NETL Life Cycle Inventory Data
Process Documentation File

Process Name:	Brine water storage tank
Reference Flow:	1 kg of brine water output
Brief Description:	Methane losses from a brine water storage tank at an enhanced oil recovery (EOR) extraction site

Section I: Meta Data

Geographical Coverage:	United States	**Region:** Permian Basin	
Year Data Best Represents:	2010		
Process Type:	Basic Process (BP)		
Process Scope:	Gate-to-Gate Process (GG)		
Allocation Applied:	No		
Completeness:	All Relevant Flows Captured		

Flows Aggregated in Data Set:

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

Relevant Output Flows Included in Data Set:

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

Adjustable Process Parameters:

CH4	*[kg/kg] kg of methane losses per kg of brine water*
Water_in	*[kg/kg] kg of brine water input to storage tank, including the mass of methane lost during storage*

Tracked Input Flows:

Brine water   *[Technosphere] Brine water from oil/gas/water separation at oilfield*

Tracked Output Flows:

Brine water   *Reference flow (brine water output)*
Methane   *Methane to venting and flaring*

Section II: Process Description

Associated Documentation

This unit process is composed of this document and the data sheet (DS) *DS_Stage3_O_Brine_Water_Storage_Tank_2012.01.xls*, which provides additional details regarding relevant calculations, data quality, and references.

Goal and Scope

This unit process provides a summary of relevant input and output flows associated with the storage of brine water in a tank at an enhanced oil recovery (EOR) site. The flashing and working losses of a storage tank result in methane emissions that are recovered by vapor recovery equipment and sent to venting or flaring. The reference flow of this unit process is 1 kg of brine water output.

Boundary and Description

This unit process provides a summary of relevant input and output flows associated with the storage of brine water in a tank at an enhanced oil recovery (EOR) site. The flashing and working losses of a storage tank result in methane emissions that are recovered by vapor recovery equipment and sent to venting or flaring.

The data for this unit process are based on NETL's assessment of EOR technologies (NETL, 2010). Most of the methane from oilfield separation processes end up in the crude oil and hydrocarbon gas streams, but a small fraction remains in the brine water produced by oil and gas extraction. The concentration of methane is 0.0015 tonnes of methane per thousand barrels of brine water. This unit process assumes that all of this methane is released from the brine water during storage.

DF_Stage3_O_Brine_Water_Storage_Tank_2012.01.doc

A vapor recovery unit (VRU) is installed on the water storage tank, diverting all methane emissions to venting or flaring. This unit process does not include the emissions from venting or flaring – such emissions are accounted for in another unit process downstream from the water storage tank.
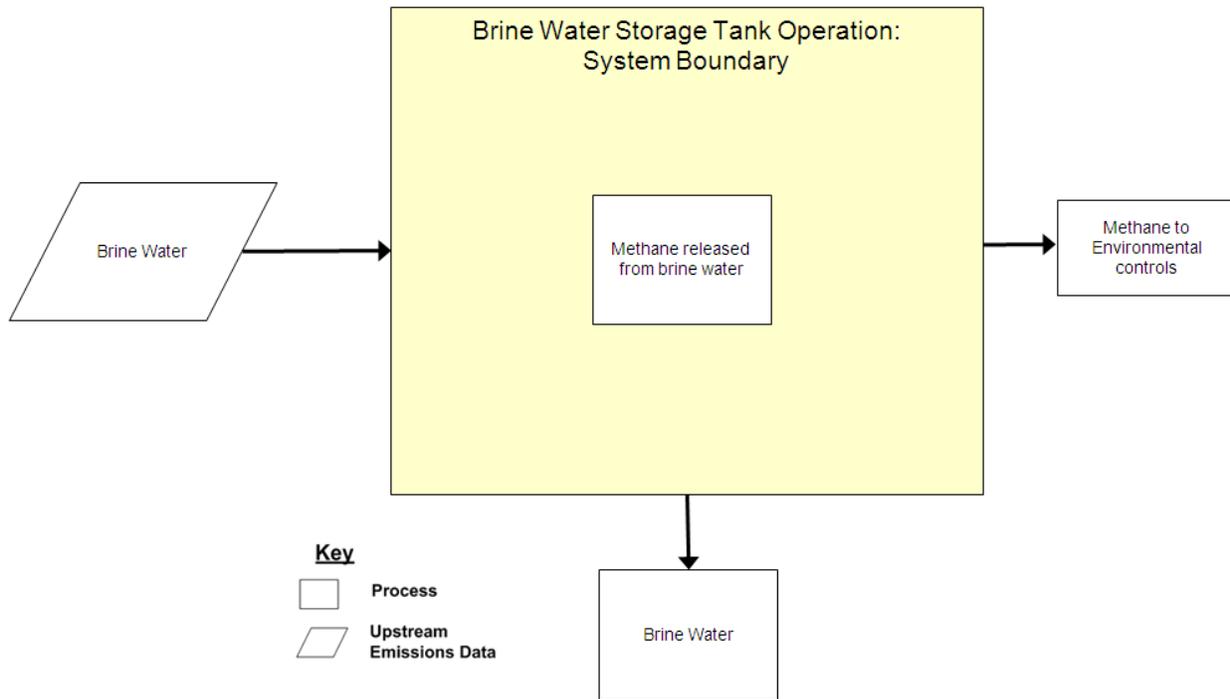
Figure 1: Unit Process Scope and Boundary

DF_Stage3_O_Brine_Water_Storage_Tank_2012.01.doc

Table 1: Methane Content in Brine Water

Property	Value	Units	Reference
Methane Content in Brine	0.0015	tonnes methane /1,000 bbl water	NETL, 2010

Table 2: Unit Process Input and Output Flows

Flow Name	Value	Units (Per Reference Flow)
Inputs		
Brine water	1.00000943	kg
Outputs		
Brine water	**1.00**	kg
Methane [intermediate product]	9.43E-06	kg

* **Bold face** clarifies that the value shown *does not* include upstream environmental flows.

Embedded Unit Processes

None.

References

NETL, 2010.

NETL, 2010. An Assessment of Gate-to-Gate Environmental Life Cycle Performance of Water-Alternating-Gas CO_2-Enhanced Oil Recovery in the Permian Basin, National Energy Technology Laboratory, Pittsburgh, PA. Accessed on September 27, 2012 at http://www.netl.doe.gov/energy-analyses/refshelf/PubDetails.aspx?Action=View&PubId=333.

Section III: Document Control Information

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Section IV: Disclaimer

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