

Pacific States/British Columbia Oil Spill Task Force

Summary of West Coast Oil Spill Data

Calendar Year 2014

June 2015



CONTACT INFORMATION

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Data analysis and summary report
by Camille Stephens

OIL SPILL DATA PROJECT

Summary of Regional Spill Data (CY 2014)

The Task Force's regional oil spill database, which was launched in 2003, is a unique and valuable resource that enables us to track regional trends in spills and related causal factors. Using a standardized data dictionary to ensure uniform entries, we collect data on all spills of a barrel (42 gallons) or larger.

DATABASE WORKGROUP

Database Workgroup provides staff-level coordination to help ensure that data is collected in a consistent manner by all Task Force member agencies. The Pacific States/British Columbia Oil Spill Task Force Data Dictionary (available at oilspilltaskforce.org/ourwork/data-project/) was developed by the Database Workgroup and establishes standardized terms and definitions for collecting spill data.

Workgroup members include:

- Jason Seifert (Alaska Department of Environmental Conservation)
- Cathy Conway, Adrian Chatigny, and Damon Williams (California Department of Fish and Wildlife, Office of Spill Prevention and Response)
- Mike Zollitsch (Oregon Department of Environmental Quality)
- Marcia Graf and Curtis Martin (Hawaii Department of Human Health)
- Jack Barfield (Washington Department of Ecology)

The British Columbia Ministry of Environment monitors the project, is developing a spill database, and plans to join the Task Force project as soon as possible.

DATA LIMITATIONS

- Each agency that assists in the creation and maintenance of the Task Force database in no way guarantees the accuracy of the information and no guarantee of accuracy shall be expressed or implied.
- Only spills of one barrel (42 gallons) or larger are included in our Database.
- The Task Force oil spill database is created and maintained for informational purposes only. The data it contains reflects the respective agencies' best information at the time it was entered in the database. This means that recorded quantities may be under-reported. It remains an ongoing challenge to refine the information entered to a level of specificity that supports effective analysis while

also taking into account the varied collection capabilities of member agencies.

HIGHLIGHTS

The 2014 data is provided on the following pages. Highlights include:

- A total of 1,193 releases occurred during 2014, with a total volume of 979,655 gallons spilled. Of those, 15 releases were over 10,000 gallons.

Non-Crude Spills

- 1,103 releases were non-crude spills totaling 877,942 gallons.
- Facilities (64%) and Vehicles (19%) were the major sources of non-crude spills during 2014.
- Over half of the total non-crude spill volume was attributable to Equipment Failure (55%).
- 84% of the total non-crude volume was comprised of spills with volumes greater than 1,000 gallons.
- More than three-quarters (79%) of the non-crude volume was spilled to Land.

Crude Oil Spills

- 90 Crude oil releases totaling 101,713 gallons occurred in 2014.
- Crude oil comprised 10% the total volume for 2014.
- Nearly half (48%) of the crude oil spill volume during 2014 was due to Unknown causes.
- Mechanical failure (85%) comprised over three-quarters of spill volume due to Equipment Failure.
- During 2014, crude spills to Land (87%) comprised the highest percent total volume.

We note that California's spill volumes often exceed that from other West Coast states; this reflects California's uniqueness. California has the largest population of all our member jurisdictions, which means more transportation of petroleum products to cover demand, which increases the statistical likelihood of an incident. In addition, California produces as well as refines petroleum, which further increases the risk of spills. California also has an aging infrastructure that has not been well maintained by producers, driving up the number of oil-water spills to land in recent years. California's Office of Spill Prevention and Response has no prevention jurisdiction over these producers.

Trends

The 2002-2014 data provides us with an opportunity to look at 13-year trends, which is also shown in this report. Here are the highlights:

- A total of 13,181, releases occurred during the 13-year period 2002-2014, with a total volume of more than 11 million gallons.
- Over that 13-year period, the combined volume of Non-Crude spills was 2.5 that for Crude Oil spills.
- The top two Crude Oil spills during the 13-year period were 463,848 gallons in California (2008) and a 267,000 gallon spill in Alaska (2006). The combined volume of these two incidents comprised 25% of the total Crude Oil volume released for the period.
- Facilities (53%) and Pipelines (19%) were the major sources of spills during the 13-year period.
- Equipment Failure (55%) and Human Error (30%) were the major spill causes.

FOR MORE INFORMATION

Data summaries for calendar years 2002 – 2014, as well as other information about the Pacific States/British Columbia Oil Spill Task Force and its work, are available at www.oilspilltaskforce.org. Summaries for years prior to 2012 are included in the Task Force Annual Reports for those years. Beginning with calendar year 2012, the data summary was created as a separate document available at oilspilltaskforce.org/ourwork/data-project/

For questions specifically related to this report or the Task Force's data project, contact Sarah Brace, Executive Coordinator at Sarah@VedaEnv.com.

Summary of Releases by Product (2014)

Product	Spill Count	Gallons	% Total Volume
Asphalt / Creosote	17	295,299	30.1%
Oily Water Mixture	70	260,366	26.6%
Diesel oil / Marine Gas Oil	544	122,756	12.5%
Crude Oil	90	101,713	10.4%
Waste oil	28	47,443	4.8%
Jet Fuel / Kerosene	33	39,840	4.1%
Gasoline	61	27,809	2.8%
Oily Waste	2	20,250	2.1%
Mineral oil / Transformer oil	122	14,701	1.5%
Heating oil	44	14,696	1.5%
Other	21	11,428	1.2%
Hydraulic Oil	76	8,264	0.8%
Lube oil / Motor oil	49	7,364	0.8%
Aviation Gasoline	13	2,498	0.3%
Edible / Vegetable oil	11	1,828	0.2%
Unknown	8	1,736	0.2%
Bunker C / IFO / HFO	3	1,414	0.1%
LNG / LPG	1	250	0.03%
Total	1,193	979,655	

2014

ANNUAL SUMMARY OF SPILLS

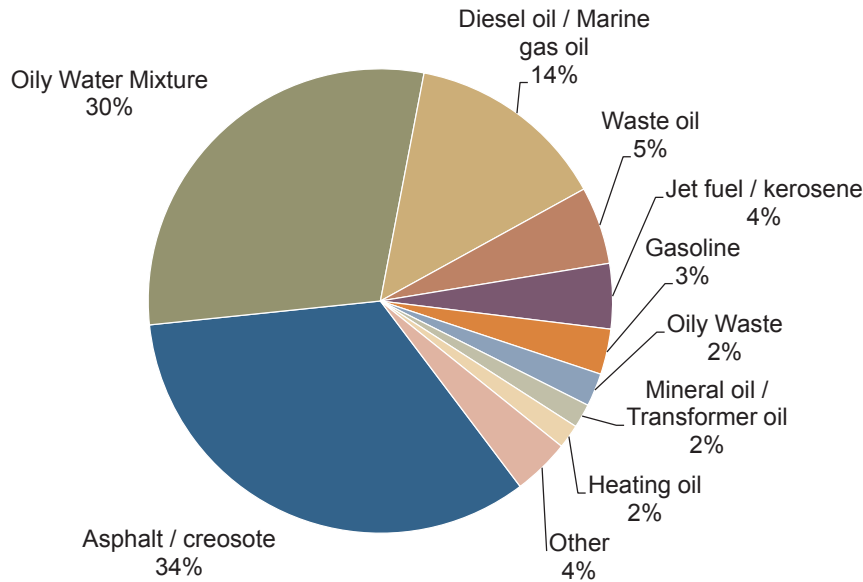
- A total of 1,193 releases occurred during 2014, with a total volume of 979,655 gallons.

Spills Greater Than 10,000 Gallons (2014)

Product	Volume	State	Date	Source Type	Cause Type	Medium
Asphalt / Creosote	203,000	Washington	1/22/2014	Facility	Equipment Failure	Land
Asphalt / Creosote	60,000	California	12/27/2014	Facility	Unknown	Land
Oily Water Mixture	58,128	California	4/6/2014	Facility	Equipment Failure	Land
Waste Oil	44,000	Washington	1/31/2014	Private Property	Unknown	Impermeable surface
Oily Water Mixture	33,600	California	11/9/2014	Unknown	Unknown	Land
Oily Water Mixture	30,000	California	2/3/2014	Vehicle	Other	Fresh Water
Jet fuel / Kerosene	27,000	Hawaii	1/13/2014	Facility	Equipment Failure	Land
Oily Water Mixture	24,360	California	5/9/2014	Facility	Human Error	Land
Oily Water Mixture	21,000	California	4/10/2014	Facility	Equipment Failure	Land
Oily Waste	20,000	Washington	11/13/2014	Facility	Equipment Failure	Impermeable surface
Asphalt / Creosote	20,000	Washington	10/6/2014	Vehicle	Unknown	Land
Oily Water Mixture	16,800	California	4/9/2014	Facility	Equipment Failure	Land
Crude Oil	14,700	California	3/2/2014	Unknown	Unknown	Land
Crude Oil	12,600	California	11/9/2014	Unknown	Unknown	Land
Oily Water Mixture	10,080	California	9/29/2014	Unknown	Unknown	Land

Non-Crude Spills by Product, All States (2014)

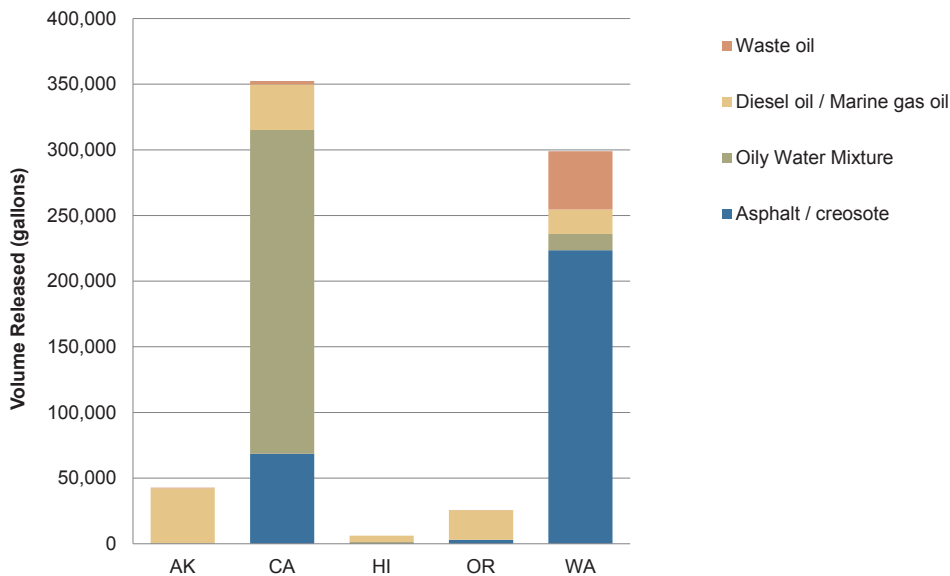
(percent total volume)



NOTE: "Other" includes classifications comprising 1% or less of the total volume released: Hydraulic oil, Lube oil/Motor oil, Aviation Gasoline, Edible/Vegetable Oil, Unknown, Bunker C/IFO/HFO, LNG/LPG

Non-Crude Spills by Product and State (2014)

(5% or more total volume)



2014

NON-CRUDE SPILLS

Total Spills 1,103
Total Volume (gal) 877,942
Average Spill Size (gal) 796

Summary by Product

Top Products

Product	Gallons
Asphalt / creosote	295,299
Oily Water Mixture	260,366
Diesel oil / Marine gas oil	122,756
Waste oil	47,443
Jet fuel / kerosene	39,840

- 1,103 non-crude spills totalling 877,942 gallons occurred during 2014.

2014

NON-CRUDE SPILLS

Summary by Source

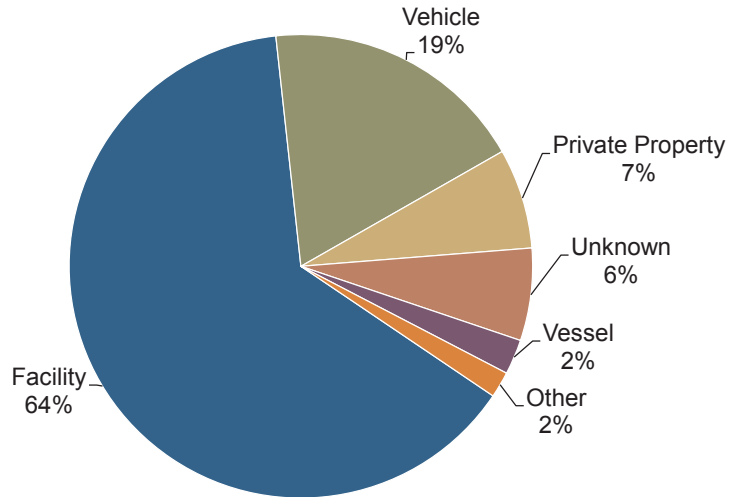
Top Sources

Source	Gallons
Facility	560,371
Vehicle	162,247
Private Property	61,334
Unknown	56,604
Vessel	21,459

- Facilities (64%) and Vehicles (19%) were the major sources of non-crude spills during 2014.

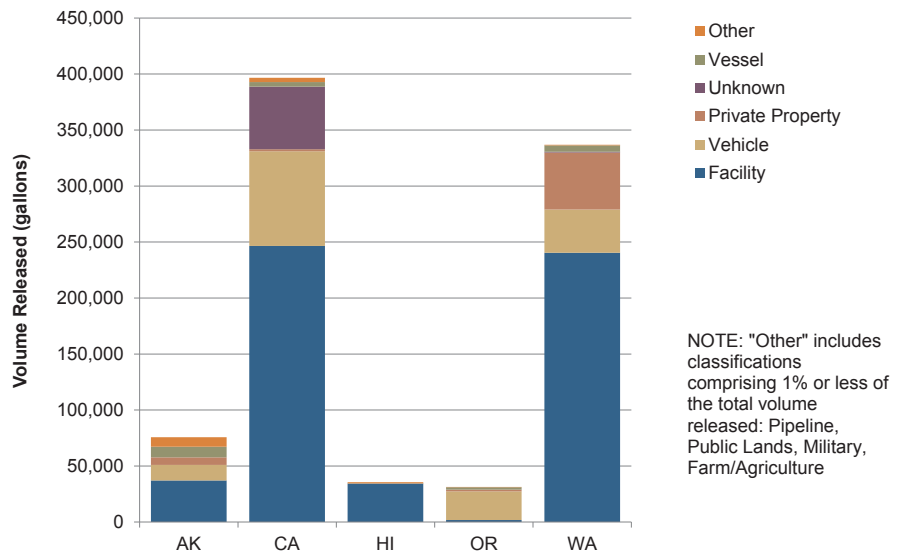
Non-Crude Spills by Source, All States (2014)

(percent total volume)



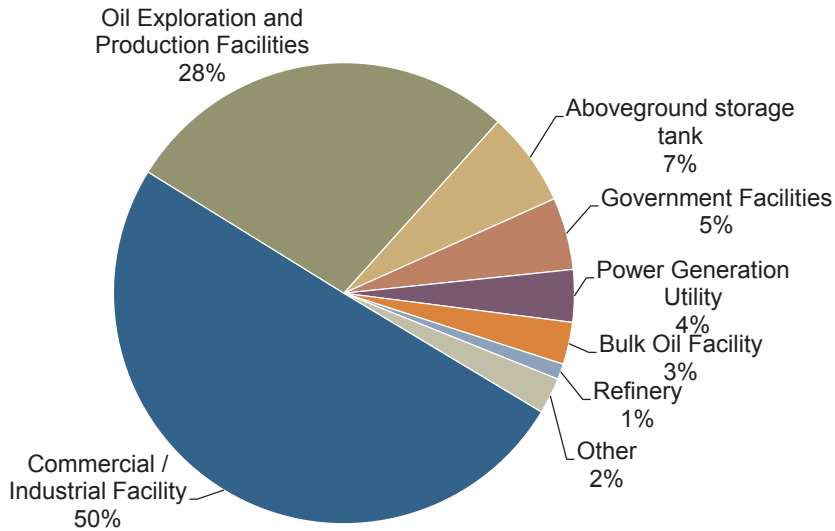
NOTE: "Other" includes classifications comprising 1% or less of the total volume released: Pipeline, Public Lands, Military, Farm/Agriculture

Non-Crude Spills by Source and State (2014)



Non-Crude Spills -- Facility Detail (2014)

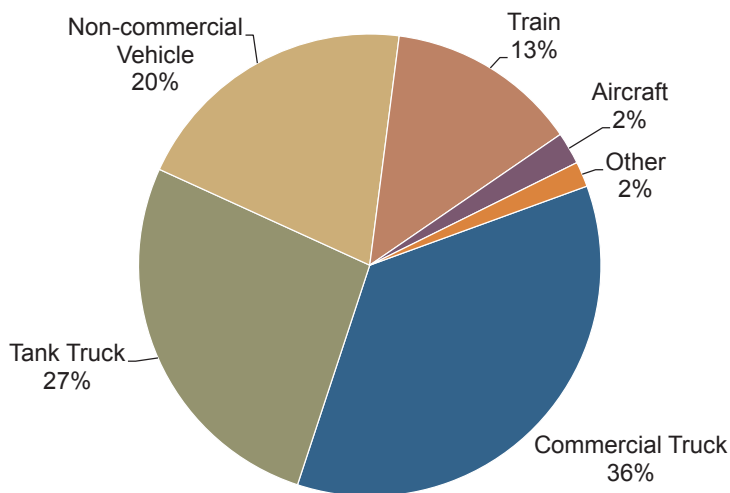
(percent total volume)



NOTE: "Other" includes classifications comprising 1% or less of the total volume released: Retail Petroleum Outlet, Drum or Container, Underground Storage Tank, Shipyard/Port Facility, Marine Terminal

Non-Crude Spills -- Vehicle Detail (2014)

(percent total volume)



NOTE: "Other" includes classifications comprising 1% or less of the total volume released: Construction/Utility Vehicle, Bus or Public Transportation

2014

NON-CRUDE SPILLS

Summary by Source (continued)

- Commercial/Industrial (50%) and Oil Exploration and Production Facilities (28%) were the top contributors to facility spills, comprising more than three-quarters of the total volume for that Source classification.
- Over half of the of the non-crude spill volume for vehicles was from Commercial Trucks (36%) and Tank Trucks (27%).

2014

NON-CRUDE SPILLS

Summary by Cause

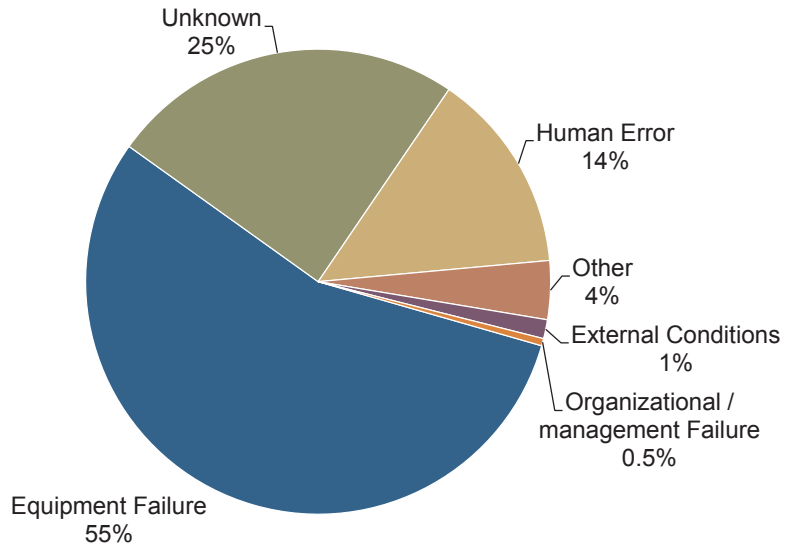
Top Causes

Cause	Gallons
Equipment Failure	486,708
Unknown	216,252
Human Error	123,164
Other	35,839
External Conditions	11,567

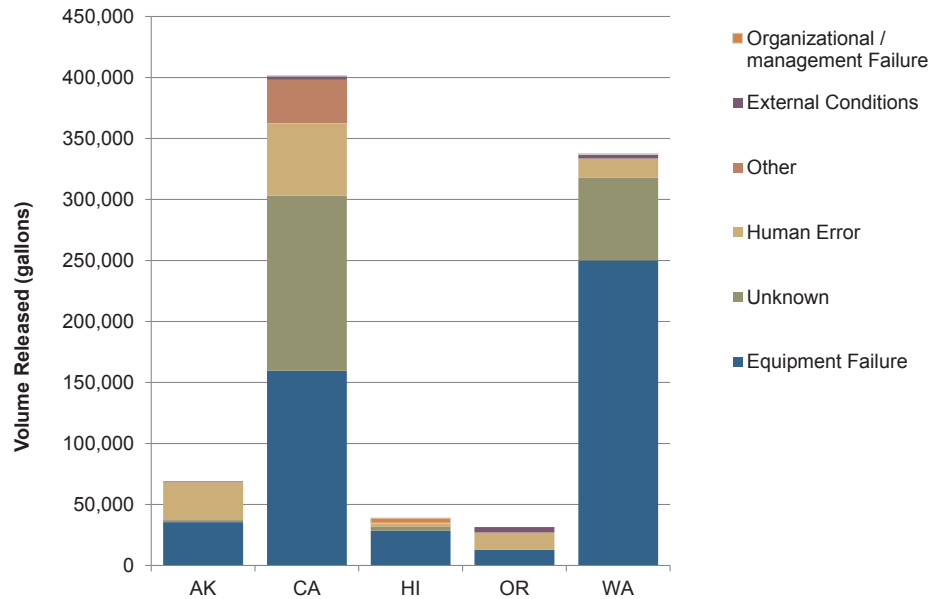
- Over half of the total non-crude spill volume was attributable to Equipment Failure (55%).

Non-Crude Spills by Cause, All States (2014)

(percent total volume)

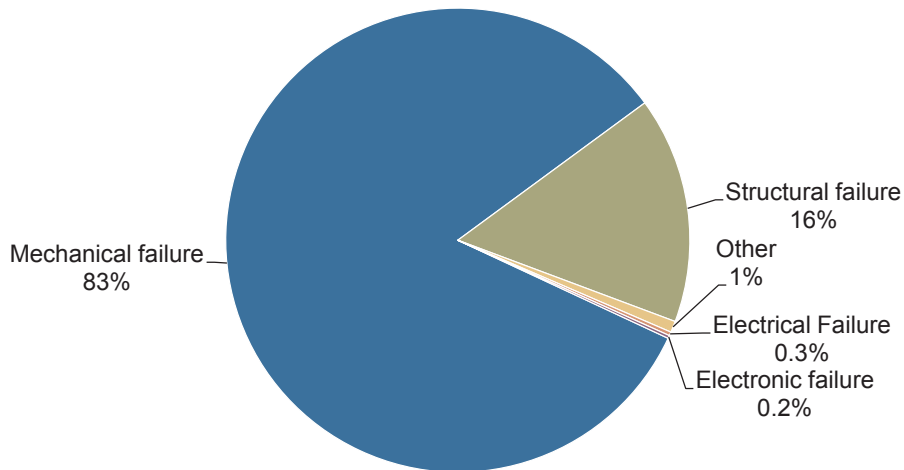


Non-Crude Spills by Cause and State (2014)



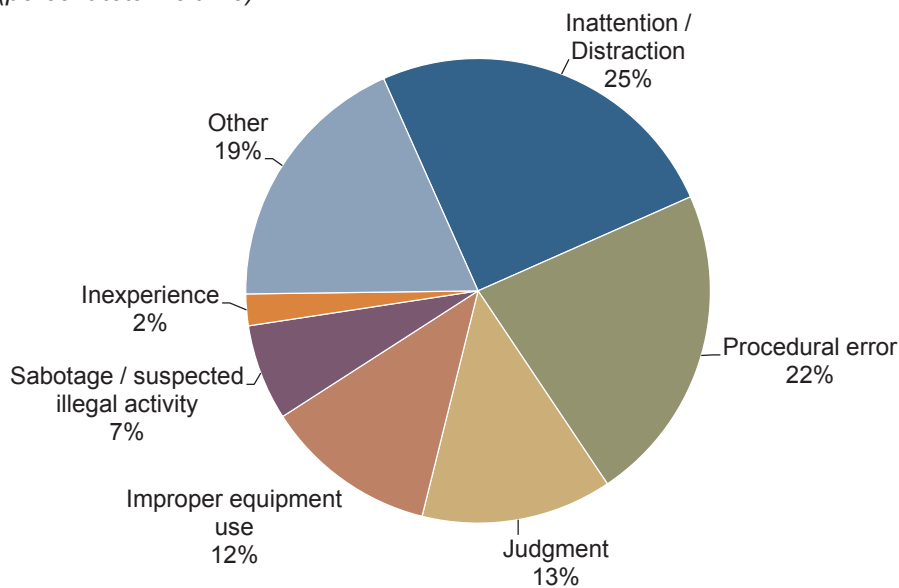
Non-Crude Spills -- Equipment Failure Detail (2014)

(percent total volume)



Non-Crude Spills -- Human Error Detail (2014)

(percent total volume)



NOTE: "Other" includes classifications comprising 1% or less of the total volume released: Deliberate violation, Fatigue/Reduced alertness, Inaccurate Computation, Illegal Drugs/Alcohol, Illness

2014

NON-CRUDE SPILLS

Summary by Cause (continued)

- More than three-quarters of the total Equipment Failure spill volume was due to Mechanical Failure (83%)
- Nearly half of the total Human Error spill volume was due to Procedural error (22%) or Inattention/Distracted (25%).

2014

NON-CRUDE SPILLS

Summary by Activity

Top Activities

Activity	Gallons
Static	339,109
Underway / in motion	338,950
Unknown	89,998
Tank / hold cleaning	46,119
Maintenance / testing	23,546

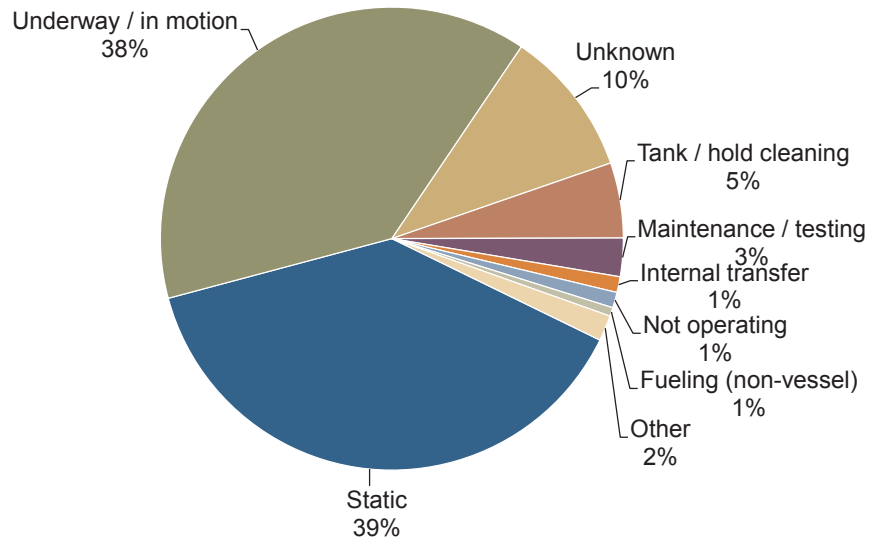
- Static¹ (39%) and Underway/In Motion² (38%) were the predominant activities at the time of the spill.

¹Static, or performing designed function, not to include oil transfers: (1) Vessel in port, performing designed function; (2) Facility or pipeline in normal operation, or facility storing oil; (3) Vehicle not underway but performing designed function

²Underway/In Motion: (1) Vessel underway conducting normal operations, no oil movements in progress (oil movements include ballasting, tank washing, internal transfers); (2) Vehicle in motion conducting designed function

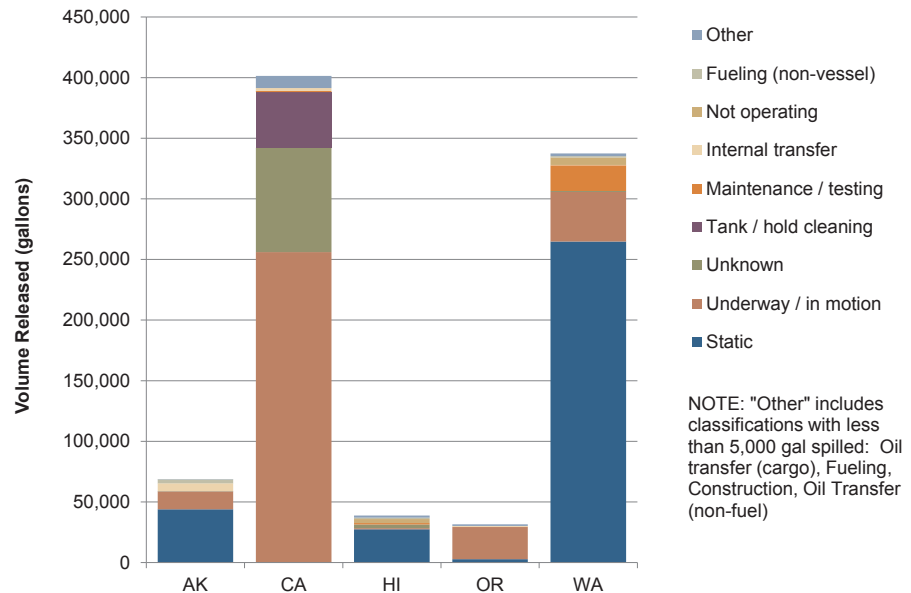
Non-Crude Spills by Activity (2014)

(percent total volume)



NOTE: "Other" includes classifications with less than 5,000 gal spilled: Oil transfer (cargo), Fueling, Construction, Oil Transfer (non-fuel)

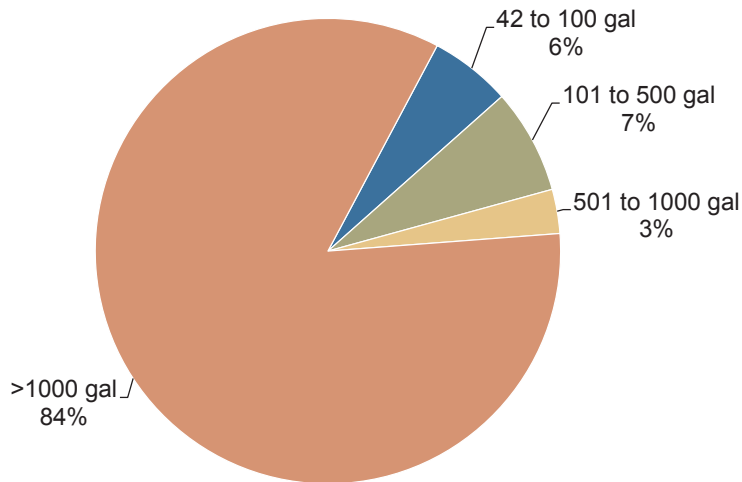
Non-Crude Spills by Activity and State (2014)



NOTE: "Other" includes classifications with less than 5,000 gal spilled: Oil transfer (cargo), Fueling, Construction, Oil Transfer (non-fuel)

Non-Crude Spills by Spill Size (2014)

(percent total volume)



2014

NON-CRUDE SPILLS

Summary by Spill Size

Size Class	Gallons
42 to 100 gal	49,662
101 to 500 gal	64,009
501 to 1000 gal	26,946
>1000 gal	737,325

- 84% of the total non-crude volume was comprised of spills with volumes greater than 1,000 gallons.

Non-Crude Spills by Spill Size and State (2014)



2014

NON-CRUDE SPILLS

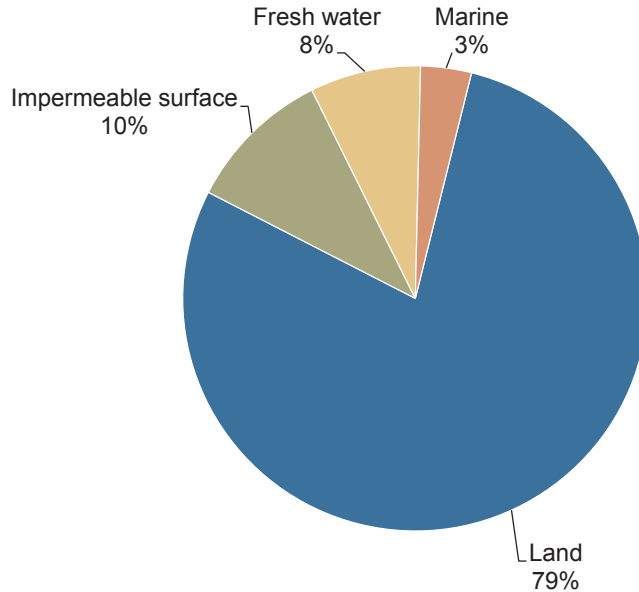
Summary by Medium

Medium	Gallons
Land	690,511
Impermeable surface	88,873
Fresh water	67,595
Marine	30,963

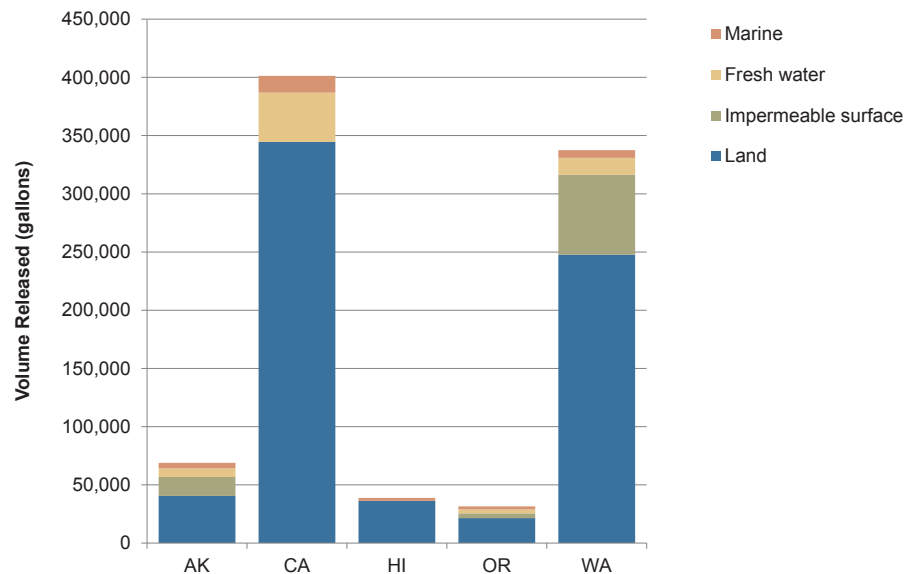
- More than three-quarters (79%) of the non-crude volume was spilled to Land.

Non-Crude Spills by Medium Impacted (2014)

(percent total volume)

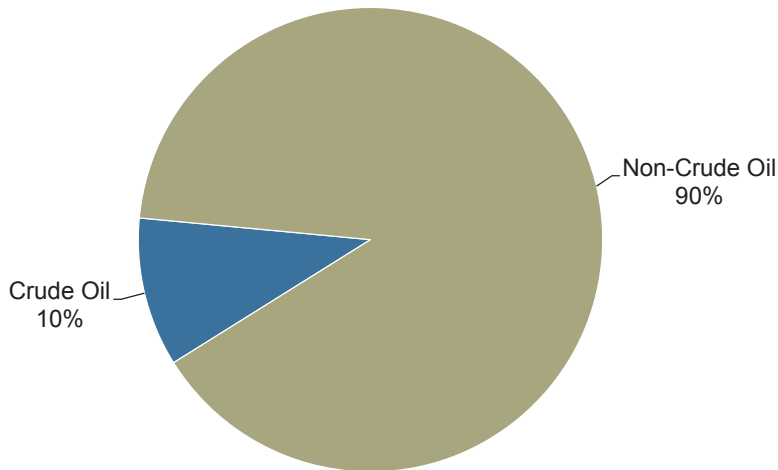


Non-Crude Spills by Medium and State (2014)



Crude Spills vs. Non-Crude Spills, All States (2014)

(percent total volume)



2014

CRUDE SPILLS

Total Spills	90
Total Volume (gal)	101,713
Average Spill Size (gal)	1,130

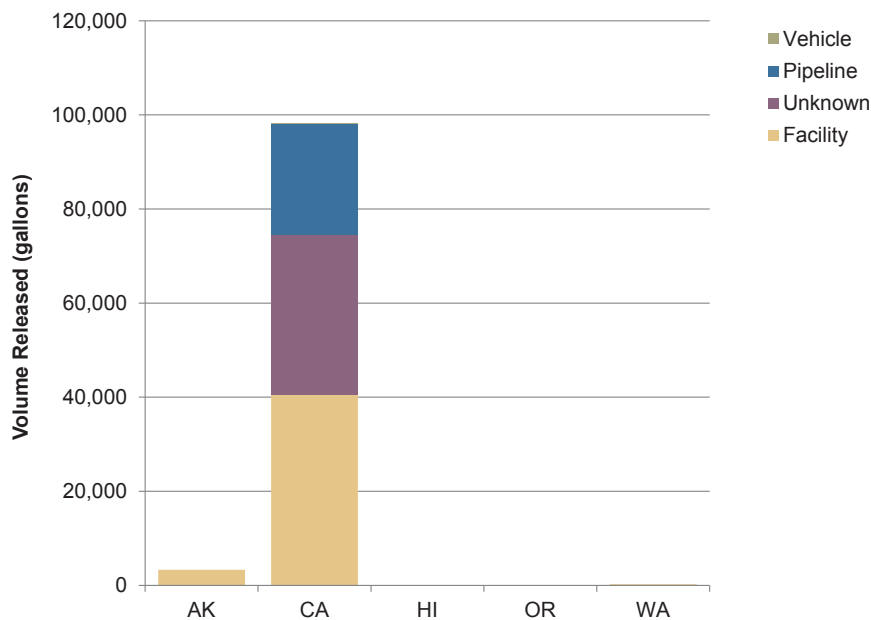
Product Type	Gallons
Non-crude Oil	877,942
Crude Oil	101,713
Total	979,655

- Crude oil comprised 10% the total volume for 2014.

Top Sources

Source Type	Gallons
Facility	44,204
Unknown	33,810
Pipeline	23,574
Vehicle	125

Crude Spills by Source Type and State (2014)



2014

CRUDE SPILLS

Top Causes

Cause Type	gallons
Unknown	49,355
Equipment Failure	33,491
Human Error	14,877
Other	3,990

- Nearly half (48%) of the crude oil spill volume during 2014 was due to Unknown causes.

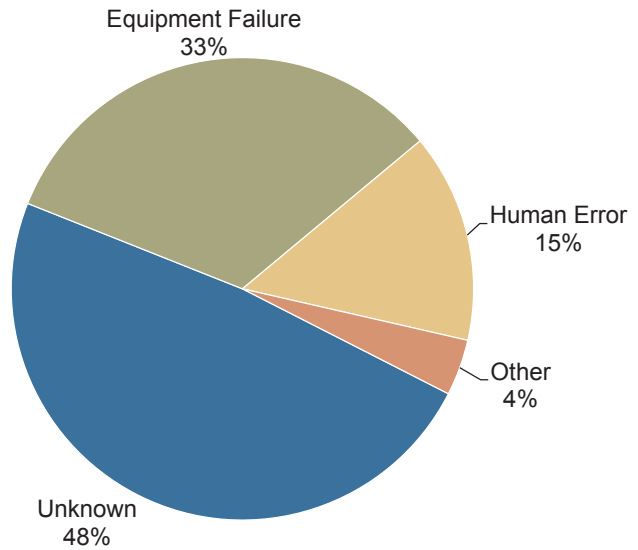
Equipment Failure Detail

Cause	gallons
Mechanical failure	28,577
Other	1,869
Structural failure	1,785
Electrical Failure	1,260

- Mechanical failure (85%) comprised over three-quarters of spill volume due to Equipment Failure.

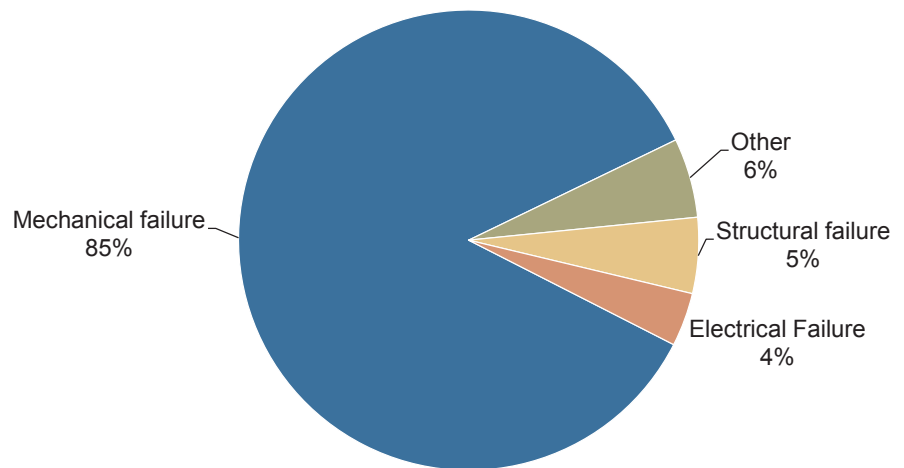
Crude Spills by Cause, All States (2014)

(percent total volume)



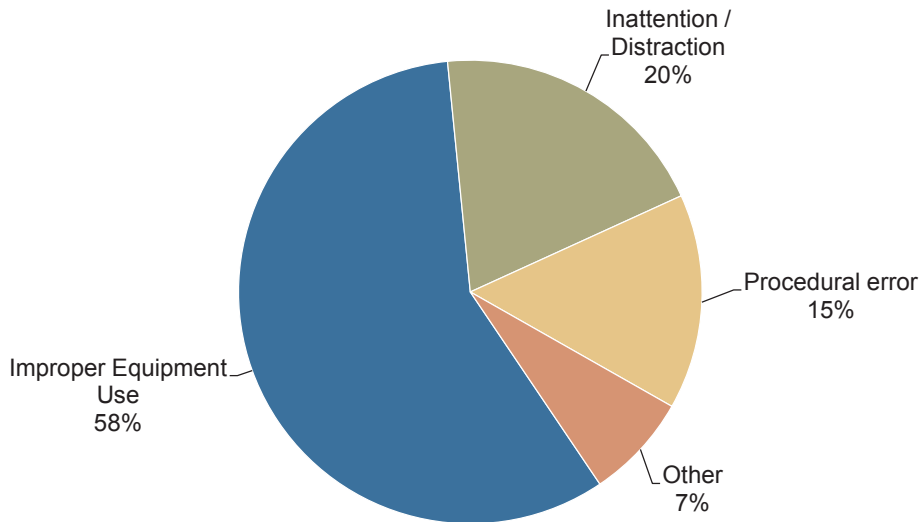
Crude Spills -- Equipment Failure Detail (2014)

(percent total volume)



Crude Spills -- Human Error Detail (2014)

(percent total volume)



2014

CRUDE SPILLS

Human Error Detail

Cause	gallons
Improper Equipment Use	8,610
Inattention/Distraction	2,940
Procedural error	2,235
Other	1,092

- Improper Equipment Use (58%) was the main cause of spills attributed to Human Error.

2014

CRUDE SPILLS

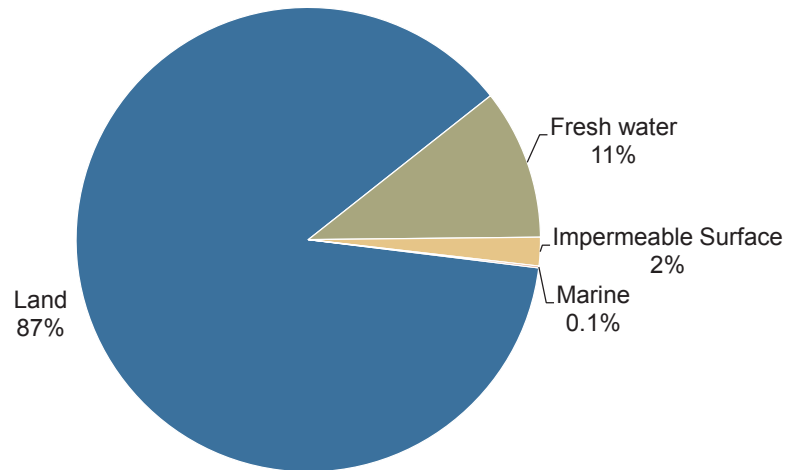
Summary by Medium

Medium	Gallons
Land	88,914
Fresh water	10,651
Impermeable Surface	2,022
Marine	126

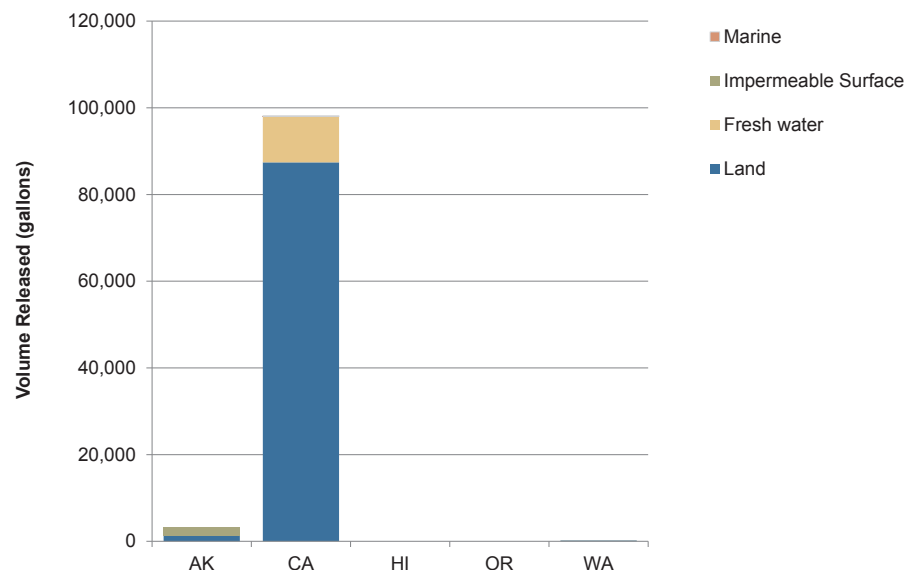
- During 2014, crude spills to Land (87%) comprised the highest percent total volume.

Crude Oil Spills by Medium Impacted (2014)

(percent total volume)



Crude Spills by Medium and State (2014)



SUMMARY OF SPILLS (2002-2014)

- A total of 13,181, releases occurred during the 13-year period 2002-2014, with a total volume of over 11 million gallons.

Releases by Product (2002-2014)

Product	Spill Count	Gallons	% Total Volume
Crude Oil	1,442	2,972,830	27%
Diesel oil / Marine Gas Oil	6,337	2,700,252	24%
Oily Water Mixture	561	1,570,285	14%
Bunker C / IFO / HFO	96	734,830	7%
Gasoline	481	631,893	6%
Other	391	588,614	5%
Asphalt / Creosote	161	505,959	5%
Mineral oil / Transformer oil	1,316	399,509	4%
Kerosene / Jet Fuel	274	273,440	2%
Aviation Gasoline	155	153,965	1.4%
Waste oil	327	137,209	1.2%
Unknown	126	124,757	1.1%
Lube oil / Motor oil	511	123,331	1.1%
Hydraulic Oil	671	85,966	0.8%
Heating oil	245	60,124	0.5%
Edible / Vegetable oil	70	54,733	0.5%
Oily Waste	2	20,250	0.2%
LNG / LPG	15	12,530	0.1%
Total	13,181	11,150,477	

Spills Greater Than 10,000 Gallons (2002-2014)

Number of Spills	139
Releases to Water	26
Crude	35
Non-crude	104

Product	Volume	State	Date	Source Type	Cause Type	Medium
Crude Oil	463,848	California	04/24/08	Pipeline	Equipment Failure	Land
Diesel Oil	420,000	California	10/30/07	Facility	Equipment Failure	Land
Bunker C / IFO / HFO	321,052	Alaska	12/08/04	Vessel	Human Error	Marine
Bunker C / IFO / HFO	270,000	Washington	08/25/04	Facility	Human Error	Land
Crude Oil	267,000	Alaska	03/02/06	Pipeline	Equipment Failure	Land
Asphalt / Creosote	203,000	Washington	01/22/14	Facility	Equipment Failure	Land
Other	193,200	California	01/04/10	Facility	Equipment Failure	Land
Crude Oil	191,562	Alaska	05/25/10	Pipeline	Equipment Failure	Impermeable Surface
Diesel Oil	145,000	Alaska	03/23/08	Vessel	Human Error	Marine
Diesel Oil	142,800	Alaska	01/11/10	Facility	Human Error	Marine
Oily Water Mixture	128,000	California	11/26/08	Facility	Equipment Failure	Land
Crude Oil	126,000	California	03/09/07	Facility	Equipment Failure	Land
Crude Oil	126,000	California	03/23/05	Pipeline	External Conditions	Fresh Water
Aviation gasoline	115,353	California	11/22/04	Pipeline	Equipment Failure	Land
Other	112,000	Oregon	05/04/11	Vehicle	Equipment Failure	Land
Oily Water Mixture	100,000	California	09/07/12	Facility	Equipment Failure	Fresh Water
Crude Oil	87,192	California	01/10/07	Facility	Equipment Failure	Land
Gasoline	80,000	California	08/31/13	Vehicle	Human Error	Land
Mineral Oil / Transformer Oil	70,000	California	04/16/13	Facility	Human Error	Fresh Water
Oily Water Mixture	63,000	California	07/29/08	Facility	Unknown	Land
Crude Oil	63,000	California	04/23/07	Facility	Equipment Failure	Land
Oily Water Mixture	63,000	California	01/17/12	Facility	Equipment Failure	Land
Asphalt / Creosote	60,000	California	12/27/14	Facility	Unknown	Land
Diesel Oil	58,800	California	07/07/07	Facility	Human Error	Land
Oily Water Mixture	58,128	California	04/06/14	Facility	Equipment Failure	Land
Bunker C / IFO / HFO	58,000	California	11/07/07	Vessel	Human Error	Marine
Waste Oil	44,000	Washington	01/31/14	Private Prop- erty	Unknown	Impermeable surface
Crude Oil	42,000	California	10/23/12	Facility	Organizational / man- agement Failure	Fresh Water
Crude Oil	42,000	California	06/12/07	Pipeline	Equipment Failure	Land
Mineral Oil / Transformer Oil	42,000	California	12/08/10	Facility	Equipment Failure	Land
Crude Oil	40,000	California	04/17/07	Pipeline	Equipment Failure	Land
Oily water mixture	37,306	California	11/11/06	Facility	Equipment Failure	Impermeable Surface
Oily Water Mixture	36,750	California	06/24/09	Facility	Equipment Failure	Land
Unknown	35,910	California	12/03/13	Facility	Equipment Failure	Land
Kerosene / jet fuel	33,600	California	02/15/10	Vessel	Organizational / man- agement Failure	Marine
Oily Water Mixture	33,600	California	11/09/14	Unknown	Unknown	Land
Oily water mixture	33,600	California	04/14/06	Pipeline	Equipment Failure	Impermeable Surface

continued on next page

Spills Greater than 10,000 Gallons -- continued

Product	Volume	State	Date	Source Type	Cause Type	Medium
Diesel Oil / Marine Gas Oil	32,000	California	01/25/13	Vehicle	External Conditions	Fresh Water
Oily Water Mixture	31,500	California	06/10/08	Facility	External Conditions	Land
Oily Water Mixture	31,500	California	12/03/09	Facility	Equipment Failure	Land
Oily Water Mixture	30,240	California	04/20/07	Facility	Equipment Failure	Land
Diesel Oil	30,000	Oregon	05/09/02	Other	External Conditions	Fresh Water
Oily Water Mixture	30,000	California	02/03/14	Vehicle	Other	Fresh Water
Crude Oil	29,400	California	10/01/06	Facility	Equipment Failure	Impermeable Surface
Gasoline	29,400	California	08/14/05	Pipeline	Human Error	Land
Gasoline	27,500	California	04/25/07	Vehicle	Equipment Failure	Land
Gasoline	27,000	Washington	03/23/12	Facility	Equipment Failure	Land
Jet fuel / Kerosene	27,000	Hawaii	01/13/14	Facility	Equipment Failure	Land
Crude Oil	26,460	California	01/30/06	Pipeline	Human Error	Land
Oily Water Mixture	26,250	California	06/17/09	Facility	Equipment Failure	Land
Crude Oil	26,250	California	06/11/08	Facility	Equipment Failure	Land
Crude Oil	25,200	California	11/24/12	Facility	Equipment Failure	Land
Crude Oil	25,200	California	11/27/05	Pipeline	Equipment Failure	Land
Diesel Oil	24,500	Washington	10/27/10	Facility	Equipment Failure	Land
Gasoline	24,500	Hawaii	10/06/04	Unknown	Equipment Failure	Land
Oily Water Mixture	24,360	California	05/09/14	Facility	Human Error	Land
Kerosene / Jet Fuel	24,000	Washington	03/01/05	Pipeline	Equipment Failure	Land
Kerosene / jet fuel	22,388	California	05/18/11	Vehicle	Unknown	Marine
Oily Water Mixture	21,546	California	06/27/08	Facility	Equipment Failure	Land
Crude Oil	21,336	California	06/01/10	Pipeline	Equipment Failure	Land
Oily Water Mixture	21,000	California	04/10/14	Facility	Equipment Failure	Land
Crude Oil	21,000	California	12/10/13	Pipeline	Unknown	Land
Unknown	21,000	Oregon	01/13/11	Vehicle	Equipment Failure	Land
Oily Water Mixture	21,000	California	07/11/08	Facility	Equipment Failure	Land
Diesel Oil	21,000	California	05/18/06	Pipeline	Equipment Failure	Land
Other	21,000	California	06/04/03	Facility	Equipment Failure	Marine
Crude Oil	21,000	California	11/06/06	Facility	Unknown	Land
Oily Water Mixture	21,000	California	03/29/07	Pipeline	Human Error	Land
Crude Oil	20,622	California	09/06/08	Facility	Equipment Failure	Land
Asphalt / Creosote	20,575	Washington	04/30/13	Facility	Human Error	Land
Oily Waste	20,000	Washington	11/13/14	Facility	Equipment Failure	Impermeable surface
Diesel Oil	20,000	California	12/08/09	Facility	Human Error	Land
Diesel Oil	20,000	California	11/07/12	Vessel	Organizational / management Failure	Marine
Asphalt / Creosote	20,000	Washington	10/06/14	Vehicle	Unknown	Land
Mineral Oil / Transformer Oil	20,000	Washington	03/25/13	Facility	Equipment Failure	Land
Diesel Oil / Marine Gas Oil	20,000	California	04/13/13	Vessel	Unknown	Marine
Diesel Oil	20,000	California	05/02/05	Pipeline	Equipment Failure	Land
Crude Oil	18,900	California	05/15/06	Facility	Human Error	Land
Gasoline	18,900	Hawaii	02/13/08	Facility	Human Error	Land
Diesel Oil	18,200	Washington	11/03/06	Facility	Equipment Failure	Land
Crude Oil	17,640	California	05/27/12	Facility	Equipment Failure	Land

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Spills Greater than 10,000 Gallons -- *continued*

Product	Volume	State	Date	Source Type	Cause Type	Medium
Bunker C / IFO / HFO	17,000	California	09/14/11	Private Property	Equipment Failure	Marine
Crude Oil	16,800	California	10/13/06	Pipeline	Equipment Failure	Land
Gasoline	16,800	California	03/24/06	Vehicle	Unknown	Land
Crude Oil	16,800	California	06/02/06	Facility	Equipment Failure	Impermeable Surface
Bunker C / IFO / HFO	16,800	California	08/07/07	Facility	Equipment Failure	Land
Oily Water Mixture	16,800	California	04/09/14	Facility	Equipment Failure	Land
Crude Oil	16,800	California	12/03/09	Facility	Equipment Failure	Land
Waste Oil	15,750	Washington	06/12/06	Facility	Equipment Failure	Land
Diesel Oil	15,000	Washington	08/01/08	Facility	Equipment Failure	Impermeable Surface
Diesel Oil	15,000	Oregon	10/31/05	Facility	Human Error	Fresh Water
Crude Oil	14,700	California	03/02/14	Unknown	Unknown	Land
Other	14,700	California	12/04/04	Pipeline	Equipment Failure	Fresh Water
Diesel Oil	14,680	Alaska	12/08/04	Vessel	Human Error	Marine
Edible / Vegetable Oil	14,400	California	04/08/13	Facility	Human Error	Land
Oily Water Mixture	14,070	California	07/29/07	Facility	Human Error	Land
Oily water mixture	14,000	California	09/16/06	Pipeline	Equipment Failure	Land
Crude Oil	14,000	California	03/07/03	Pipeline	Equipment Failure	Land
Diesel Oil	14,000	Hawaii	11/01/11	Vessel	Equipment Failure	Land
Oily Water Mixture	13,659	California	01/10/07	Facility	Equipment Failure	Land
Kerosene / jet fuel	13,630	Alaska	10/30/08	Facility	Equipment Failure	Land
Bunker C / IFO / HFO	13,524	Washington	04/07/05	Facility	Human Error	Land
Crude Oil	13,500	Alaska	11/29/09	Facility	Equipment Failure	Land
Oily Water Mixture	13,440	California	01/21/07	Facility	External Conditions	Land
Diesel Oil	13,000	Hawaii	07/20/06	Vessel	Equipment Failure	Marine
Asphalt / Creosote	13,000	Oregon	08/11/04	Vehicle	Equipment Failure	Land
Mineral oil / Transformer oil	13,000	Hawaii	03/22/07	Vessel	Equipment Failure	Marine
Crude Oil	12,852	California	06/28/10	Facility	Equipment Failure	Fresh Water
Oily Water Mixture	12,684	California	04/03/08	Facility	Equipment Failure	Land
Oily Water Mixture	12,600	California	10/15/12	Facility	Equipment Failure	Land
Oily Water Mixture	12,600	California	10/12/07	Pipeline	Equipment Failure	Land
Crude Oil	12,600	California	11/09/14	Unknown	Unknown	Land
Oily Water Mixture	12,600	California	12/03/09	Facility	Equipment Failure	Land
Asphalt / creosote	12,600	California	11/13/09	Facility	Human Error	Land
Crude Oil	12,600	California	07/15/07	Facility	Equipment Failure	Land
Crude Oil	12,600	California	11/26/07	Facility	Equipment Failure	Land
Oily water mixture	12,600	Alaska	01/29/07	Facility	Equipment Failure	Land
Diesel Oil	12,248	Alaska	04/24/05	Facility	Human Error	Land
Other/Unknown	12,118	Alaska	12/18/02	Facility	Other	Land
Mineral oil / Transformer oil	12,096	California	09/30/07	Pipeline	Equipment Failure	Land
Diesel Oil	12,045	Alaska	01/19/12	Facility	Human Error	Impermeable Surface
Crude Oil	12,012	California	06/28/12	Facility	Equipment Failure	Land
Crude Oil	12,000	California	03/15/07	Facility	Equipment Failure	Land
Oily Water Mixture	11,970	California	05/01/07	Pipeline	Equipment Failure	Land
Oily Water Mixture	11,760	California	12/10/13	Facility	Unknown	Land
Crude Oil	11,676	California	03/04/06	Facility	Equipment Failure	Land

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Spills Greater than 10,000 Gallons -- continued

Product	Volume	State	Date	Source Type	Cause Type	Medium
Other/Unknown	11,611	Alaska	02/26/02	Facility	Other	Land
Gasoline	11,000	Oregon	12/02/02	Vehicle	Human Error	Fresh Water
Diesel Oil	11,000	Alaska	11/17/03	Facility	Human Error	Land
Gasoline	11,000	Washington	11/27/03	Vehicle	Unknown	Fresh Water
Gasoline	11,000	Washington	03/23/09	Vehicle	Human Error	Land
Diesel Oil	10,584	Hawaii	08/05/05	Pipeline	Equipment Failure	Land
Oily Water Mixture	10,500	California	04/11/08	Facility	Human Error	Land
Oily water mixture	10,500	California	05/29/06	Pipeline	Equipment Failure	Fresh Water
Oily water mixture	10,500	California	08/12/06	Pipeline	Equipment Failure	Land
Other	10,500	Washington	09/13/07	Facility	Human Error	Land
Asphalt / Creosote	10,080	California	02/13/13	Facility	Equipment Failure	Land
Oily Water Mixture	10,080	California	09/29/14	Unknown	Unknown	Land
Crude Oil	10,080	California	07/21/08	Pipeline	Equipment Failure	Land

2002-2014

Summary by Product

- Over the 13-year period, the combined volume of Non-Crude spills was more than 2.5 times that for Crude Oil spills.

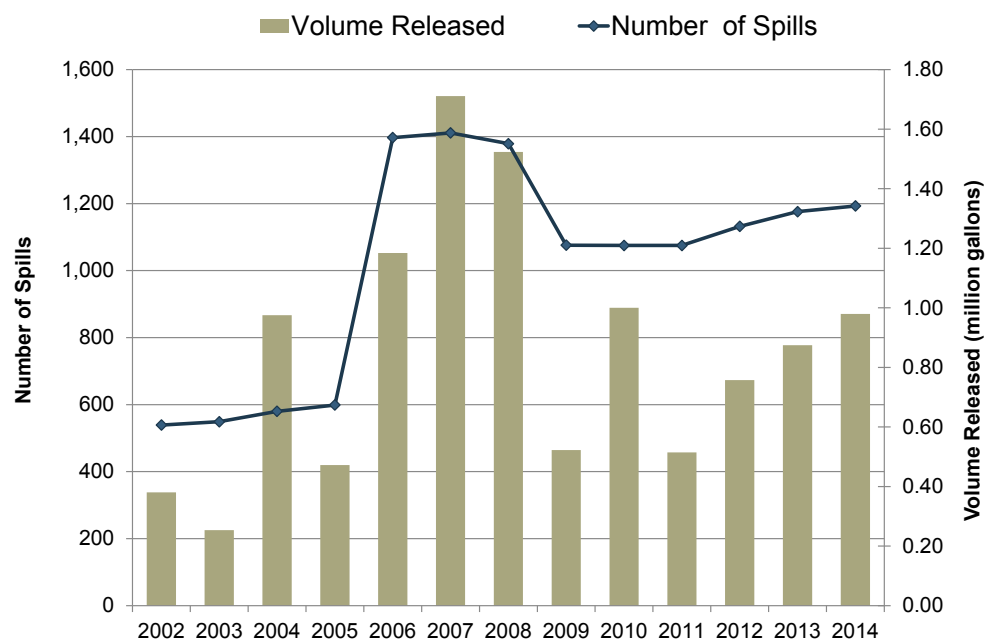
Crude Oil Spills

- The top two Crude Oil spills during the 13-year period were 463,848 gallons in California (2008) and a 267,000 gallon spill in Alaska (2006). The combined volume of these two incidents comprised 25% of the total Crude Oil volume released for the period.

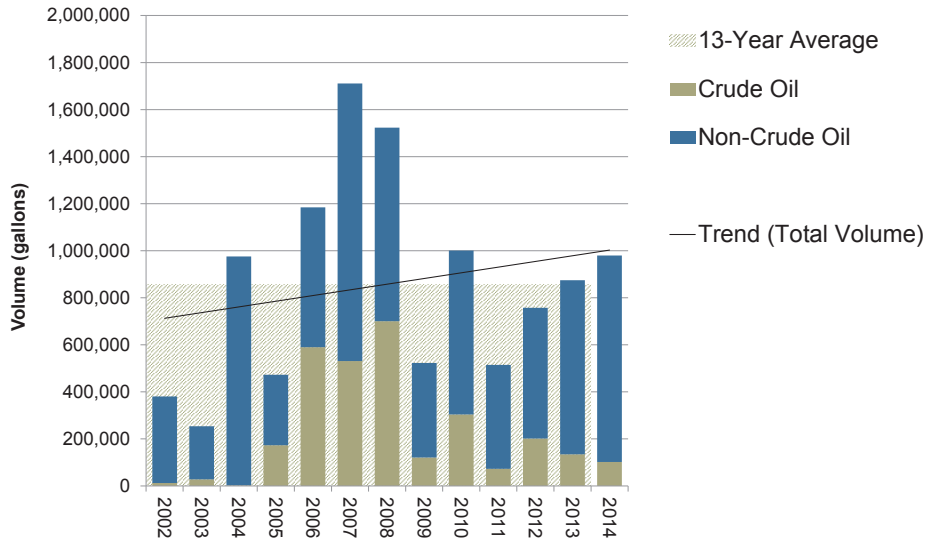
Crude vs. Non-Crude Spills by Year (2002-2014)

Year	Non-Crude Oil		Crude Oil		Total	
	Spill Count	Gallons	Spill Count	Gallons	Spill Count	Gallons
2002	516	367,909	23	12,769	539	380,678
2003	533	225,721	16	28,015	549	253,736
2004	573	973,545	7	2,092	580	975,637
2005	580	299,516	19	172,871	599	472,387
2006	1,155	594,280	242	589,867	1,397	1,184,147
2007	1,202	1,179,964	209	530,918	1,411	1,710,882
2008	1,154	823,197	225	700,297	1,379	1,523,494
2009	942	401,591	134	120,972	1,076	522,563
2010	946	696,557	129	303,808	1,075	1,000,365
2011	947	441,790	128	73,004	1,075	514,794
2012	1,007	555,494	125	201,812	1,132	757,306
2013	1,081	740,141	95	134,692	1,176	874,833
2014	1,103	877,942	90	101,713	1,193	979,655
13-YR Total	11,739	8,177,647	1,442	2,972,830	13,181	11,150,477
13-YR AVG	903	629,050	111	228,679	1,014	857,729

Number of Spills and Volume Released (2002-2014)



Crude vs. Non-Crude Spills (2002-2014)



2002-2014

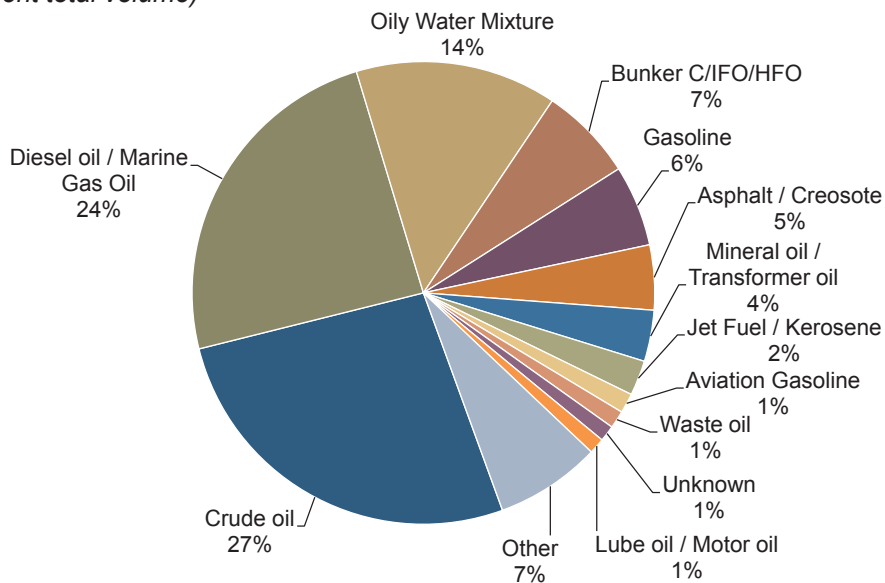
Non-Crude Oil Spills

(see graph on following page)

- Diesel Oil/Marine Gas Oil comprised 24% of the total spill volume and 33% of the Non-Crude spill volume for the period.

Spills by Product (2002-2014)

(percent total volume)



NOTE: "Other" includes products comprising 1% or less of the total volume released: Hydraulic oil, Heating oil, Edible/Vegetable Oil, Oily Waste, LNG/LPG

2002-2014

Summary by Source

- Overall, Facilities (53%) and Pipelines (19%) were the major sources of spills during the 13-year period.
- Facilities were the source of 55% of the Non-Crude spill volume.
- Pipelines (51%) and Facilities (46%) were the major sources of Crude Oil spills.

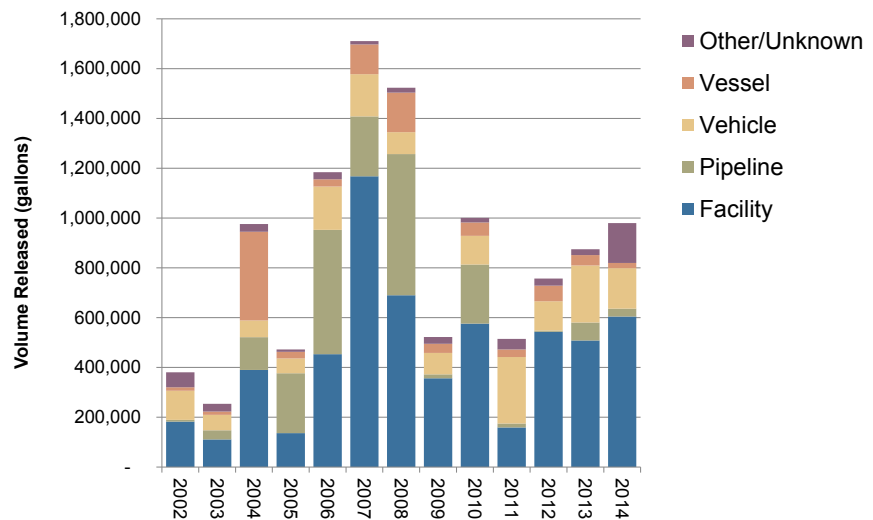
Non-Crude Oil Spill Sources

Source	gallons
Facility	4,517,591
Vehicle	1,680,572
Vessel	959,838
Pipeline	573,611
Other/Unknown	432,635
Military	7,710
Public Lands	5,190
Farm/Agriculture	500
Total	8,177,647

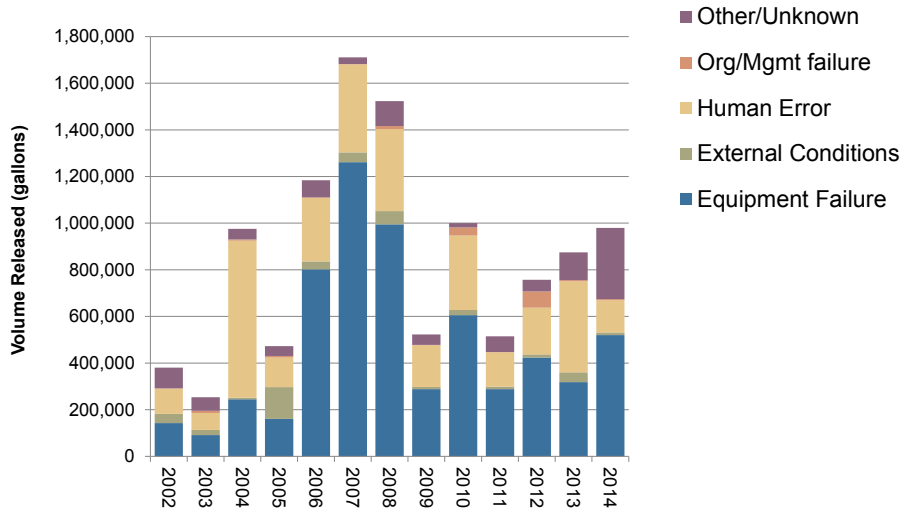
Crude Oil Spill Sources

Source	gallons
Pipeline	1,527,799
Facility	1,360,096
Other/Unknown	47,157
Vehicle	32,444
Vessel	5,334
Total	2,972,830

Annual Spill Volume by Source (2002-2014)



Annual Spill Volume by Cause (2002-2014)



2002-2014

Summary by Cause

- Overall, Equipment Failure (55%) and Human Error (30%) were the major spill causes.
- Equipment Failure (47%) and Human Error (38%) were the predominant causes for Non-Crude spills
- 78% of the total Crude Oil spill volume was due to Equipment Failure.

Non-Crude Oil Spills

Cause	gallons
Equipment Failure	3,822,436
Human Error	3,103,042
Other/Unknown	859,567
External Conditions	287,189
Organizational / Management Failure	105,413
Total	8,177,647

Crude Oil Spills

Cause	gallons
Equipment Failure	2,320,518
Human Error	255,021
Other/Unknown	190,594
External Conditions	158,796
Organizational / management Failure	47,901
Total	2,972,830