e)	462,500	537,500	-75,000	-14.0%
Scope 3 (2017 values)	<ul style="list-style-type: none"> ▪ <u>Category 3</u>: Upstream Fuel- and Energy-Related Emissions: 262,100 metric tons CO₂e ▪ <u>Category 6</u>: Business Travel: 218,200 metric tons CO₂e¹ ▪ <u>Category 11</u>: Usage of Sold Products: 205,800 metric tons CO₂e² 			
Supporting Documents Reviewed	<ul style="list-style-type: none"> ▪ Inventory Management Plan (IMP) ▪ Environmental Data Collection Verification Audit Protocol ▪ Select energy invoice records and plant invoice tracking sheets ▪ Environmental database activity data and GHG emissions exports ▪ Emission factors worksheets and database exports ▪ REC and on-site generation worksheets and exports ▪ Active site lists ▪ Interviews with select GHG management and plant personnel ▪ Site-specific energy use and refrigerant tracking worksheets ▪ Site-specific emission factor calculations ▪ Business travel activity data – air, rail, rental car, and hotel stay emissions calculations ▪ Calculation of employee reimbursable mileage emissions ▪ Calculation of upstream fuel- and energy-related activities ▪ Calculations of emissions from sold products 			
Date Review Complete	May 21 st , 2018			

¹ Business travel emissions include air travel, rail travel, rental cars, reimbursed mileage, and hotel stays. Additional sources such as reimbursed meals are not included.

² Usage of sold products includes emissions from Dulera, Zenhale, and Asmanex HFA inhalers sold or given as samples worldwide; Proventil inhalers sold or given as samples in the US and Puerto Rico; and Engemycin, Neo, and Oxytetrin spray sold or given as samples worldwide.



TABLE 3: WATER

WATER

Global Water Withdrawals	19,495,900 m ³
Municipal Water	6,571,500 m ³
Pumped Water	12,924,400 m ³
Global Water Discharge ³	16,642,300 m ³
Supporting Documents Reviewed	<ul style="list-style-type: none">▪ Inventory Calculation Methodology Document▪ Environmental database output worksheets for water reporting and water balance▪ Plant interviews and site-specific water tracking worksheets▪ Water purchasing invoice records▪ Site-specific water balance calculations
Date Review Complete	May 30 th , 2018

ASSURANCE FINDING

Based on these review processes and procedures, WSP has no evidence that the company’s 2017 GHG and water inventories are not materially correct, are not a fair representation of the corresponding data and information, or have not been prepared in accordance with the Greenhouse Gas Protocol.

PROFESSIONAL CONDUCT

WSP has conducted this limited assurance review in its capacity as an independent third party in accordance with the ISO 14065 International Standard, *Greenhouse gases – Requirements for greenhouse gas validation and verification bodies for use in accreditation or other forms of recognition*. ISO 14065 specifies the principles and requirements employed by WSP to make this assertion. WSP has not contributed to the compilation of the company’s 2017 GHG or water inventory and members of the Assurance Team are not working with the company’s 2017 GHG or water inventory beyond what is required of this assignment.

Sincerely,

Katrina Prutzman
Senior Consultant

Jeffrey Irvine
Lead Reviewer

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Senior Consultant

³ Water discharge at some sites includes stormwater runoff that is passed through to the discharge meter on the property.