EXTRACTIVES & MINERALS PROCESSING SECTOR

OIL & GAS – REFINING & MARKETING

Sustainability Accounting Standard

Sustainable Industry Classification System® (SICS®) EM-RM

Prepared by the
Sustainability Accounting Standards Board

October 2018

INDUSTRY STANDARD | VERSION 2018-10
About SASB

The SASB Foundation was founded in 2011 as a not-for-profit, independent standards-setting organization. The SASB Foundation’s mission is to establish and maintain industry-specific standards that assist companies in disclosing financially material, decision-useful sustainability information to investors.

The SASB Foundation operates in a governance structure similar to the structure adopted by other internationally recognized bodies that set standards for disclosure to investors, including the Financial Accounting Standards Board (FASB) and the International Accounting Standards Board (IASB). This structure includes a board of directors (“the Foundation Board”) and a standards-setting board (“the Standards Board” or “the SASB”). The Standards Board develops, issues, and maintains the SASB standards. The Foundation Board oversees the strategy, finances and operations of the entire organization, and appoints the members of the Standards Board.

The Foundation Board is not involved in setting standards, but is responsible for overseeing the Standards Board’s compliance with the organization’s due process requirements. As set out in the SASB Rules of Procedure, the SASB’s standards-setting activities are transparent and follow careful due process, including extensive consultation with companies, investors, and relevant experts.

The SASB Foundation is funded by a range of sources, including contributions from philanthropies, companies, and individuals, as well as through the sale and licensing of publications, educational materials, and other products. The SASB Foundation receives no government financing and is not affiliated with any governmental body, the FASB, the IASB, or any other financial accounting standards-setting body.

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Purpose of SASB Standards

The SASB’s use of the term “sustainability” refers to corporate activities that maintain or enhance the ability of the company to create value over the long term. Sustainability accounting reflects the governance and management of a company’s environmental and social impacts arising from production of goods and services, as well as its governance and management of the environmental and social capitals necessary to create long-term value. The SASB also refers to sustainability as “ESG” (environmental, social, and governance), though traditional corporate governance issues such as board composition are not included within the scope of the SASB’s standards-setting activities.

SASB standards are designed to identify a minimum set of sustainability issues most likely to impact the operating performance or financial condition of the typical company in an industry, regardless of location. SASB standards are designed to enable communications on corporate performance on industry-level sustainability issues in a cost-effective and decision-useful manner using existing disclosure and reporting mechanisms.

Businesses can use the SASB standards to better identify, manage, and communicate to investors sustainability information that is financially material. Use of the standards can benefit businesses by improving transparency, risk management, and performance. SASB standards can help investors by encouraging reporting that is comparable, consistent, and financially material, thereby enabling investors to make better investment and voting decisions.

Overview of SASB Standards

The SASB has developed a set of 77 industry-specific sustainability accounting standards (“SASB standards” or “industry standards”), categorized pursuant to SASB’s Sustainable Industry Classification System® (SICS®). Each SASB standard describes the industry that is the subject of the standard, including any assumptions about the predominant business model and industry segments that are included. SASB standards include:

1. **Disclosure topics** – A minimum set of industry-specific disclosure topics reasonably likely to constitute material information, and a brief description of how management or mismanagement of each topic may affect value creation.

2. **Accounting metrics** – A set of quantitative and/or qualitative accounting metrics intended to measure performance on each topic.

3. **Technical protocols** – Each accounting metric is accompanied by a technical protocol that provides guidance on definitions, scope, implementation, compilation, and presentation, all of which are intended to constitute suitable criteria for third-party assurance.

4. **Activity metrics** – A set of metrics that quantify the scale of a company’s business and are intended for use in conjunction with accounting metrics to normalize data and facilitate comparison.
Furthermore, the *SASB Standards Application Guidance* establishes guidance applicable to the use of all industry standards and is considered part of the standards. Unless otherwise specified in the technical protocols contained in the industry standards, the guidance in the SASB Standards Application Guidance applies to the definitions, scope, implementation, compilation, and presentation of the metrics in the industry standards.

The *SASB Conceptual Framework* sets out the basic concepts, principles, definitions, and objectives that guide the Standards Board in its approach to setting standards for sustainability accounting. The *SASB Rules of Procedure* is focused on the governance processes and practices for standards setting.

**Use of the Standards**

SASB standards are intended for use in communications to investors regarding sustainability issues that are likely to impact corporate ability to create value over the long term. Use of SASB standards is voluntary. A company determines which standard(s) is relevant to the company, which disclosure topics are financially material to its business, and which associated metrics to report, taking relevant legal requirements into account. In general, a company would use the SASB standard specific to its primary industry as identified in SICS®. However, companies with substantial business in multiple SICS® industries can consider reporting on these additional SASB industry standards.

It is up to a company to determine the means by which it reports SASB information to investors. One benefit of using SASB standards may be achieving regulatory compliance in some markets. Other investor communications using SASB information could be sustainability reports, integrated reports, websites, or annual reports to shareholders. There is no guarantee that SASB standards address all financially material sustainability risks or opportunities unique to a company’s business model.

**Industry Description**

Oil & Gas - Refining & Marketing (R&M) companies refine petroleum products, market oil and gas products, and/or operate gas stations and convenience stores, all of which comprise the downstream operations of the oil and gas value chain. The types of refinery products and crude oil inputs influence the complexity of the refining process used, with different expenditure needs and intensity of environmental and social impacts.

Note: The standards discussed below are for “pure-play” R&M activities, or independent R&M companies. Integrated oil and gas companies conduct upstream operations and are also involved in the distribution and/or refining or marketing of products. SASB has separate standards for the Oil and Gas Exploration & Production (EM-EP), and Midstream (EM-MD) industries. As such, integrated companies should also consider the disclosure topics and metrics from these standards.

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1 Legal Note: SASB standards are not intended to, and indeed cannot, replace any legal or regulatory requirements that may be applicable to a reporting entity’s operations.
### Table 1. Sustainability Disclosure Topics & Accounting Metrics

<table>
<thead>
<tr>
<th>TOPIC</th>
<th>ACCOUNTING METRIC</th>
<th>CATEGORY</th>
<th>UNIT OF MEASURE</th>
<th>CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Greenhouse Gas Emissions</strong></td>
<td>Gross global Scope 1 emissions, percentage covered under emissions-limiting regulations</td>
<td>Quantitative</td>
<td>Metric tons (t), CO₂-e, Percentage (%)</td>
<td>EM-RM-110a.1</td>
</tr>
<tr>
<td></td>
<td>Discussion of long-term and short-term strategy or plan to manage Scope 1 emissions, emissions reduction targets, and an analysis of performance against those targets</td>
<td>Discussion and Analysis</td>
<td>n/a</td>
<td>EM-RM-110a.2</td>
</tr>
<tr>
<td><strong>Air Quality</strong></td>
<td>Air emissions of the following pollutants: (1) NO, (excluding N₂O), (2) SO₂, (3) particulate matter (PM₁₀), (4) H₂S, and (5) volatile organic compounds (VOCs)</td>
<td>Quantitative</td>
<td>Metric tons (t)</td>
<td>EM-RM-120a.1</td>
</tr>
<tr>
<td></td>
<td>Number of refineries in or near areas of dense population</td>
<td>Quantitative</td>
<td>Number</td>
<td>EM-RM-120a.2</td>
</tr>
<tr>
<td><strong>Water Management</strong></td>
<td>(1) Total fresh water withdrawn, (2) percentage recycled, (3) percentage in regions with High or Extremely High Baseline Water Stress</td>
<td>Quantitative</td>
<td>Thousand cubic meters (m³), Percentage (%)</td>
<td>EM-RM-140a.1</td>
</tr>
<tr>
<td></td>
<td>Number of incidents of non-compliance associated with water quality permits, standards, and regulations</td>
<td>Quantitative</td>
<td>Number</td>
<td>EM-RM-140a.2</td>
</tr>
<tr>
<td><strong>Hazardous Materials Management</strong></td>
<td>Amount of hazardous waste generated, percentage recycled²</td>
<td>Quantitative</td>
<td>Metric tons (t), Percentage (%)</td>
<td>EM-RM-150a.1</td>
</tr>
<tr>
<td></td>
<td>(1) Number of underground storage tanks (USTs), (2) number of UST releases requiring cleanup, and (3) percentage in states with UST financial assurance funds</td>
<td>Quantitative</td>
<td>Number, Percentage (%)</td>
<td>EM-RM-150a.2</td>
</tr>
<tr>
<td><strong>Workforce Health &amp; Safety</strong></td>
<td>(1) Total recordable incident rate (TRIR), (2) fatality rate, and (3) near miss frequency rate (NMFR) for (a) full-time employees and (b) contract employees</td>
<td>Quantitative</td>
<td>Rate</td>
<td>EM-RM-320a.1</td>
</tr>
<tr>
<td></td>
<td>Discussion of management systems used to integrate a culture of safety</td>
<td>Discussion and Analysis</td>
<td>n/a</td>
<td>EM-RM-320a.2</td>
</tr>
<tr>
<td><strong>Product Specifications &amp; Clean Fuel Blends</strong></td>
<td>Percentage of Renewable Volume Obligation (RVO) met through: (1) production of renewable fuels, (2) purchase of “separated” renewable identification numbers (RIN)</td>
<td>Quantitative</td>
<td>Percentage (%)</td>
<td>EM-RM-410a.1</td>
</tr>
<tr>
<td></td>
<td>Total addressable market and share of market for advanced biofuels and associated infrastructure</td>
<td>Quantitative</td>
<td>Reporting currency, Percentage (%)</td>
<td>EM-RM-410a.2</td>
</tr>
</tbody>
</table>

² Note to EM-RM-150a.1 – The entity shall disclose the legal or regulatory framework(s) used to define hazardous waste and recycled hazardous waste, and the amounts of waste defined in accordance with each applicable framework.
<table>
<thead>
<tr>
<th>TOPIC</th>
<th>ACCOUNTING METRIC</th>
<th>CATEGORY</th>
<th>UNIT OF MEASURE</th>
<th>CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pricing Integrity &amp; Transparency</td>
<td>Total amount of monetary losses as a result of legal proceedings associated with price fixing or price manipulation&lt;sup&gt;3&lt;/sup&gt;</td>
<td>Quantitative</td>
<td>Reporting currency</td>
<td>EM-RM-520a.1</td>
</tr>
<tr>
<td>Management of the Legal &amp; Regulatory Environment</td>
<td>Discussion of corporate positions related to government regulations and/or policy proposals that address environmental and social factors affecting the industry</td>
<td>Discussion and Analysis</td>
<td>n/a</td>
<td>EM-RM-530a.1</td>
</tr>
<tr>
<td>Critical Incident Risk Management</td>
<td>Process Safety Event (PSE) rates for Loss of Primary Containment (LOPC) of greater consequence (Tier 1) and lesser consequence (Tier 2)</td>
<td>Quantitative</td>
<td>Rate</td>
<td>EM-RM-540a.1</td>
</tr>
<tr>
<td></td>
<td>Challenges to Safety Systems indicator rate (Tier 3)</td>
<td>Quantitative</td>
<td>Rate</td>
<td>EM-RM-540a.2</td>
</tr>
<tr>
<td></td>
<td>Discussion of measurement of Operating Discipline and Management System Performance through Tier 4 Indicators</td>
<td>Discussion and Analysis</td>
<td>n/a</td>
<td>EM-RM-540a.3</td>
</tr>
</tbody>
</table>

Table 2. Activity Metrics

<table>
<thead>
<tr>
<th>ACTIVITY METRIC</th>
<th>CATEGORY</th>
<th>UNIT OF MEASURE</th>
<th>CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refining throughput of crude oil and other feedstocks&lt;sup&gt;4&lt;/sup&gt;</td>
<td>Quantitative</td>
<td>Barrels of oil equivalent (BOE)</td>
<td>EM-RM-000.A</td>
</tr>
<tr>
<td>Refining operating capacity&lt;sup&gt;5&lt;/sup&gt;</td>
<td>Quantitative</td>
<td>Million barrels per calendar day (MBPD)</td>
<td>EM-RM-000.B</td>
</tr>
</tbody>
</table>

<sup>3</sup> Note to EM-RM-520a.1 – The entity shall briefly describe the nature, context, and any corrective actions taken as a result of the monetary losses.

<sup>4</sup> Note to EM-RM-000.A – The total volume of crude oil and other feedstocks processed in the refinery system during the reporting period.

<sup>5</sup> Note to EM-RM-000.B – Per the U.S. Energy Information Administration, operating (or operable) capacity is: the amount of capacity that, at the beginning of the period, is in operation; not in operation and not under active repair, but capable of being placed in operation within 30 days; or not in operation but under active repair that can be completed within 90 days. Operable capacity is the sum of the operating and idle capacity and is measured in barrels per calendar day.
Greenhouse Gas Emissions

**Topic Summary**

Oil and Gas R&M operations generate significant direct greenhouse gas (GHG) emissions, from a variety of sources. Emissions primarily consist of carbon dioxide and methane from the stationary combustion of fossil fuels for energy consumption. Energy costs are a significant share of refinery operating costs. Greenhouse gases are also released from process emissions, fugitive emissions resulting from leaks, emissions from venting and flaring, and from non-routine events such as equipment maintenance. The energy intensity of production, and therefore the GHG emissions intensity, can vary significantly depending on the type of crude oil feedstock used and refined product specifications. Companies that cost-effectively reduce GHG emissions from their operations can create operational efficiencies. Such reduction can also mitigate the impact on value of increased fuel costs from regulations that seek to limit—or put a price on—GHG emissions.

**Accounting Metrics**

**EM-RM-110a.1. Gross global Scope 1 emissions, percentage covered under emissions-limiting regulations**

1. The entity shall disclose its gross global Scope 1 greenhouse gas (GHG) emissions to the atmosphere of the seven GHGs covered under the Kyoto Protocol—carbon dioxide (CO$_2$), methane (CH$_4$), nitrous oxide (N$_2$O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF$_6$), and nitrogen trifluoride (NF$_3$).

1.1 Emissions of all GHGs shall be consolidated and disclosed in metric tons of carbon dioxide equivalents (CO$_2$-e), calculated in accordance with published 100-year time horizon global warming potential (GWP) values. To date, the preferred source for GWP factors is the *Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report (2014).*

1.2 Gross emissions are GHGs emitted into the atmosphere before accounting for offsets, credits, or other similar mechanisms that have reduced or compensated for emissions.


2.1 These emissions include direct emissions of GHGs from stationary or mobile sources; these sources include but are not limited to: equipment at well sites, production facilities, refineries, chemical plants, terminals, fixed site drilling rigs, office buildings, marine vessels transporting products, tank truck fleets, mobile drilling rigs, and moveable equipment at drilling and production facilities.
Acceptable calculation methodologies include those that conform to the GHG Protocol as the base reference, but provide additional guidance, such as industry- or region-specific guidance. Examples include, but are not limited to:

2.2.1 *GHG Reporting Guidance for the Aerospace Industry* published by International Aerospace Environmental Group (IAEG)

2.2.2 Greenhouse Gas Inventory Guidance: Direct Emissions from Stationary Combustion Sources published by the U.S. Environmental Protection Agency (EPA)

2.2.3 India GHG Inventory Program

2.2.4 ISO 14064-1

2.2.5 Petroleum Industry Guidelines for reporting GHG emissions, 2nd edition, 2011, published by IPIECA

2.2.6 *Protocol for the quantification of greenhouse gas emissions from waste management activities* published by Entreprises pour l’Environnement (EpE)

2.3 GHG emissions data shall be consolidated according to the approach with which the entity consolidates its financial reporting data, which is generally aligned with the “financial control” approach defined by the GHG Protocol as well as:


2.3.2 The approach provided by the Climate Disclosure Standards Board (CDSB) that is described in REQ-07, “Organisational boundary,” of the *CDSB Framework for reporting environmental information, natural capital and associated business impacts* (April 2018)

3 The entity shall disclose the percentage of its gross global Scope 1 GHG emissions that are covered under an emissions-limiting regulation or program that is intended to directly limit or reduce emissions, such as cap-and-trade schemes, carbon tax/fee systems, and other emissions control (e.g., command-and-control approach) and permit-based mechanisms.

3.1 Examples of emissions-limiting regulations include, but are not limited to:

3.1.1 California Cap-and-Trade (California Global Warming Solutions Act)

3.1.2 European Union Emissions Trading Scheme (EU ETS)

3.1.3 Quebec Cap-and-Trade (Draft Bill 42 of 2009)
3.2 The percentage shall be calculated as the total amount of gross global Scope 1 GHG emissions (CO$_2$-e) that are covered under emissions-limiting regulations divided by the total amount of gross global Scope 1 GHG emissions (CO$_2$-e).

3.2.1 For emissions that are subject to multiple emissions-limiting regulations, the entity shall not account for those emissions more than once.

3.3 The scope of emissions-limiting regulations excludes emissions covered under voluntary emissions-limiting regulations (e.g., voluntary trading systems), as well as disclosure-based regulations [e.g., the U.S. Environmental Protection Agency (EPA) GHG Reporting Program].

4 The entity may discuss any change in its emissions from the previous reporting period, including whether the change was due to emissions reductions, divestment, acquisition, mergers, changes in output, and/or changes in calculation methodology.

5 In the case that current reporting of GHG emissions to the CDP or other entity (e.g., a national regulatory disclosure program) differs in terms of the scope and consolidation approach used, the entity may disclose those emissions. However, primary disclosure shall be according to the guidelines described above.

6 The entity may discuss the calculation methodology for its emissions disclosure, such as if data are from continuous emissions monitoring systems (CEMS), engineering calculations, or mass balance calculations.

EM-RM-110a.2. Discussion of long-term and short-term strategy or plan to manage Scope 1 emissions, emissions reduction targets, and an analysis of performance against those targets

1 The entity shall discuss its long-term and short-term strategy or plan to manage its Scope 1 greenhouse gas (GHG) emissions.


1.2 The scope of GHG emissions includes the seven GHGs covered under the Kyoto Protocol—carbon dioxide (CO$_2$), methane (CH$_4$), nitrous oxide (N$_2$O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF$_6$), and nitrogen trifluoride (NF$_3$).

2 The entity shall discuss its emission reduction target(s) and analyze its performance against the target(s), including the following, where relevant:

2.1 The scope of the emission reduction target (e.g., the percentage of total emissions to which the target is applicable);
2.2 Whether the target is absolute or intensity-based, and the metric denominator, if it is an intensity-based target;

2.3 The percentage reduction against the base year, with the base year representing the first year against which emissions are evaluated towards the achievement of the target;

2.4 The timelines for the reduction activity, including the start year, the target year, and the base year;

2.5 The mechanism(s) for achieving the target; and

2.6 Any circumstances in which the target or base year emissions have been, or may be, recalcinated retrospectively or the target or base year has been reset which may include, but are not limited to energy efficiency efforts, energy source diversification, carbon capture and storage, or the implementation of leak detection and repair processes.

3 The entity shall discuss activities and investments required to achieve the plans and/or targets, and any risks or limiting factors that might affect achievement of the plans and/or targets.

4 The entity shall discuss the scope of its strategies, plans, and/or reduction targets, such as whether they pertain differently to different business units, geographies, or emissions sources.

4.1 Categories of emissions sources generally correspond to those defined in the API Compendium of Greenhouse Gas Emissions Methodologies for the Oil and Natural Gas Industry (2009), and may include:

4.1.1 Flared hydrocarbons, including all emissions emitted from flares and which are associated with the management and disposal of unrecoverable natural gas via combustion of hydrocarbon products from routine operations, upsets, or emergencies.

4.1.2 Other combusted emissions, including, but not limited to: (1) emissions from stationary devices, including, but not limited to boilers, heaters, furnaces, reciprocating internal combustion engines and turbines, incinerators, and thermal/catalytic oxidizers, (2) emissions from mobile sources, including, but not limited to barges, ships, railcars, and trucks for material transport; planes/helicopters and other company vehicles for personnel transport; forklifts, all terrain vehicles, construction equipment, and other off-road mobile equipment, and (3) other combusted emissions shall exclude those emissions disclosed as flared hydrocarbons.

4.1.3 Process emissions, including, but not limited to those emissions that are not combusted and are intentional or designed into the process or technology to occur during normal operations and are a result of some form of chemical transformation or processing step. Such emissions include, but are not limited to those from hydrogen plants, amine units, glycol dehydrators, fluid catalytic cracking unit and reformer generation, and flexi-coker coke burn.
4.1.4 Vented emissions, including those emissions that are not combusted and are intentional or designed into the process or technology to occur during normal operations, and which include, but are not limited to: (1) venting from crude oil, condensate, or natural gas product storage tanks, gas-driven pneumatic devices, gas samplers, chemical injection pumps, exploratory drilling, loading/ballasting/transit, and loading racks, (2) venting resulting from maintenance/turn-arounds, including, but not limited to decoking of furnace tubes, well unloading, vessel and gas compressor depressurizing, compressor starts, gas sampling, and pipeline blowdowns, and (3) venting from non-routine activities, including but not limited to pressure relief valves, pressure control valves, fuel supply unloading valves, and emergency shut-down devices.

4.1.5 Fugitive emissions, including those emissions which can be individually found and “fixed” to make emissions “near zero” and which include, but are not limited to emissions from valves, flanges, connectors, pumps, compressor seal leaks, catadyne heaters, and wastewater treatment and surface impoundments.

5 The entity shall discuss whether its strategies, plans, and/or reduction targets are related to, or associated with, emissions limiting and/or emissions reporting-based programs or regulations (e.g., the EU Emissions Trading Scheme, Quebec Cap-and-Trade System, California Cap-and-Trade Program), including regional, national, international or sectoral programs.

6 Disclosure of strategies, plans, and/or reduction targets shall be limited to activities that were ongoing (active) or reached completion during the reporting period.
Air Quality

**Topic Summary**
Non-greenhouse gas (GHG) air emissions from Refining & Marketing (R&M) operations include criteria air pollutants, Volatile Organic Compounds (VOCs), and hazardous air pollutants, which can have significant, localized human health and environmental impacts. Specific emissions of concern include sulfur dioxide, nitrogen oxides, hydrogen sulfide, particulate matter, and VOCs. Releases occur from stationary combustion sources, storage vessels, flares, and equipment leaks, and may also occur as a result of accidents. Human health impacts and financial consequences for R&M companies are likely to be exacerbated the closer a facility is to population centers. Active management of the issue—through technological and process improvements—can allow companies to limit the impact of regulations and benefit from operational efficiencies that could lead to a lower cost structure over time.

**Accounting Metrics**

EM-RM-120a.1. Air emissions of the following pollutants: (1) NO\(_x\) (excluding N\(_2\)O), (2) SO\(_x\), (3) particulate matter (PM\(_{10}\)), (4) H\(_2\)S, and (5) volatile organic compounds (VOCs)

1 The entity shall disclose its emissions of air pollutants, in metric tons per pollutant, that are released into the atmosphere.

1.1 The scope of disclosure includes air pollutants associated with the entity's direct air emissions resulting from all of the entity's activities and sources of emissions, including, but not limited to, stationary and mobile sources, production facilities, office buildings, and transportation fleets.

2 The entity shall disclose emissions consistent with IPIECA's Oil and Gas Industry Guidance on Voluntary Sustainability Reporting, as noted below.

3 The entity shall disclose its emissions of (1) oxides of nitrogen (NO\(_x\)), reported as NO\(_x\).

3.1 The scope of NO\(_x\) includes NO and NO\(_2\), but excludes N\(_2\)O.

4 The entity shall disclose its emissions of (2) oxides of sulfur (SO\(_x\)), reported as SO\(_x\).

4.1 The scope of SO\(_x\) includes SO\(_2\) and SO\(_3\).

5 The entity shall disclose its emissions of (3) particulate matter 10 micrometers or less in diameter (PM\(_{10}\)), reported as PM\(_{10}\).

5.1 PM\(_{10}\) is defined, according to U.S. 40 CFR Part 51.100, as any airborne finely divided solid or liquid material with an aerodynamic diameter less than or equal to a nominal 10 micrometers.
The entity shall disclose (4) its emissions of hydrogen sulfide (H$_2$S).

The entity shall disclose its emissions of (5) non-methane volatile organic compounds (VOCs).

VOCs are defined as any compound of carbon, excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, ammonium carbonate, and methane, that participates in atmospheric photochemical reactions, except those designated by the U.S. Environmental Protection Agency (EPA) as having negligible photochemical reactivity.

This definition is aligned with U.S. 40 CFR Part 51.100, where a list of compounds that have been determined to have negligible photochemical reactivity can be obtained.

Where applicable regulatory definitions of VOCs may conflict with this definition, such as the EU Paints Directive (Directive 2004/42/EC), and Schedule 1 of the Canadian Environmental Protection Act 1999, the entity may define VOCs as per the applicable regulatory definition.

The entity may discuss the calculation methodology for its emissions disclosure, such as whether data are from continuous emissions monitoring systems (CEMS), engineering calculations, or mass balance calculations.

**EM-RM-120a.2. Number of refineries in or near areas of dense population**

The entity shall disclose the number of its refineries that are located in or near areas of dense population, which are defined as urbanized areas according to U.S. Census Bureau definitions.

Generically, urbanized areas include those with a population greater than 50,000.

A list of urbanized areas is available based on census results, with the list from 2010 accessible here.

The scope of disclosure includes refineries that are located in a census tract or block considered to be in an urbanized area or are within 49 kilometers of an urbanized area.

For refineries located outside of the U.S., the entity shall use available census data to determine whether the refinery is located in an urbanized area, as defined by the U.S. Census Bureau.

In the absence of available or accurate census data, the entity may use international population density data available from in the Columbia University/NASA Socioeconomic Data and Applications Center’s (SEDAC) Gridded Population of the World (GPW), v3.

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7 The 49 km radius is based on definition of “exposed population” from the U.S. EPA’s Office of Pollution Prevention and Toxics, User’s Manual for RSEI Version 2.3.2., July 2013: “The exposed population is the population that is likely to come in contact with a chemical. The population differs depending on the exposure pathway modeled. For instance, the population exposed to chemicals released to air is the population in a circle with a radius of 49 km surrounding the facility.”
Water Management

**Topic Summary**

Refineries can use relatively large quantities of water depending on their size and the complexity of the refining process. This exposes them to the risk of reduced water availability, depending on their location, and related costs. Extraction of water from water-stressed regions or water contamination may also create tensions with local communities. Refinery operations often require wastewater treatment and disposal, often via on-site wastewater treatment plants before discharge. Reducing water use and contamination through recycling and other water management strategies may result in operational efficiencies for companies and lower their operating costs. They could also minimize the impacts of regulations, water supply shortages, and community-related disruptions on operations.

**Accounting Metrics**

**EM-RM-140a.1. (1) Total fresh water withdrawn, (2) percentage recycled, (3) percentage in regions with High or Extremely High Baseline Water Stress**

1 The entity shall disclose the amount of water, in thousands of cubic meters, that was withdrawn from freshwater sources:

   1.1 Fresh water may be defined according to the local statutes and regulations where the entity operates. Where there is no regulatory definition, fresh water shall be considered to be water that has less than 1000 parts per million of dissolved solids per the U.S. Geological Survey.

   1.2 Water obtained from a water utility in compliance with U.S. National Primary Drinking Water Regulations can be assumed to meet the definition of fresh water.

2 The entity shall disclose the percentage of water recycled as the volume, in thousands of cubic meters, recycled divided by the volume of water withdrawn.

   2.1 Any volume of water reused multiple times shall be counted as recycled each time it is recycled and reused.

3 The entity shall analyze all of its operations for water risks and identify activities that withdraw and consume water in locations with High (40–80%) or Extremely High (>80%) Baseline Water Stress as classified by the World Resources Institute’s (WRI) Water Risk Atlas tool, Aqueduct.

4 The entity shall disclose its water withdrawn in locations with High or Extremely High Baseline Water Stress as a percentage of the total water withdrawn.

5 The entity shall disclose its water consumed in locations with High or Extremely High Baseline Water Stress as a percentage of the total water consumed.
EM-RM-140a.2. Number of incidents of non-compliance associated with water quality permits, standards, and regulations

1 The entity shall disclose the total number of instances of non-compliance, including violations of a technology-based standard and exceedances of quality-based standards.

2 The scope of disclosure includes incidents governed by national, state, and local statutory permits and regulations, including, but not limited to, the discharge of a hazardous substance, violation of pretreatment requirements, or total maximum daily load (TMDL) exceedances.

2.1 Typical parameters of concern include: hydrocarbons (including oil and grease), chemical oxygen demand (COD)/biochemical oxygen demand (BOD), sulfides, ammonia, phenols, total suspended solids (TSS), and total dissolved solids (TDS).

3 The scope of disclosure shall only include incidents of non-compliance that resulted in a formal enforcement action(s).

3.1 Formal enforcement actions are defined as governmental actions that address a violation or threatened violation of water quality laws, regulations, policies, or orders, and can result in administrative penalty orders, administrative orders, and judicial actions, among others. For example, the U.S. Environmental Protection Agency (EPA) provides guidance on the scope of formal enforcement actions in, Informal and Formal Actions, Summary Guidance and Portrayal on EPA Websites.

4 Violations shall be disclosed, regardless of their measurement methodology or frequency. These include violations for:

4.1 Continuous discharges, limitations, standards, and prohibitions that are generally expressed as maximum daily, weekly average, and monthly averages.

4.2 Non-continuous discharges and limitations that are generally expressed in terms of frequency, total mass, maximum rate of discharge, and mass or concentration of specified pollutants.
Hazardous Materials Management

Topic Summary
As a byproduct of their operations, Refining & Marketing (R&M) companies generate various forms of waste derived from the processing and storage of petroleum products. Many of these substances are hazardous to human health and the environment and may be subject to regulation. Remediation of inactive or decommissioned sites often takes several years to be completed, and companies may accrue liabilities for past operations. Releases of hazardous substances from underground storage tanks (USTs) used by refining facilities and gas stations can affect redevelopment of land for abandoned or closed facilities. Spills and releases during operations can lead to groundwater contamination and other negative impacts. R&M companies that reduce and recycle hazardous waste streams ensure the integrity of their USTs, as well as those that have effective and prompt clean-up and remediation measures in place for normal operations and decommissioned facilities, may enjoy reduced regulatory and litigation risks and associated costs.

Accounting Metrics

**EM-RM-150a.1. Amount of hazardous waste generated, percentage recycled**

1 The entity shall calculate and disclose the total amount of hazardous waste generated, in metric tons.

1.1 Hazardous wastes are defined per the legal or regulatory framework(s) applicable within the jurisdiction(s) where the waste is generated.

2 The entity shall calculate and disclose the percentage of hazardous waste recycled as the total weight of hazardous waste generated that was recycled, divided by the total weight of hazardous waste generated.

2.1 Hazardous waste that is reused, reclaimed, and/or remanufactured shall be considered within the scope of recycled.

2.2 Recycled, reused, reclaimed, and remanufactured hazardous waste is defined per the legal or regulatory framework(s) applicable within the jurisdiction where the waste is generated.

2.3 Materials incinerated, including for energy recovery, shall not be considered within the scope of recycled.

2.3.1 Energy recovery is defined as the use of combustible waste as a means to generate energy through direct incineration, with or without other waste, but with recovery of the heat.

2.3.2 The entity may separately disclose the percentage of hazardous waste generated that was incinerated.

3 The entity may use the U.S. Resources Conservation and Recovery Act (RCRA) or the EU Waste Framework Directive (Directive 2008/98/EC on waste, including its subsequent amendments), for the purposes of defining hazardous
waste and/or recycled hazardous waste for operations located in jurisdictions that lack applicable legal or regulatory definitions.

Note to EM-RM-150a.1

1 The entity shall disclose the legal or regulatory framework(s) used to define hazardous waste and recycled hazardous waste, and the amounts defined in accordance with each applicable framework.

1.1 For example, if the entity's operations fall under the jurisdiction of the EU Waste Framework Directive (Directive 2008/98/EC on waste, including its subsequent amendments), and therefore, the Waste Framework Directive was used to define all hazardous waste and recycled hazardous waste, the entity shall specify this in its disclosures of the amount of hazardous waste generated and the percentage recycled.

EM-RM-150a.2. (1) Number of underground storage tanks (USTs), (2) number of UST releases requiring cleanup, and (3) percentage in states with UST financial assurance funds

1 The entity shall disclose (1) the number of underground storage tank systems (USTs) for petroleum and hazardous substances.

1.1 The scope of disclosure includes, at a minimum, USTs as defined by 40 CFR §280.12.

1.2 The scope of disclosure includes active USTs and those closed during the reporting period.

2 The entity shall disclose (2) the number of UST releases (including, but not limited to leaks, spills, overfills, and corrosion) for which the entity had some degree of cleanup responsibilities (i.e., including shared cost of remediation).

2.1 The scope of disclosure includes new incidents that occurred during the reporting period as well as past events (e.g., legacy cleanup) for which the entity was notified of responsibility during the reporting period.

2.2 The scope of disclosure includes release from petroleum USTs and hazardous chemical USTs.

3 The entity shall disclose (3) the percentage of UST incidents that occurred in states with UST financial assurance funds.

3.1 The entity shall further indicate any incidents that were legacy events in states that do not provide coverage for past events and any incidents that were not eligible for coverage under the rules of state UST trust funds.

3.2 The entity shall calculate the percentage as the number of UST incidents that occurred in states with UST financial assurance funds divided by the total number of UST incidents that occurred during the reporting period.
The entity may describe its effort to maintain compliance with the Federal Underground Storage Tank Program, including its method/process to prevent UST spills, overfills, and corrosion.
Workforce Health & Safety

Topic Summary
Hazards associated with the operations of companies in the Refining & Marketing (R&M) industry may present risks to employee health and safety. Such hazards include the handling and processing of hydrocarbons, frequently at high temperatures and pressures during refining operations. Accidents or inadvertent exposures to chemicals and other hazards such as heat or noise may result in fatalities, severe injuries, or illnesses. Releases of hydrocarbons or other hazardous substances as a result of accidents or leaks can also have negative consequences for neighboring communities. A company’s ability to protect employee health and safety, and to create a culture of safety and well-being among employees at all levels, can help prevent accidents, mitigate costs and operational downtime, and enhance workforce productivity.

Accounting Metrics

EM-RM-320a.1. (1) Total recordable incident rate (TRIR), (2) fatality rate, and (3) near miss frequency rate (NMFR) for (a) full-time employees and (b) contract employees

1 The entity shall disclose its total recordable incident rate (TRIR) for work-related injuries and illnesses.

1.1 An injury or illness is considered a recordable incident if it results in any of the following: death, days away from work, restricted work or transfer to another job, medical treatment beyond first aid, or loss of consciousness. Additionally, a significant injury or illness diagnosed by a physician or other licensed health care professional is considered a recordable incident, even if it does not result in death, days away from work, restricted work or job transfer, medical treatment beyond first aid, or loss of consciousness. This definition is derived from U.S. 29 CFR 1904.7.

1.2 The U.S. Occupational Safety and Health Administration (OSHA) provides additional resources for determining if injuries or illnesses are considered recordable incidents in its guidance for OSHA Forms 300, 300A, and 301.

2 The entity shall disclose its fatality rate for work-related fatalities.

3 The entity shall disclose its near miss frequency rate (NMFR) for work-related near misses.

3.1 A near miss is defined as an unplanned or uncontrolled event or chain of events that has not resulted in a recordable injury, illness, or physical damage or environmental damage, but had the potential to do so in other circumstances.

3.2 The U.S. National Safety Council (NSC) provides guidance on implementing near miss reporting, including in, “Near Miss Reporting Systems.”
3.3 The entity may disclose its process for classifying, identifying, and reporting near misses.

4 Rates shall be calculated as: \((\text{statistic count} \times 200,000) / \text{hours worked}\)

4.1 The U.S. Bureau of Labor Statistics (BLS) provides additional guidance for the calculation of rates in, “How to Compute a Firm’s Incidence Rate for Safety Management” and “Incidence Rate Calculator and Comparison Tool.”

5 The scope of disclosure includes work-related incidents only.

5.1 OSHA guidance for Forms 300, 300A, and 301 provides guidance on determining whether an incident is work-related, as well as definitions for exemptions for incidents that occur in the work environment but are not work-related.

6 The entity shall disclose the rates by each of the following employee categories:

6.1 Direct, full-time employees, defined as a person legally contracted and paid directly by a company to undertake work associated with its business activities.

6.2 Contract employees, defined as a person not employed directly by the company who performs services under contract for the company, especially at one of its worksites.

7 The scope of disclosure includes all employees regardless of employee location.

EM-RM-320a.2. Discussion of management systems used to integrate a culture of safety

1 The entity shall discuss its management systems used to integrate a culture of safety.

1.1 The scope of discussion shall include how the entity integrates a culture of safety throughout its value chain, such as through technology, training, corporate culture, regulatory compliance, monitoring and testing, and personal protective equipment.

1.2 The scope of discussion may focus broadly on safety management systems, but shall specifically address the systems to maintain a safe working environment, including preventing incidents, fatalities, and illness.

2 The entity shall include a description of how workforce health, safety, and well-being is coordinated among business partners (e.g., contractors and sub-contractors).
Product Specifications & Clean Fuel Blends

Topic Summary

Human health risks and broad environmental risks such as those associated with climate change have raised concerns about the end use of products such as gasoline from the Refining & Marketing (R&M) industry. In response, some regulatory jurisdictions have implemented product specifications and renewable fuel blends, which pose significant compliance and operational risks for R&M companies. Companies may face long-term reductions in revenue from fossil fuel-based products and services due to GHG mitigation policies such as the renewable fuel mandates or standards, as well as competition from non-fossil fuel products. Companies that purchase credits known as renewable identification numbers (RINs) to meet regulatory requirements for renewable fuels in the U.S. can face regulatory and cost risks. In order to ensure regulatory compliance and position themselves for long-term competitiveness, some companies are investing in or purchasing ethanol and other renewable biofuels. Advanced biofuels and fuel technologies have lower lifecycle impacts than traditional biofuels, and can be used to minimize future regulatory risks and public pressure. Although short-term costs to find commercially viable technologies can be significant, investments in R&D for such technologies could serve to advance R&M companies’ long-term profitability.

Accounting Metrics

EM-RM-410a.1. Percentage of Renewable Volume Obligation (RVO) met through: (1) production of renewable fuels, (2) purchase of “separated” renewable identification numbers (RIN)

1 The entity shall disclose the percentage of its Renewable Volume Obligation (RVO) met through the production of renewable fuels, including biofuels, cellulosic biofuel, ethanol, advanced biofuels, and other renewable fuels as defined in U.S. 40 CFR 80.1401.

2 The entity shall disclose the percentage of its RVO met through purchase of “separated” renewable identification numbers (RIN).

2.1 A separated RIN is defined as one that is no longer associated with a physical product and may be traded on an open market.

3 The entity may provide a break down and analysis of its RVO by fuel type: cellulosic biofuels, ethanol equivalent for biomass-based diesel, or advanced biofuels.

EM-RM-410a.2. Total addressable market and share of market for advanced biofuels and associated infrastructure

1 The entity shall provide an estimation of the total addressable market for advanced biofuels and associated infrastructure.
1.1 Total addressable market is defined as potential revenue should the entity capture 100 percent of the market share of the product category (e.g., the global market for advanced biofuels and advanced biofuel infrastructure).

2 The entity shall disclose the share of the total addressable market for advanced biofuels and/or associated infrastructure that it currently captures with its products.

2.1 Market share shall be calculated as revenues from these products divided by the size of the total addressable market.

3 Advanced biofuels are defined according to Section 201 of the Energy Independence and Security Act of 2007 (EISA) as biofuels other than ethanol derived from corn starch (kernels) and having 50% lower lifecycle greenhouse gas emissions relative to gasoline.

4 Revenue from advanced biofuel infrastructure includes that from the entity’s retail operations (i.e., fuel stations), joint ventures with primary producers, or technologies that enable the production of advanced biofuels.

5 If there is a significant difference between the total addressable market and the market that the entity can serve through its existing or planned capabilities, sales channels, or products (i.e., the serviceable available market) then the entity may disclose this information.

6 The entity may provide a projection of growth of this market, where the projected addressable market is represented—based on a reasonable set of assumptions about changes in market conditions—as a percentage of year-on-year growth or as an estimate of the market size after a defined period (i.e., the market size in 10 years).

6.1 The entity may disclose its target three-year market share as a measurement of targeted growth, where the target is the percentage of the total addressable market that the entity plans to address over a three-year time horizon.

7 The entity may discuss other non-revenue generating initiatives it has undertaken to commercialize biofuels, such as partnerships (e.g., pilot projects, research and development projects) with fleet operators (air, ground, or marine transportation), airlines, vehicle manufacturers, and governmental agencies (e.g., U.S. Department of Agriculture, U.S. Department of Energy, or armed forces).
Pricing Integrity & Transparency

Topic Summary
Regulators such as the U.S. Federal Trade Commission (FTC), and the U.S. Commodity Futures Trading Commission (CFTC) are responsible for overseeing issues related to pricing integrity and transparency, which includes the potential for market manipulation by oil and gas companies, including Refining & Marketing (R&M) companies. Regulatory agencies focusing on refineries may investigate various competitive factors, including utilization and maintenance decisions, product supply decisions, product margins, and capital planning, creating uncertainty regarding future enforcement. The focus of enforcement actions also includes reporting prices to price index publishers, as well as potential price distortions through trading positions in physical transactions, and swaps, futures, and derivatives. Maintaining market integrity and ensuring transparency in product pricing can therefore lower regulatory risks and liabilities for R&M companies and protect consumers from unfair pricing.

Accounting Metrics

**EM-RM-520a.1. Total amount of monetary losses as a result of legal proceedings associated with price fixing or price manipulation**

1. The entity shall disclose the total amount of monetary losses it incurred during the reporting period as a result of legal proceedings associated with associated with price gouging, price fixing, or price manipulation.

2. The legal proceedings shall include any adjudicative proceeding in which the entity was involved, whether before a court, a regulator, an arbitrator, or otherwise.

3. The losses shall include all monetary liabilities to the opposing party or to others (whether as the result of settlement or verdict after trial or otherwise), including fines and other monetary liabilities incurred during the reporting period as a result of civil actions (e.g., civil judgments or settlements), regulatory proceedings (e.g., penalties, disgorgement, or restitution), and criminal actions (e.g., criminal judgment, penalties, or restitution) brought by any entity (e.g., governmental, business, or individual).

4. The scope of monetary losses shall exclude legal and other fees and expenses incurred by the entity in its defense.

5. The scope of disclosure shall include, but is not limited to, legal proceedings associated with the enforcement of relevant industry regulations promulgated by regional, federal, state, and local regulatory authorities, such as:

   5.1 The U.S. Commodity Futures Trade Commission

   5.2 The U.S. Federal Trade Commission

Note to EM-RM-520a.1
1  The entity shall briefly describe the nature (e.g., judgment or order issued after trial, settlement, guilty plea, deferred prosecution agreement, non-prosecution agreement) and context (e.g., price fixing, false price reporting) of all monetary losses as a result of legal proceedings.

2  The entity shall describe any corrective actions it has implemented as a result of the legal proceedings. This may include, but is not limited to, specific changes in operations, management, processes, products, business partners, training, or technology.
Management of the Legal & Regulatory Environment

**Topic Summary**
The Oil & Gas – Refining & Marketing industry is subject to numerous sustainability-related regulations and an often rapidly changing regulatory environment. Changes to the legal and regulatory environment may result in material impacts on shareholder value. Companies in the industry regularly participate in the regulatory and legislative process on a wide variety of environmental and societal issues. Such engagement can result from companies seeking to ensure industry views are represented in the development of regulations impacting the industry as well as to represent shareholder interests. At the same time, such engagement to influence environmental laws and regulations may adversely affect companies’ reputations and ultimately impact a company’s social license to operate.

**Accounting Metrics**

**EM-RM-530a.1. Discussion of corporate positions related to government regulations and/or policy proposals that address environmental and social factors affecting the industry**

1. The entity shall identify risks and opportunities it faces related to legislation, regulation, and/or rulemaking, (hereafter referred to collectively as “legal and regulatory environment”) related to environmental and social factors which are relevant to the entity’s business.

   1.1 The scope shall include existing, emerging, and known future risks and opportunities.

   1.2 The scope shall include risks and opportunities that may exist domestically and internationally at the local, state, and national level.

   1.3 The regulatory environment related to relevant environmental and social factors includes, but is not limited to, those related to non-greenhouse gas emissions, greenhouse gas emissions, water withdrawals and effluents, hazardous materials management, employee health and safety, product specifications, and pricing integrity and transparency.

2. Relevant risks include, but are not limited to, risk of increased compliance costs, risk of policy reversal (e.g., risks associated with changes to the U.S. Clean Air Act, EU Emissions Trading Scheme, or the California Global Warming Solutions Act), risk of loss of financial incentives (e.g., reduction or elimination of tax deductions, policies impacting import or export of crude oil or refined products, or policies impacting renewable fuel mandates), risk to reputation due to the entity’s stance and actions related to the legal and regulatory environment, risk that the legal and regulatory environment may not be aligned with long-term strategy, and risk of misalignment with the expectations of customers, investors, and other stakeholders.
Relevant opportunities include, but are not limited to, improved financial conditions (e.g., through policies which incentivize renewable fuel production and/or blending), improved community relations due to the entity's stance and actions related to the legal and regulatory environment, and other benefits due to alignment of the legal and regulatory environment with the entity's long-term strategy.

The entity shall discuss its efforts to manage risks and opportunities associated with each aspect of the legal and regulatory environment associated with the topics included in the SASB Oil & Gas – Refining and Marketing Standard that are relevant to the entity's business.

The entity shall discuss its overall strategy to manage risks and opportunities associated with each aspect of the legal and regulatory environment it has identified, which may include, but is not limited to:

5.1 Any changes it has made or plans to make to its business structure or model

5.2 The development of new technologies or services

5.3 Any changes it has made or plans to make to its operational process, control, or organizational structures

5.4 Influencing the regulatory or legislative process and outcomes, including but not limited to, interactions with regulators, regulatory agencies, legislators, policymakers, and any others involved in the regulatory or legislative process

The entity may describe whether its stance may align with or differ from the official stance of its industry organization(s) and discuss any relevant reasons for alignment or divergence.
Critical Incident Risk Management

**Topic Summary**

The operations of Refining & Marketing companies are often characterized by a high number of hazards, including the handling of flammable, volatile substances, the use of highly reactive chemicals, and the processing of fluids at high temperature and pressure. Releases of hydrocarbons or other hazardous substances as a result of accidents can have significant consequences for a company's workforce, as well as external social and environmental consequences. In addition to effective process safety management practices, companies frequently prioritize developing a culture of safety to reduce the probability that accidents and other health and safety incidents will occur. If accidents and other emergencies do occur, companies with a strong safety culture are often able to more effectively detect and respond to such incidents. A culture that engages and empowers employees and contractors to work with management to safeguard their own health, safety, and well-being and prevent accidents is likely to help companies reduce production downtime, mitigate costs, ensure workforce productivity, and maintain their license to operate.

**Accounting Metrics**

**EM-RM-540a.1. Process Safety Event (PSE) rates for Loss of Primary Containment (LOPC) of greater consequence (Tier 1) and lesser consequence (Tier 2)**

1  The entity shall disclose Tier 1 process safety event (PSE) rates and Tier 2 PSE rates for instances of loss of primary containment (LOPC).

1.1  The entity shall refer to the terms and definitions from the ANSI/API Recommended Practice 754 – Process Safety Performance Indicators for the Refining and Petrochemical Industries (hereafter, ANSI/API RP-754).

2  A PSE is defined as an unplanned or uncontrolled LOPC of any material including non-toxic and non-flammable materials (e.g., steam, hot condensate, nitrogen, compressed CO\(_2\) or compressed air) from a process, or an undesired event or condition that, under slightly different circumstances, could have resulted in an LOPC of a material.

2.1  LOPC is a type of event.

2.2  An unplanned or uncontrolled release is an LOPC irrespective of whether the material is released into the environment, or into secondary containment, or into other primary containment not intended to contain the material released under normal operating conditions.

3  A Tier 1 PSE is defined as a LOPC with the greatest consequence, resulting in one or more of the following consequences:

3.1  An employee, contractor or subcontractor experiencing a “days away from work” injury and/or fatality.

3.2  A hospital admission and/or fatality of a third party.
3.3 An officially declared community evacuation or community shelter-in-place.

3.4 A fire or explosion resulting in greater than or equal to $100,000 in direct costs to the entity.

3.5 A pressure relief device (PRD) discharge to atmosphere, whether directly or via a downstream destructive device that results in one or more of the following four consequences:

3.5.1 Liquid carryover

3.5.2 Discharge to a potentially unsafe location

3.5.3 An onsite shelter-in-place

3.5.4 Public protective measures (e.g., road closure) and a PRD discharge quantity greater than the threshold quantities specified in Table 1 of ANSI/API RP-754 in any one-hour period

3.6 A release of material greater than the threshold quantities specified in Table 1 of ANSI/API RP-754 in any one hour period.

4 A Tier 2 PSE is defined as a LOPC with lesser consequence, not disclosed as a Tier 1 PSE, and resulting in one or more of the following consequences:

4.1 An employee, contractor or subcontractor recordable injury.

4.2 A fire or explosion resulting in greater than or equal to $2,500 in direct costs to the entity.

4.3 A PRD discharge to atmosphere, whether directly or via a downstream destructive device that results in one or more of the following four consequences:

4.3.1 Liquid carryover

4.3.2 Discharge to a potentially unsafe location

4.3.3 An onsite shelter-in-place

4.3.4 Public protective measures (e.g., road closure) and a PRD discharge quantity greater than the threshold quantities specified in Table 2 of ANSI/API RP-754 in any one-hour period

4.4 A release of material greater than the threshold quantities specified in Table 2 of ANSI/API RP-754 in any one-hour period.

5 The Tier 1 PSE Rate shall be calculated as: \( \frac{\text{Total Tier 1 PSE Count}}{\text{Total Hours Worked}} \times 200,000 \)

6 The Tier 2 PSE Rate shall be calculated as: \( \frac{\text{Total Tier 2 PSE Count}}{\text{Total Hours Worked}} \times 200,000 \)
EM-RM-540a.2. Challenges to Safety Systems indicator rate (Tier 3)

1 The entity shall disclose a rate of Tier 3 “challenges to safety systems.”

1.1 The entity shall refer to the terms, definitions, and guidance from the ANSI/API RP-754 (Section 7.2). Tier 3 indicators may alternatively be referred to as “near miss” events or “high learning value” events.

2 A Tier 3 operational situation is defined as a flaw or weakness within internal technical safety systems that led to consequences that fall below the Tier 1 and Tier 2 loss of primary containment (LOPC) impact threshold, such as:

2.1 Demands on safety systems, which are activations (non-manual) of safety systems designed to prevent or mitigate impacts from losses of primary containment, such as mechanical shutdown equipment or pressure relief devices.

2.2 Safe operating limit excursions, which are breaches of safe operating limits for processes beyond which manual or automatic systems return the process to a predetermined safe state.

2.3 Primary containment inspections or testing results outside acceptable limits, which occur when inspection or testing shows that safe primary containment operating limits have been exceeded and require repairs, replacement, or further testing of equipment.

2.4 Near miss incidents, which are incidents that had the potential to result in an LOPC, but that were avoided by circumstance.

3 Disclosure may include situations with no actual consequences but the recognition that, in other circumstances, further barriers could have been breached and a Tier 1 or Tier 2 PSE could have resulted.

4 The Tier 3 indicator rate shall be calculated as: (Total Tier 3 Indicator Count / Total Hours Worked) × 200,000.

5 Total hours worked include employees and contractors.

EM-RM-540a.3. Discussion of measurement of Operating Discipline and Management System Performance through Tier 4 Indicators

1 The entity shall describe its approach to identifying, measuring, and managing “Operating Discipline and Management System Performance,” or Tier 4 key performance indicators (KPIs).

1.1 Tier 4 indicators are metrics developed by the entity–specific to its facilities, operations, and safety priorities—that measure leading, proactive measures to maintain and improve safety and manage risk.

1.2 Relevant Tier 4 KPIs may be focused on:
1.2.1 Engineering and inherently safe design
1.2.2 Equipment maintenance, inspection and testing
1.2.3 Process hazard and major incident risk assessments
1.2.4 Quality of, and adherence to, operating procedures
1.2.5 Contractor capability and management
1.2.6 Audit improvement actions
1.2.7 Asset integrity and process safety initiatives
1.2.8 Workforce and management training and development
1.2.9 Technical competence assessment and assurance

2 Discussion may include the use of specific Tier 4 KPI such as those suggested in ANSI/API RP-754. Examples of Tier 4 KPIs are:

2.1 Number of process area retrospective and revalidation hazard evaluations completed on time
2.2 Percentage and/or number of past-due process safety actions
2.3 Percentage of process safety required training sessions completed with skills verification

3 The entity may exclude quantitative data or figures for its Tier 4 KPIs from the scope of disclosure because they are generally not suitable for peer-to-peer benchmarking and may not be relevant at a corporate level (i.e., they may be refinery-specific). It may be relevant, however, to discuss:

3.1 Trends in Tier 4 KPIs over time and how they are correlated with the frequency of Tier 1, Tier 2, and Tier 3 indicator rates (e.g., that an increase in the focus on Tier 4 performance can be correlated with a decrease in the Tier 1 PSE rate)
3.2 Application and topical focus of Tier 4 KPIs for different facilities, business units, geographies, and employee categories.