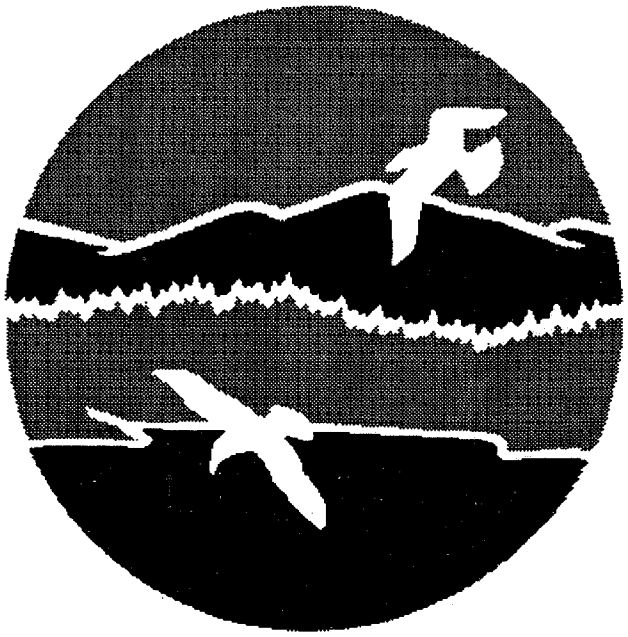
STATEWIDE

Statistical Report of the Division of Response Services' Case Load for 1988 in The Bureau of Oil & Hazardous Material Control MDEP



Compiled by :
Lyle S. Hall, ES II

Division of Response Services
Bureau of Oil & Hazardous Material Control
Department of Environmental Protection

With Assistance from
Marcia Arnold, Conservation Aide

INDEX - 1988 Report

INTRODUCTION

This report is the "Statewide Statistical Report of the Division of Response Services Case Load for 1988." Response services division in the Bureau of Oil and Hazardous Material Control (BOHMC) responds to oil and hazardous material spills throughout the state and acts to mitigate the damage of these events to our state's environment, public safety and public health. The Division of Response Services in 1988 consisted of twenty-one (21) Oil and Hazardous Material Control Specialists or OHMSs, two (2) Environmental Specialists and one (1) Division Director. These twenty-four personnel filed one thousand eight hundred and five (1,805) reports dealing with oil and hazardous materials incidents and investigations throughout the state of Maine. A sumarization of this activity follows. This statistical report examines Response Services' activity from a variety of perspectives in an attempt to highlight both Maine's environmental concerns and the kinds and numbers of situations Response Services' personnel handle.

In examining.this report, it is important to remember that a Response report must be related to a product which is either oil or Hazardous Material and that a report can be either :

1) An incident (a known or unknown product **was released to the environment**) or
2) An investigation (a known or unknown product was reported to have been released to the environment, but upon investigation none could be found or the product found did not meet the criteria of an oil or hazardous waste and so did not fall within this divisions jurisdiction).

In general, comments have been kept to a minimum as most of the presentations require no explanation, some graphs do have explanations attached in front of them to help the reader interpret the information presented. There are also a few standardizations the reader should be aware of, office names are on occaision abbreviated.

A - Augusta
B - Bangor
P.I. - Presque Isle
S.P. - South Portland

Abbreviations are also used with Incidents/Investigations and Hazardous Material.

Inc - Incident
Inv - Investigation
Haz - Hazardous
Mat - Materials

NOTE : Sixty-eight wells were contaminated in 1988. This is an decrease of approximately 35% over last year. However, the three year total of wells contaminated is 263. This means that, statistically speaking, over half of Maine's 400 communities could contain at least one contaminated groundwater source.

Personnel Responsible for Writting Reports in 1988

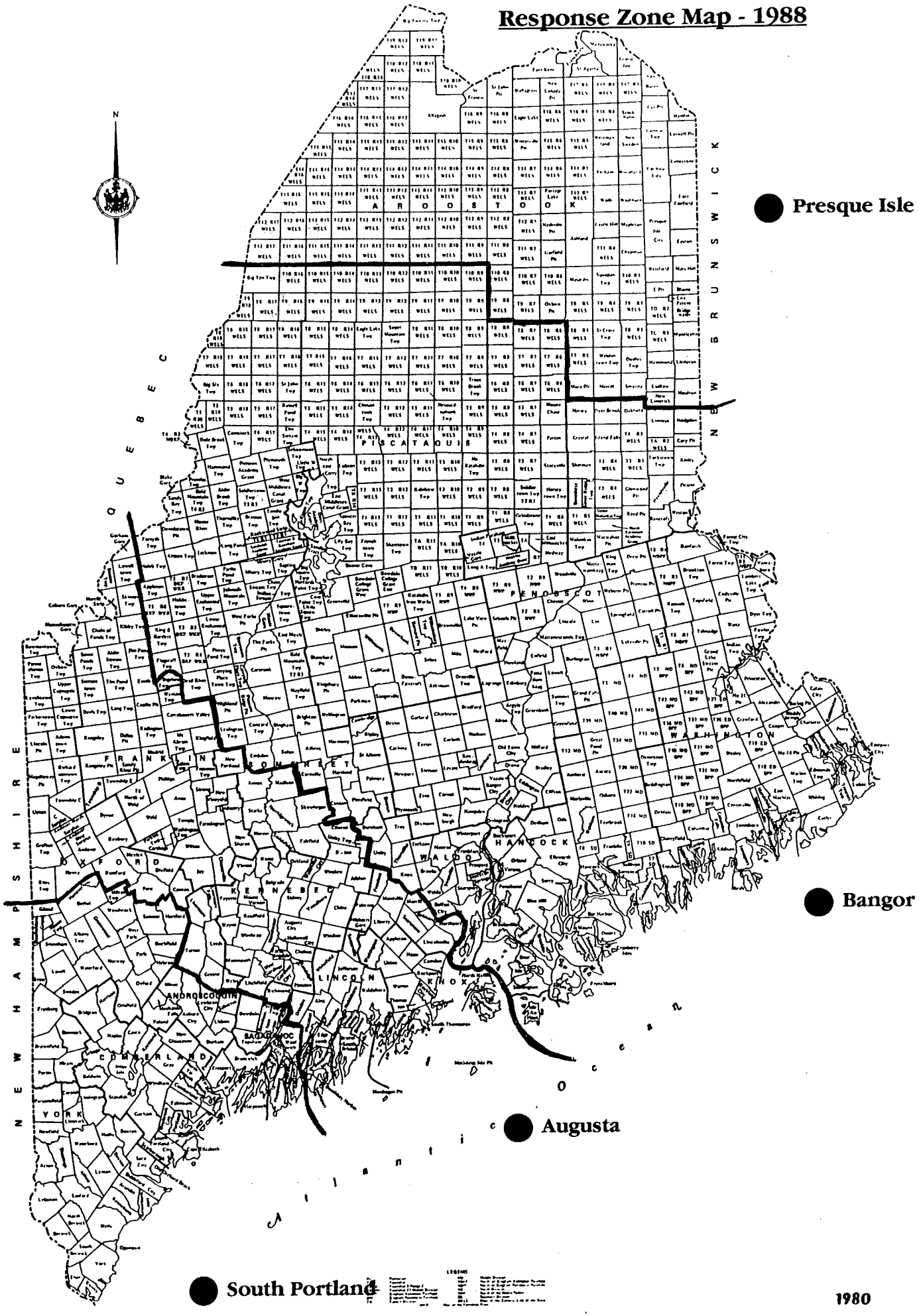
Name	Position	Location
David Sait	Division Director	Augusta
Perry Cogburn	OHMS III	"
Fred Brann	OHMS II	"
Denny Phillips	OHMS II	"
Jim Pray	OHMS I	"
Al McNeilly	OHMS I	"
Glenn Wall	OHMS I	"
Lyle Hall	ES II	"
Robert Randall	OHMS III	Bangor
Tom Varney	OHMS II	"
Tom Maleck	OHMS I	"
Cleve Leckey	OHMS I	"
Barbara Taylor	OHMS I	"
Darryl Luce	OHMS I	"
Jake Ward	ES II	"
Carl Allen	OHMS I	Presque Isle
Frank Wezner	OHMS I	"
Steven Eufemia	OHMS III	South Portland
James Daye	OHMS II	"
Ed Antz	OHMS I	"
Mark St. Germaine	OHMS I	"
John Gordon	OHMS I	"
Steve Brezinski	OHMS I	"
Bradford Hahn	OHMS I	"

Regional Office Telephone Numbers :

Augusta	289-2651
Bangor	941-4570
Presque Isle	764-2044
South Portland	767-4761

State wide 24 Hour Emergency Oil Spill Hotline 1-800-482-0777

Response Zone Map - 1988

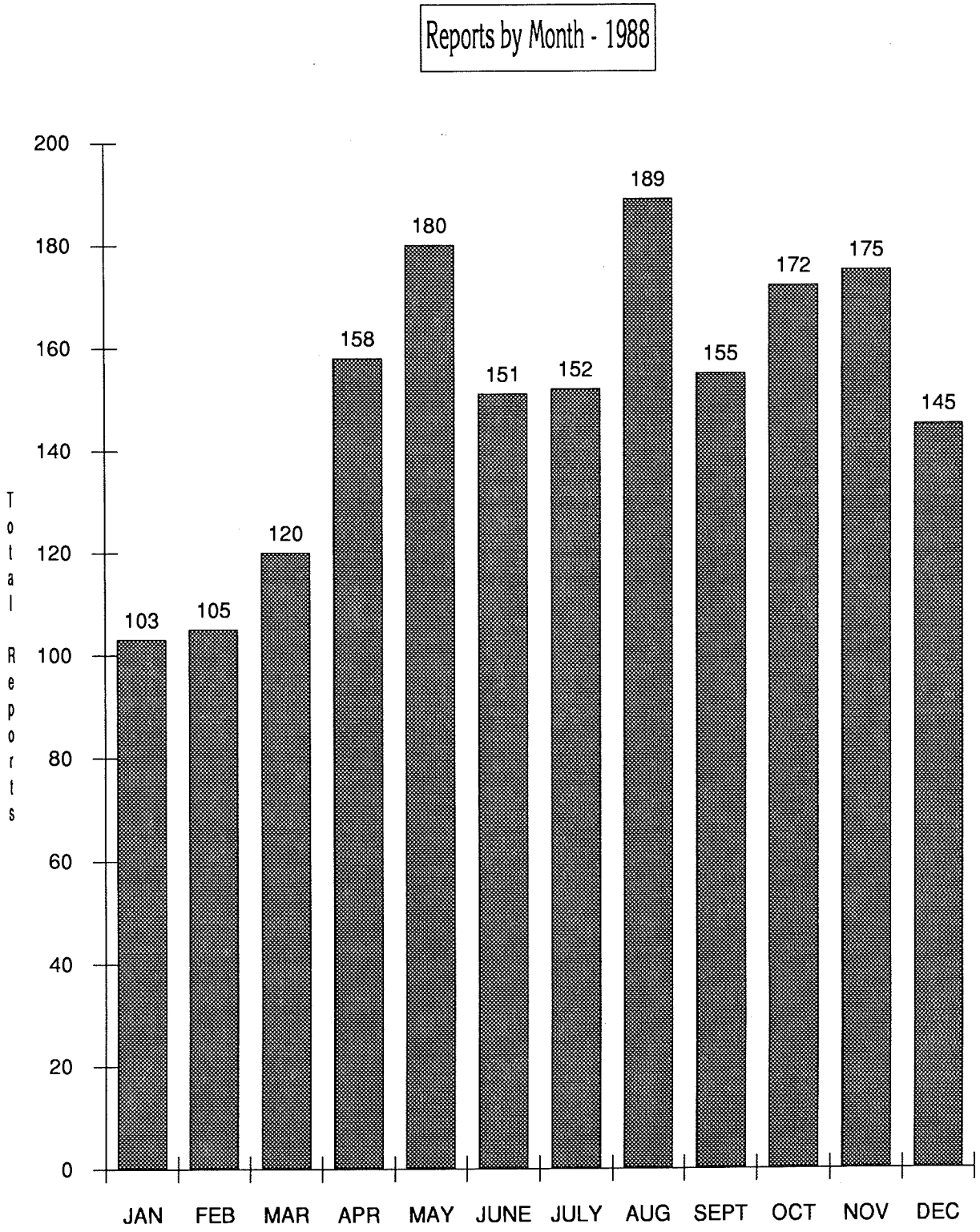


Maine Department of Environmental Protection

Division of Response Services

A Break Down, by Month, of Reports in 1988

Month	Number of Reports
January	**103**
Feruary	**105**
March	**120**
April	**158**
May	**180**
June	**151**
July	**152**
August	**189**
September	**155**
October	**172**
November	**175**
December	**145**
Total	**1805**

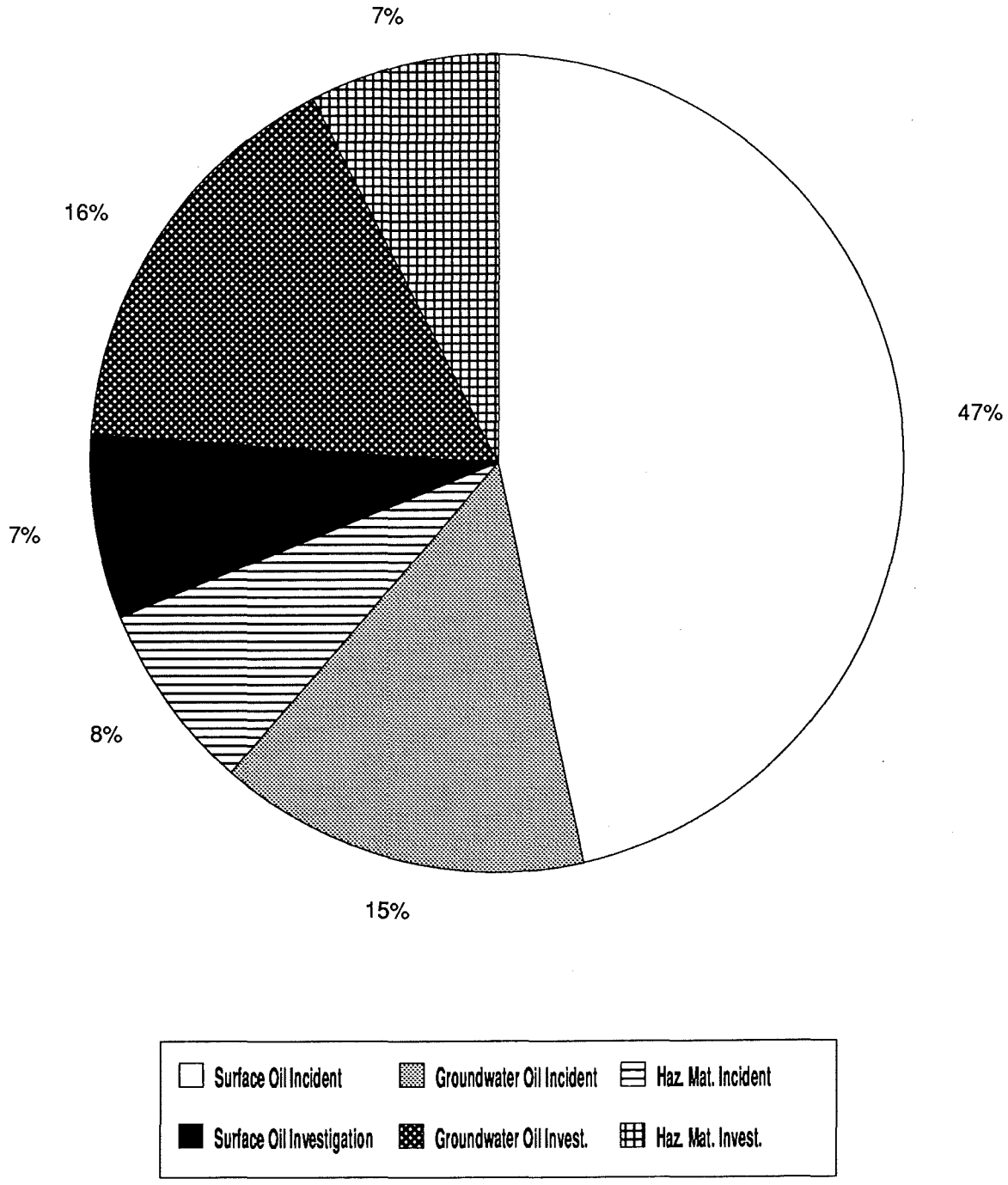

Reports by Month - 1988
Total Reports
200
180
160
140
120
100
80
60
40
20
0
103
105
120
158
180
151
152
189
155
172
175
145
JAN
FEB
MAR
APR
MAY
JUNE
JULY
AUG
SEPT
OCT
NOV
DEC

A Listing, by Response Office, of the Number of Oil Vs Hazardous Material Reports Broken Down By Incident & Investigation Types - for 1988

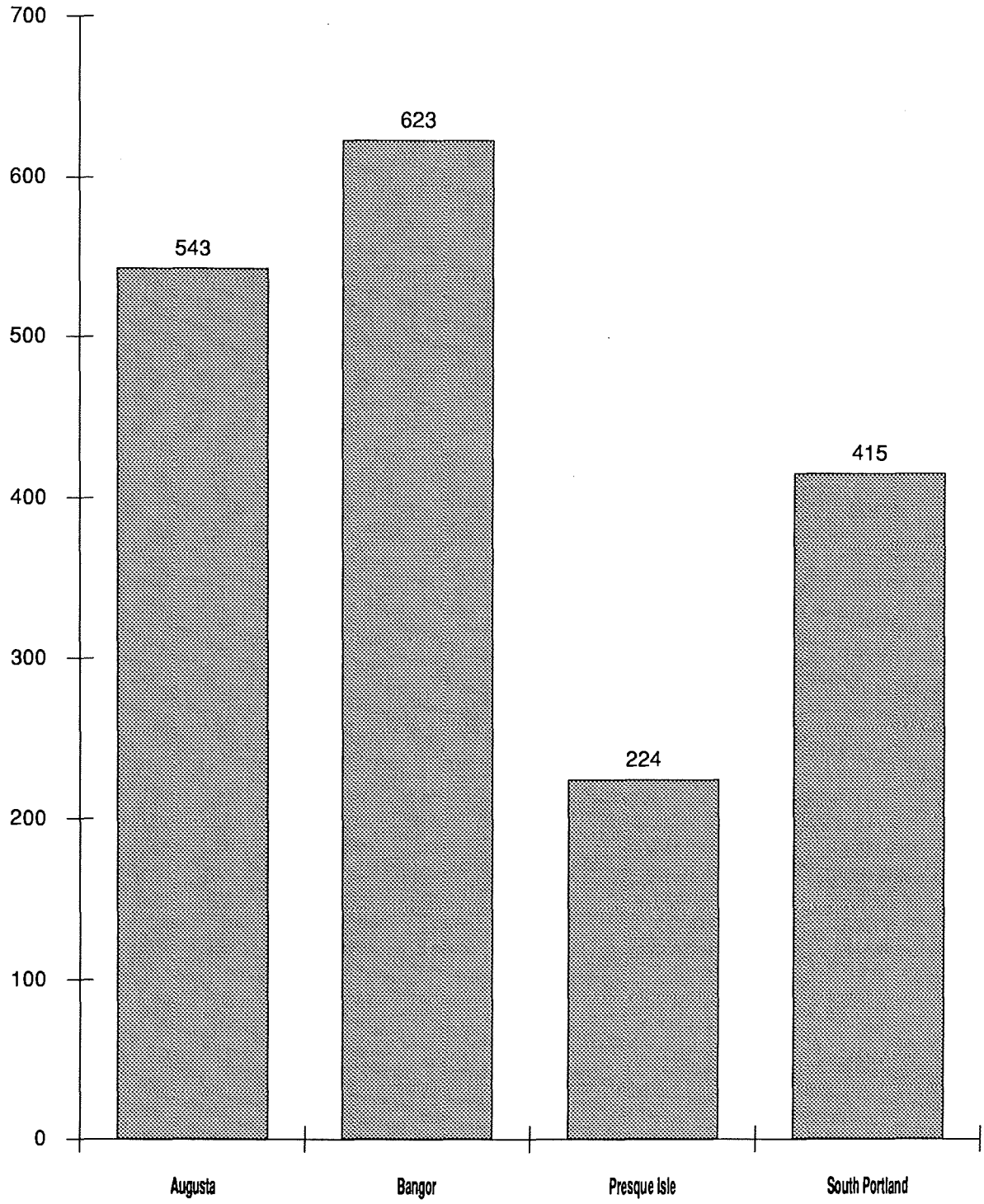
Office	Type	Number of Reports	Percent of Reports
Augusta	Surface Oil Incident	224	41%
	Groundwater Oil Incident	74	14%
	Haz. Mat. Incident	46	8%
	Surface Oil Investigation	57	10%
	Groundwater Oil Invest.	107	20%
	Haz. Mat. Invest.	35	6%
	Office Total	**543**	
Bangor	Surface Oil Incident	301	48%
	Groundwater Oil Incident	114	18%
	Haz. Mat. Incident	48	8%
	Surface Oil Investigation	36	6%
	Groundwater Oil Invest.	63	10%
	Haz. Mat. Invest.	61	10%
	Office Total	**623**	
Presque Isle	Surface Oil Incident	79	35%
	Groundwater Oil Incident	12	5%
	Haz. Mat. Incident	18	8%
	Surface Oil Investigation	10	4%
	Groundwater Oil Invest.	83	37%
	Haz. Mat. Invest.	22	10%
	Office Total	**224**	
South Portland	Surface Oil Incident	243	59%
	Groundwater Oil Incident	62	15%
	Haz. Mat. Incident	25	6%
	Surface Oil Investigation	29	7%
	Groundwater Oil Invest.	42	10%
	Haz. Mat. Invest.	14	3%
	Office Total	**415**	
	Grand Total All Offices	**1805**	

Totals of Types for All Offices		
Surface Oil Incident	847	47%
Groundwater Oil Incident	262	15%
Haz. Mat. Incident	137	8%
Surface Oil Investigation	132	7%
Groundwater Oil Invest.	295	16%
Haz. Mat. Invest.	132	7%

Oil & Hazardous Material Incident Vs Investigation Types - 1988



BOHMC - Number of Response Services Reports Filed by Office - 1988



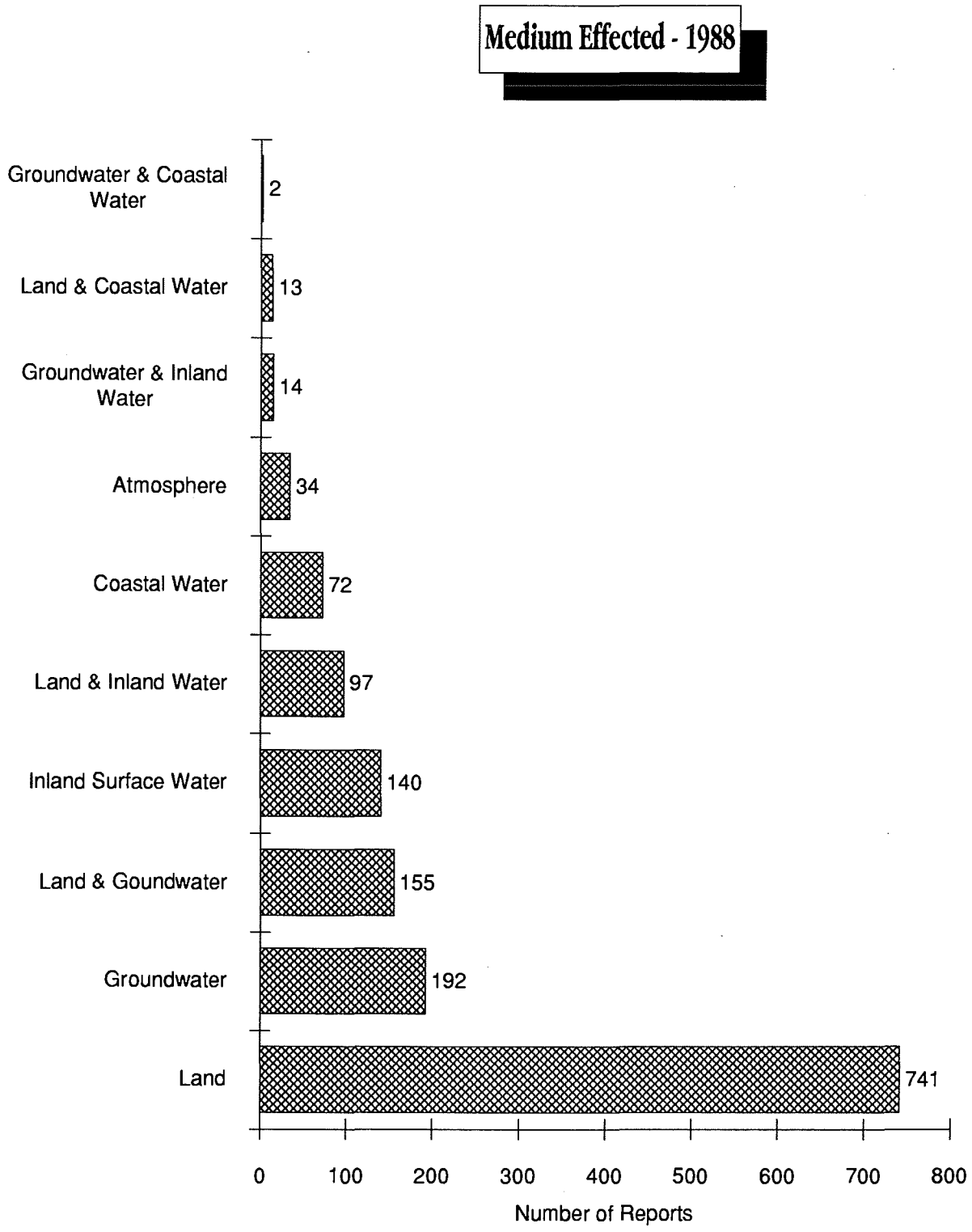
Graph compares each Regional Office's share of the 1805 reports filed

Response Services - BOHMC

Reports Broken Down by Medium Effected

for 1988

Medium Effected	Field Offices				Medium Tally
	A	B	P. I.	S. P.	
Atmosphere	17	9	5	3	34
Coastal Water	22	26	0	24	72
Groundwater	43	46	55	48	192
Inland Surface Water	54	36	20	30	140
Land	229	259	83	170	741
Data Not available	0	0	2	0	2
None	105	140	50	48	343
Land & Coastal Water	0	8	0	5	13
Land & Inland Water	24	38	5	30	97
Groundwater & Coastal Water	0	1	0	1	2
Groundwater & Inland Water	2	8	1	3	14
Land & Goundwater	47	52	3	53	155
Office Tally	**543**	**623**	**224**	**415**	**1805**


Medium Effected - 1988
Groundwater & Coastal Water
2
Land & Coastal Water
13
Groundwater & Inland Water
14
Atmosphere
34
Coastal Water
72
Land & Inland Water
97
Inland Surface Water
140
Land & Goundwater
155
Groundwater
192
Land
741
0
100
200
300
400
500
600
700
800
Number of Reports

The following two pages deal with man hour expenditures of the Division of Response Services, during 1988. You will note, Oil Incidents make up the majority of our work load. Surface oil spills are reported or come to our attention three to four times as often as groundwater oil spills. However, the potential for damage when groundwater becomes contaminated is far greater, in general, than that of surface spills. Soil after all generally acts as a barrier to the movement of contaminants, whereas groundwater helps dissolve and spread them. Further our society values the concept of "clean". The uses we put water to in the pursuit of "clean" are vast indeed and as a result when the groundwater we use becomes contaminated we are very likely to come in contact with those contaminants.

A close examinatinion of the data reveals that, in 1988, groundwater spills generated two and a half times as many man hours per event. That is to say if an OHMS spends **2 hours** on an average surface oil spill he/she will spend **5 hours** on the average groundwater spill event. It is important to remember these statistics take into consideration only the first year of a groundwater spill.

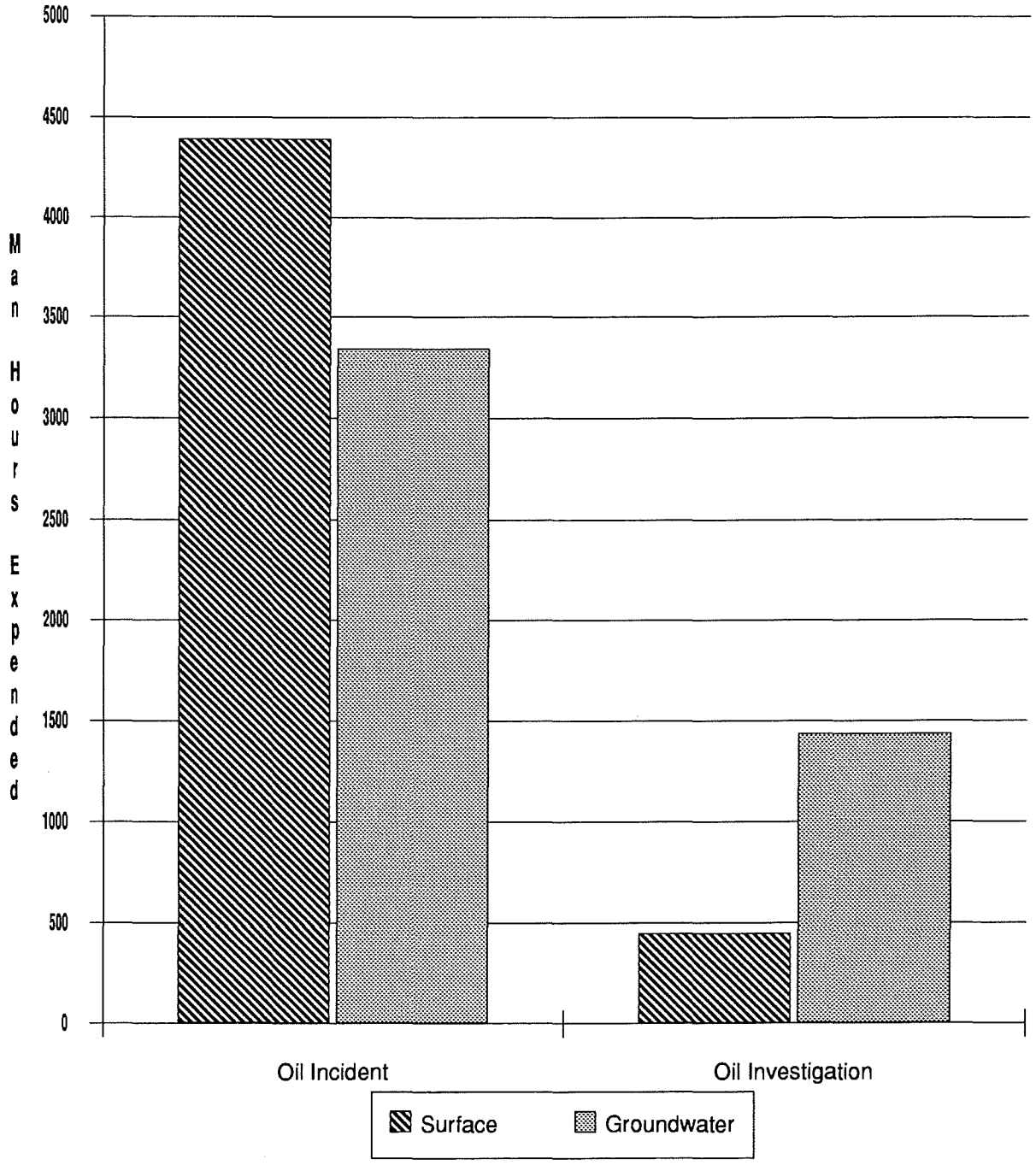
Normally a surface spill is cleaned up and done with in the first year. Groundwater spills in contrast require a good deal of follow-up time in later years. Groundwater recovery systems can often only be run in the spring to fall, since most recovery systems require pumping contaminated water out of the ground for treatment. In the winter months, the water freezes in the recovery unit and clogs the system or bursts its piping. Warm weather operation of groundwater recovery equipment is not without incident either. Most microorganisms like oxygen and carbon. In a recovery system both are often present, this makes filters and air strippers magnificent breeding ground for bacteria. All these quick breeding bacteria eventually clog the recovery unit and it has to be cleaned, requiring further man hour expenditures.

These factors and others make the clean up of groundwater a cost intensive undertaking in many ways. Fresh, clean water is a basic requirement for life on earth, not just wildlife but human life. **Therefore these costs must be taken into consideration when industry or the private sector seek to avoid the installation of leak detection and *more importantly* leak prevention equipment.** Experience indicates that in the world of groundwater protection, a dollars worth of prevention is worth a thousand dollars of cure.

Man Hours expended on Oil vs Hazardous Materials Incidents Reports and Investigations Separated by Groundwater vs Surfacewater

Office	Report Type	Number of Reports	Hours	Ratio of Hours/Report
Augusta	Surface Oil Incident	224	1,086.70	5
	Groundwater Oil Incident	74	867.90	12
	Haz. Mat. Incident	46	621.90	
	Surface Oil Investigation	57	172.00	
	Groundwater Oil Invest.	107	544.40	
	Haz. Mat. Invest.	35	157.50	
Bangor	Surface Oil Incident	301	1,702.00	6
	Groundwater Oil Incident	114	1,280.90	11
	Haz. Mat. Incident	49	231.00	
	Surface Oil Investigation	36	153.50	
	Groundwater Oil Invest.	63	367.00	
	Haz. Mat. Invest.	60	475.50	
Presque Isl.	Surface Oil Incident	79	291.40	4
	Groundwater Oil Incident	12	113.50	9
	Haz. Mat. Incident	21	108.50	
	Surface Oil Investigation	10	45.00	
	Groundwater Oil Invest.	83	370.00	
	Haz. Mat. Invest.	19	110.50	
S. Portland	Surface Oil Incident	243	1,310.90	5
	Groundwater Oil Incident	62	1,078.30	17
	Haz. Mat. Incident	25	98.50	
	Surface Oil Investigation	29	78.00	
	Groundwater Oil Invest.	42	152.30	
	Haz. Mat. Invest.	14	76.50	
	Totals for all Offices	**1805**	**11,493.70**	

BOHMC Response Services - Total Man Hours Expended in all Offices for 1988



Reports in 1988 Broken Down by Cause of Spill

AUGUSTA

Cause of Spill	Number of Spills
No Cause Apparent	89
External Corrosion(tank)	33
Internal Corrosion (tank)	11
Piping Corrosion	6
Corrosion other	2
Physical Breakage	22
Piping or Hose Fialure	47
Valve Failure	9
Loose Fitting	16
Overfill (tank or Vessel)	42
Bilge Discharge	1
Accident	40
Sunken Vessel	2
Containment Unit Sunken	0
Accident other	28
Storm Damage	7
Poor Workmanship	8
Human Error	27
Unknown	121
Vandalism	9
Deliberate Discharge	23
Total	***543***

BANGOR

No Cause Apparent	135
External Corrosion(tank)	26
Internal Corrosion (tank)	19
Piping Corrosion	14
Corrosion other	6
Physical Breakage	44
Piping or Hose Fialure	30
Valve Failure	11
Loose Fitting	17
Overfill (tank or Vessel)	41
Bilge Discharge	4
Accident	49
Sunken Vessel	2
Containment Unit Sunken	0
Accident other	32
Storm Damage	4
Poor Workmanship	2
Human Error	67
Unknown	95
Vandalism	7
Deliberate Discharge	18
Total	***623***

Reports in 1988 Broken Down by Cause of Spill

PRESQUE ISLE

Cause of Spill	Number of Spills	
No Cause Apparent	71	
External Corrosion(tank)	7	
Internal Corrosion (tank)	1	
Piping Corrosion	1	
Corrosion other	3	
Physical Breakage	24	
Piping or Hose Fialure	7	
Valve Failure	9	
Loose Fitting	2	
Overfill (tank or Vessel)	17	
Bilge Discharge	0	
Accident	16	
Sunken Vessel	0	
Containment Unit Sunken	0	
Accident other	4	
Storm Damage	2	
Poor Workmanship	3	
Human Error	11	
Unknown	26	
Vandalism	1	
Deliberate Discharge	19	
Total		***224***

SOUTH PORTLAND

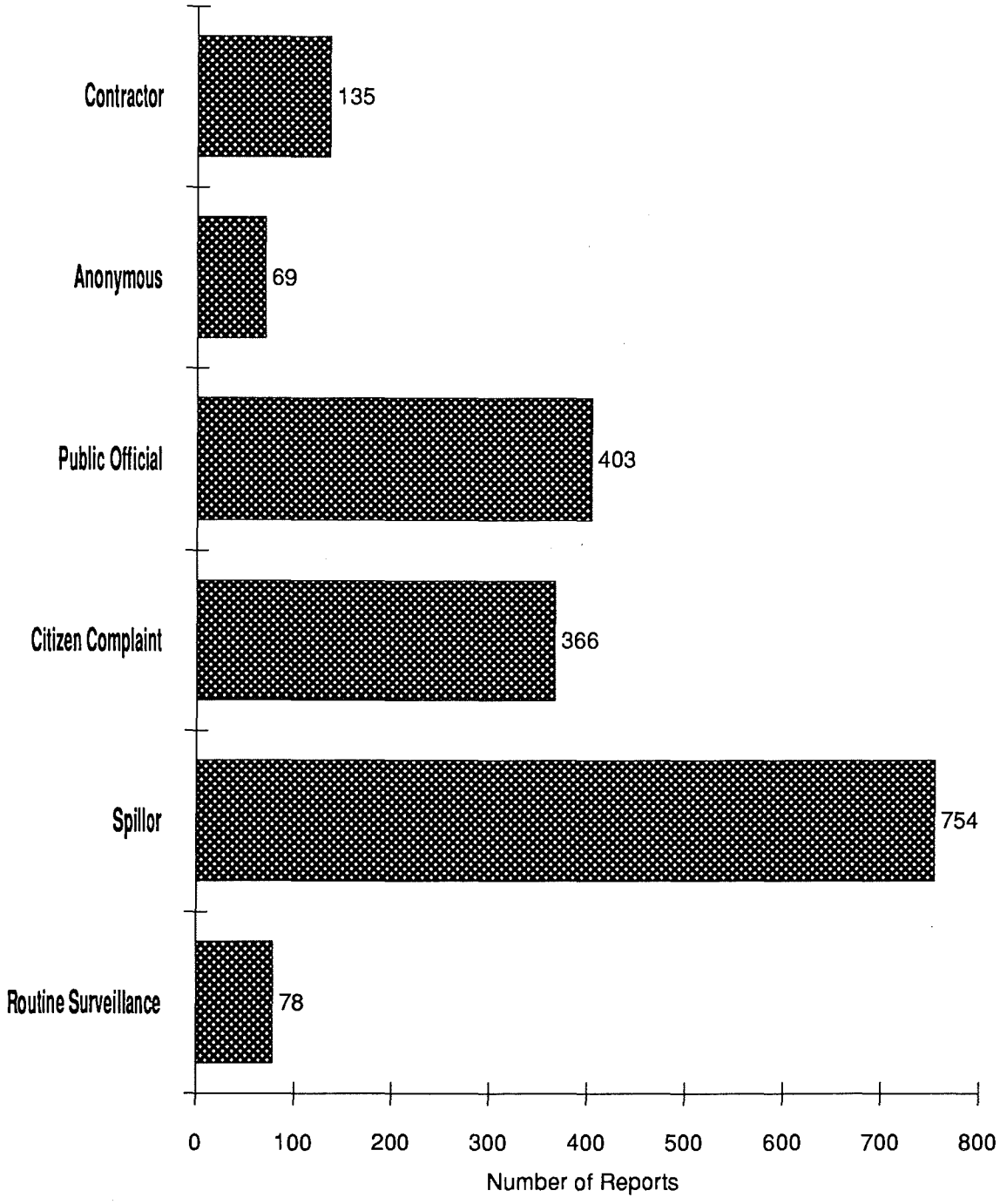
No Cause Apparent	60	
External Corrosion(tank)	36	
Internal Corrosion (tank)	1	
Piping Corrosion	4	
Corrosion other	7	
Physical Breakage	16	
Piping or Hose Fialure	30	
Valve Failure	5	
Loose Fitting	7	
Overfill (tank or Vessel)	28	
Bilge Discharge	1	
Accident	52	
Sunken Vessel	3	
Containment Unit Sunken	0	
Accident other	19	
Storm Damage	4	
Poor Workmanship	7	
Human Error	57	
Unknown	48	
Vandalism	6	
Deliberate Discharge	24	
Total		***415***

Grand Total All Reports ***1805***

Spills by Method of Detection for 1988

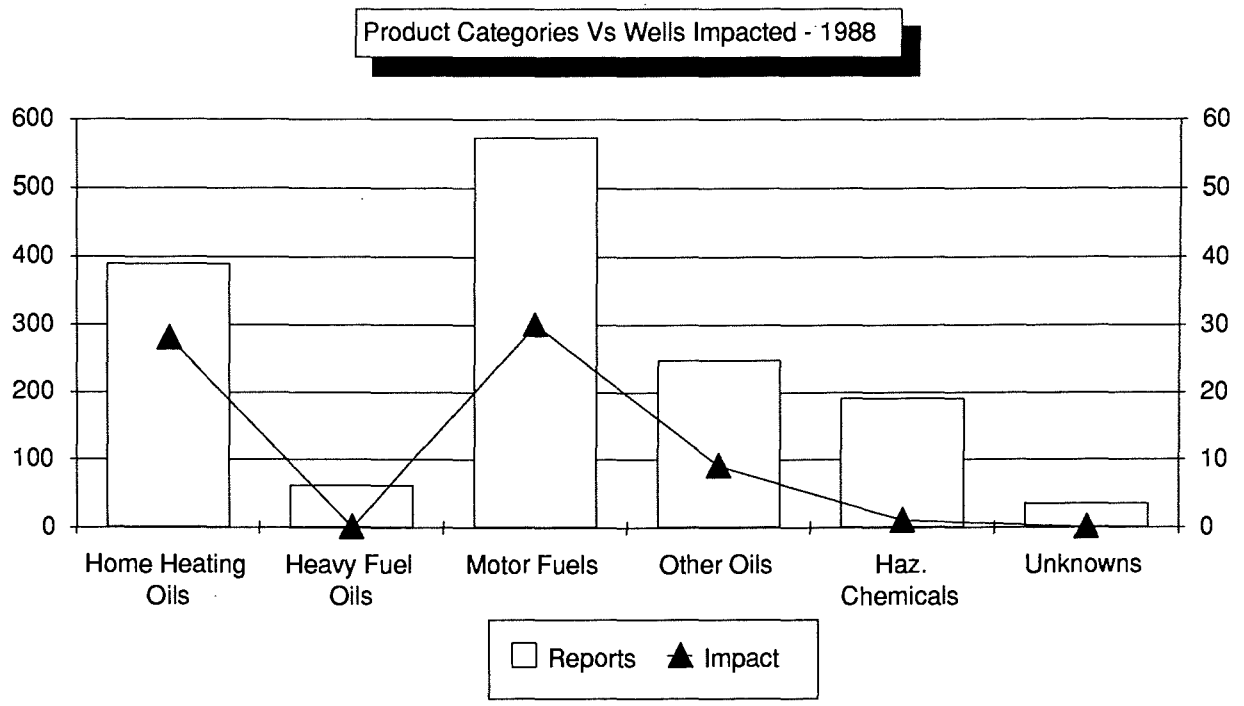
Office	Method of Detection	Number of Reports
Augusta	Routine Surveillance	16
	Spillor	247
	Citizen Complaint	115
	Public Official	101
	Anonymous	18
	Contractor	46
	Office Total	543
Bangor	Routine Surveillance	6
	Spillor	261
	Citizen Complaint	114
	Public Official	156
	Anonymous	35
	Contractor	51
	Office Total	623
Presque Isle	Routine Surveillance	11
	Spillor	111
	Citizen Complaint	48
	Public Official	45
	Anonymous	6
	Contractor	3
	Office Total	224
South Portland	Routine Surveillance	45
	Spillor	135
	Citizen Complaint	89
	Public Official	101
	Anonymous	10
	Contractor	35
	Office Total	415

Reports by Method of Detection 1988



Products Spilled - 1988

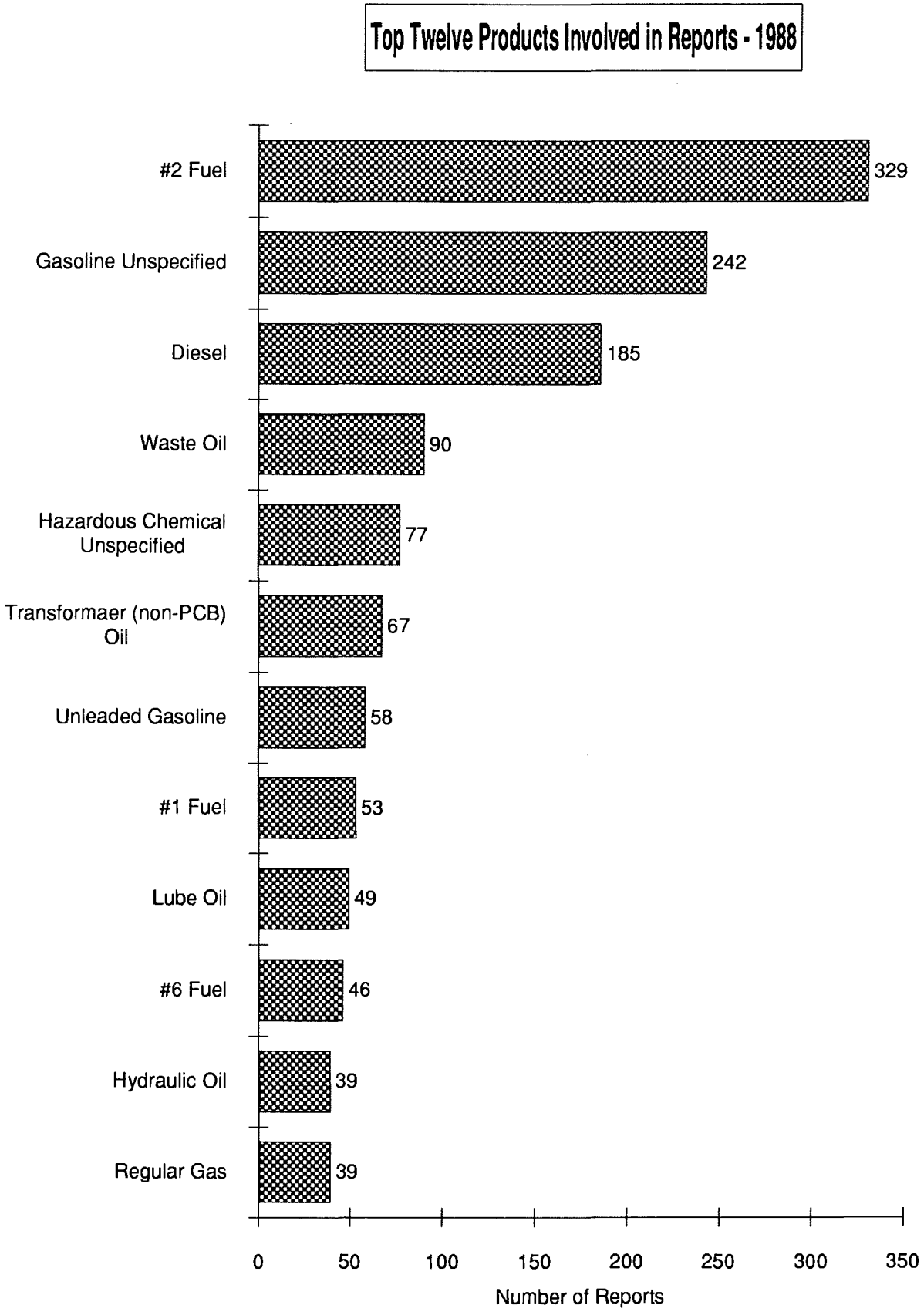
Product Type	Number of Reports
None	245
#1 Fuel	53
#2 Fuel	329
#3 Fuel	0
#4 Fuel	10
#5 Fuel	5
#6 Fuel	46
Heating Oil Unsp.	7
Lube Oil	49
Chemical	5
Unknown Substance	34
Gasoline Unspecified	242
Regular Gas	39
Premium Leaded Gas	3
Unleaded Gasoline	58
Aviation Gasoline	3
JP-3	1
JP-4	1
JP-1 or Jet A	3
Premium Unleaded Gas	12
Diesel	185
Unspecified Motor Fuel	25
Asphalt	6
Animal Fats/Remains	1
Marsh Sheen	3
Algea Bloom	5
Non-Chem. Non-Oil Unspecified	18
Pesticide General	10
PCB Oil	16
Sulfuric Acid	21
Caustic Soda	6
Chlorine	17
Hazardous Chemical Unspecified	77
Other Unspecified (mixtures)	38
Waste Oil	90
Anti-Freeze	3
Transmission Oil	1
Hydraulic Oil	39
Transformaer (non-PCB) Oil	67
Black Liquor	5
Non-Hazardous Chem Unspecified	27
Total	**1805**



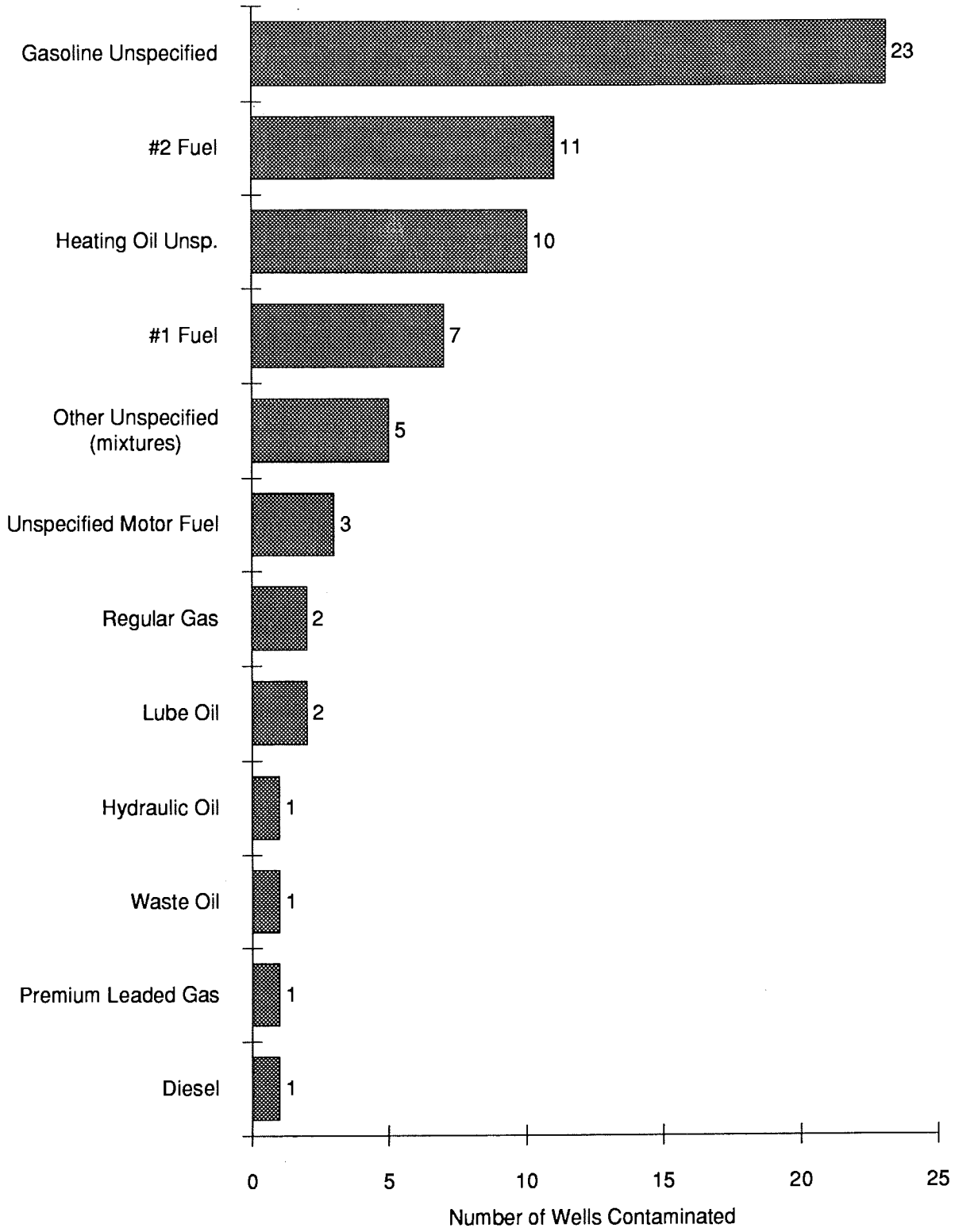
The Product Categories above contain the following product types :

Home Heating Oils	Heavy Feul Oils	Motor Fuels	Other Oils
#1 Fuel	#4 Fuel	Regular	Lube Oil
#2 Fuel or Kerosene	#5 Fuel	Unleaded	Waste
#3 Fuel	#6 Fuel	Aviation	Hydraulic
		Premium Unleaded	Transmission
			Other Unspecified

☆☆☆ Note : This chart's primary purpose is to show that Home heating oils and Motor Fuels are the most frequent contaminants found by response services in wells (or groundwater). By this analysis, they are the greatest threat to Maine's groundwater. Close examination of the chart data shows also that the ratio of home heating oil and motor fuel spills to well contaminations is about 18:1. That is to say, on average every eighteenth spill of home heating oil or motor fuel results in one contaminated well case.


Top Twelve Products Involved in Reports - 1988
#2 Fuel
329
Gasoline Unspecified
242
Diesel
185
Waste Oil
90
Hazardous Chemical Unspecified
77
Transformaer (non-PCB) Oil
67
Unleaded Gasoline
58
#1 Fuel
53
Lube Oil
49
#6 Fuel
46
Hydraulic Oil
39
Regular Gas
39
0
50
100
150
200
250
300
350
Number of Reports

Top Twelve Products Contaminating Wells - 1988



Oil vs Hazardous reports broken down with Products involved where Wells are Impacted or Threatened
1988

Office	Spill Type	Surface Oil Incident	Wells At risk	Wells Impacted
Augusta				
	#1 Fuel	3	3	1
	#2 Fuel	7	8	1
	Regular Gas	1	2	2
	Unleaded Gasoline	1	1	0
	Premium Unleaded Gas	1	3	1
	Diesel	1	1	0
	Sulfuric Acid	1	1	0
	Hydraulic Oil	1	1	1

	Groundwater Oil Incident		
#1 Fuel	3	4	3
#2 Fuel	3	3	2
Heating Oil Unspecified	1	0	10
Unknown Substance	2	2	0
Gasoline Unspecified	12	12	4
Unspecified Motor Fuel	2	3	1

	Haz. Mat Incident		
Hazardous Chem. Unsp.	1	0	1

	Surface Oil Investigation		
Other Unspecified	1	1	0

	Groundwater Oil Investigation		
None	1	1	0
#2 Fuel Oil	2	2	1
Gasoline Unspecified	4	6	0
Unleaded Gasoline	2	3	0

Office	Spill Type	Surface Oil Incident	Wells At risk	Wells Impacted
Bangor				
	#1 Fuel	8	8	1
	#2 Fuel	14	14	0
	Lube Oil	1	1	0
	Gasoline Unspecified	1	1	0
	Unleaded Gasoline	2	3	0
	Diesel	3	5	0
	Hydraulic Oil	1	1	0

	Groundwater Oil Incident		
#1 Fuel Oil	3	2	2
#2 Fuel Oil	4	4	1
Lube Oil	1	1	1
Gasoline Unspecified	18	27	10
Regular Gasoline	3	4	0
Unleaded Gasoline	1	1	0
Premium Unleaded	1	1	0
Diesel	1	1	1
Unspecified Motor Fuel	1	2	1

	Haz. Mat Incident		
Caustic Soda	1	1	0

	Surface Oil Investigation		
None	2	2	0

	Groundwater Oil Investigation		
None	9	10	0

Office	Spill Type	Surface Oil Incident	Wells At risk	Wells Impacted
Presque Isle				
	#1 Fuel	1	3	0
	#2 Fuel	4	4	1
	Lube Oil	1	1	1
	Diesel	1	1	0
	Asphalt	1	1	0
	Other Unspecified	2	2	1

	Groundwater Oil Incident		
#2 Fuel	9	9	4
Gasoline Unspecified	3	3	1
Regular Gasoline	1	1	0
Unspecified Motor Fuel	1	1	1

	Surface Oil Investigation		
#2 Fuel	1	1	0

	Groundwater Oil Investigation		
Regular Gasoline	1	1	0
Uleaded Gasoline	1	1	0

Office	Spill Type	Surface Oil Incident	Wells At risk	Wells Impacted
South Portland				
	#1 Fuel	1	2	0
	#2 Fuel	11	18	1
	Gasoline Unspecified	4	5	1
	Regular Gas	1	1	0
	Diesel	3	3	0
	Other Unspecified	1	1	1
	Waste Oil	1	1	0
	Hydraulic Oil	1	1	0

	Groundwater Oil Incident		
#2 Fuel Oil	2	3	0
#4 Fuel Oil	1	2	0
Gasoline Unspecified	7	9	7
Regular Gasoline	1	2	0
Other Unspecified	4	3	3
Waste Oil	1	0	1

	Surface Oil Investigation		
None	1	1	0

		At Risk	Impacted
Grand Totals		**226**	**68**

Amounts of Material Spilled by Response Area and Incident Classification for 1988

OFFICE - REGIONAL AREA	SPILL INCIDENT CLASSIFICATION	GALLONS	CUBIC YARDS	POUNDS
AUGUSTA	Surface Oil Incident	25,646.83	0.00	0.00
	Groundwater Oil Incident	6,586.25	0.00	0.00
	Haz. Mat. Incident	124,869.90	0.00	24.06
	Surface Oil Investigation	623.11	0.00	1,500.00
	Groundwater Oil Investigation	5,836.60	0.00	0.00
	Haz. Mat. Investigation	413.11	0.00	0.00
	Office Totals	163,975.80	0.00	1,524.06
BANGOR	Surface Oil Incident	19,349.24	0.00	0.00
	Groundwater Oil Incident	9,147.18	0.00	0.00
	Haz. Mat. Incident	6,852.79	0.00	0.00
	Surface Oil Investigation	0.00	0.00	0.00
	Groundwater Oil Investigation	0.00	0.00	0.00
	Haz. Mat. Investigation	3,448.00	0.00	0.00
	Office Totals	38,797.21	0.00	0.00
PRESQUE ISLE	Surface Oil Incident	5,008.44	0.00	300.00
	Groundwater Oil Incident	1,892.96	0.00	0.00
	Haz. Mat. Incident	229.66	0.00	111.08
	Surface Oil Investigation	32.95	0.00	0.00
	Groundwater Oil Investigation	1,633.78	0.00	0.00
	Haz. Mat. Investigation	20,090.55	0.00	100.99
	Office Totals	28,888.34	0.00	512.07
SOUTH PORTLAND	Surface Oil Incident	23,186.38	0.00	100.00
	Groundwater Oil Incident	12,741.50	39.00	0.00
	Haz. Mat. Incident	742.19	0.00	1.25
	Surface Oil Investigation	451.25	0.00	0.00
	Groundwater Oil Investigation	131.00	0.00	0.00
	Haz. Mat. Investigation	4.00	3.00	0.00
	Office Totals	37,256.32	42.00	101.25
All Offices Total	Surface Oil Incidents	73,190.89	0.00	400.00
Total	Groundwater Oil Incidents	30,367.89	39.00	0.00
Total	Haz. Mat. Incidents	132,694.54	0.00	136.39
Total	Surface Oil Investigations	1,107.31	0.00	1,500.00
Total	Groundwater Oil Investigations	7,601.38	0.00	0.00
Total	Haz. Mat. Investigations	23,955.66	3.00	100.99
Grand Total All Offices & Classifications		268,917.67	42.00	2,137.38

*** **NOTE : All Numeric fields are BEST ESTIMATES based on the years of experience**
*** **with spill events of the OHMSs involved.**

PRODUCT RECOVERED FOR 1988
By Resonse Area & Incident Class

OFFICE - REGIONAL AREA	SPILL INCIDENT CLASSIFICATION	GALLONS	CUBIC YARDS	POUNDS
AUGUSTA	Surface Oil Incident	16,750.32	65.99	0.00
	Groundwater Oil Incident	2,992.47	220.99	0.00
	Haz. Mat. Incident	43,809.47	0.00	0.00
	Surface Oil Investigation	279.16	0.00	0.00
	Groundwater Oil Investigation	4,529.31	0.00	0.00
	Haz. Mat. Investigation	190,240.13	0.00	0.00
	Office totals	258,600.86	286.98	0.00
BANGOR	Surface Oil Incident	14,060.97	0.00	0.00
	Groundwater Oil Incident	5,214.50	0.00	0.00
	Haz. Mat. Incident	5,076.80	0.00	0.00
	Surface Oil Investigation	0.00	0.00	0.00
	Groundwater Oil Investigation	0.00	0.00	0.00
	Haz. Mat. Investigation	2,554.50	0.00	0.00
	Office totals	26,906.77	0.00	0.00
PRESQUE ISLE	Surface Oil Incident	1,735.72	0.50	0.00
	Groundwater Oil Incident	598.96	0.40	0.00
	Haz.Mat. Incident	86.59	0.10	0.00
	Surface Oil Investigation	4.99	0.30	0.00
	Groundwater Oil Investigation	173.92	60.00	0.00
	Haz. Mat. Investigation	0.00	0.00	0.00
	Office totals	2,600.18	61.30	0.00
SOUTH PORTLAND	Surface Oil Incident	11,383.91	69.00	85.00
	Groundwater Oil Incident	2,436.50	2,049.00	0.00
	Haz. Mat. Incident	330.00	0.10	0.25
	Surface Oil Investigation	651.25	0.00	0.00
	Groundwater Oil Investigation	120.00	0.00	0.00
	Haz. Mat. Investigation	2.00	0.00	0.10
	Office totals	14,923.66	2,118.10	85.35
Total	Surface Oil Incidents	43,930.92	135.49	85.00
Total	Groundwater Oil Incidents	11,242.43	2,270.39	0.00
Total	Haz. Mat. Incident	239,302.86	0.20	0.25
Total	Surface Oil Investigation	935.40	0.30	0.00
Total	Groundwater Oil Investigation	4,823.23	60.00	0.00
Total	Haz. Mat. Investigation	2,796.63	0.00	0.10
	Grand Total of All	303,031.47	2,466.38	85.35

Percentage of Products Recovered in Spill Incidents for All Offices

Surface Oil Incidents	60%	FR	21%
Groundwater Oil Incidents	37%	FR	NA
Haz. Mat. Incident	FR	FR	0%

FR - Full recovery or seemingly
NA - Not Applicable, no spills

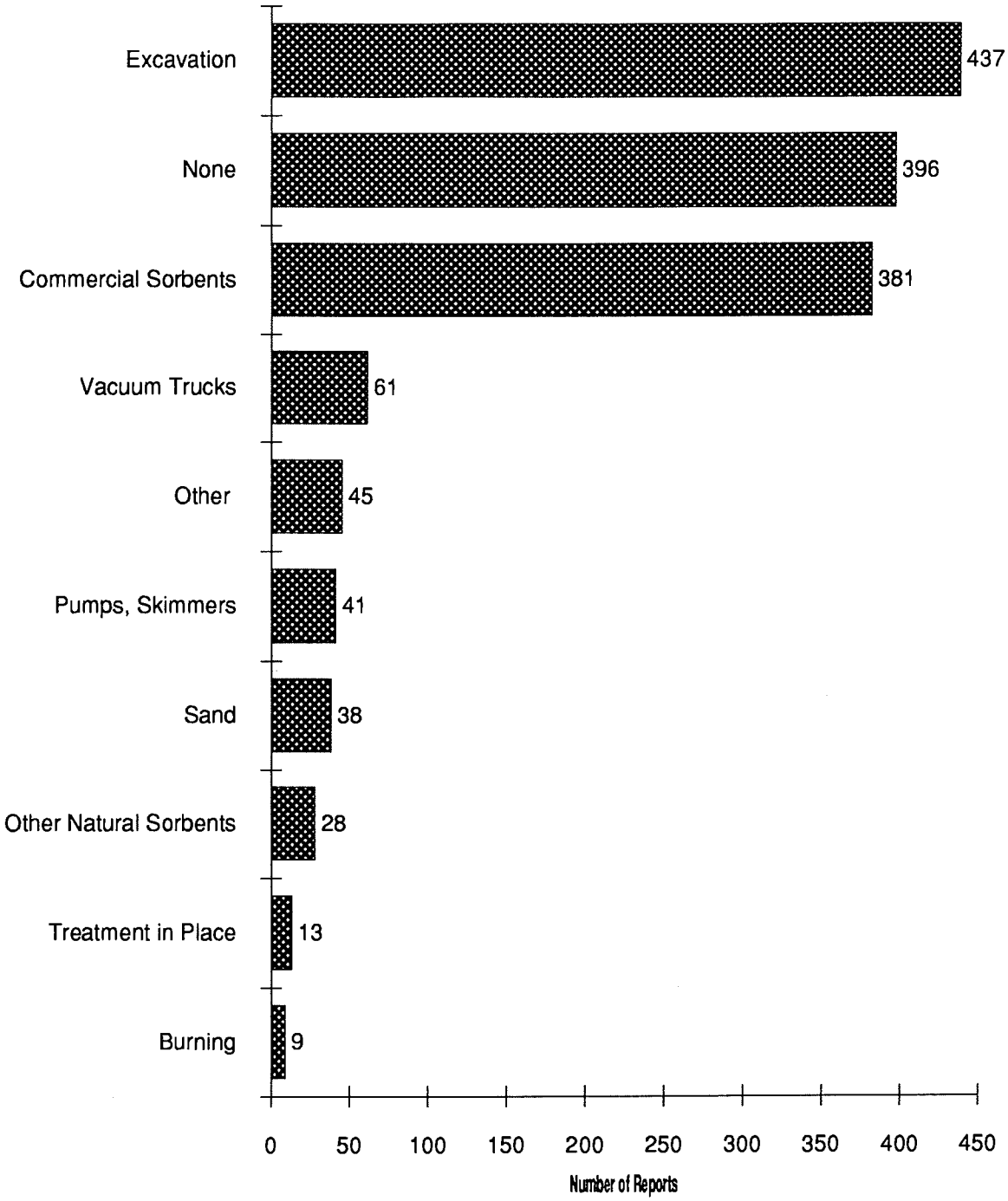
*** NOTE : All Numeric fields are BEST ESTIMATES based on the years of experience
*** with spill events of the OHMSs involved.

Methods used in the Recovery of Spilled Products

BOHMC Response Services - 1988

	Regional Feild Offices				
Recovery Method	**A**	**B**	**PI**	**P**	**Total**
Vacuum Trucks	23	5	1	32	61
Pumps, Skimmers	13	21	2	5	41
Commercial Sorbents	109	146	29	97	381
Sand	15	14	1	8	38
Other Natural Sorbents	5	6	7	10	28
Excavation	126	155	42	114	437
Burning	1	5	3	0	9
Treatment in Place	3	3	3	4	13
Other	20	10	3	12	45
None	122	193	0	54	369

Recovery Methods Used - 1988



The table "Types of Hazardous Material Spilled - 1988", on the page following, contains a summary of the best information available to Response Services as to the types of chemicals spilled during 1988. I say "best information" since it is not always possible to identify an unknown substance in any but the broadest of terms. General characteristics such as flash point, or pH are often the only factors that can be determined about an unknown without costly laboratory analysis. Given these factors, a substance may qualify as a hazardous material, yet remain an unknown. The problem of estimating amounts spilled can also be difficult. Uncontrolled sites may have had any number of products dumped there for months or years, before anyone notices or decides to report the event(s). Catastrophic events, like floods result in barrels, jugs and other containers, being released into the environment full or partially so with product and turning up empty or with their contents diluted. Fires can destroy building structures leaving containers open to rains, snows and other environmental weathering. As a result of all this, estimates of amounts spilled are often only a best guess. Each substance listed was discharged in at least the amount listed, often it is reasonable to assume more than that amount was lost to the environment.

There are cases where this assumption should not be made. Most spills are industrial in nature, that is to say a company either public or private has had an accident and product was lost. In general, industries know what chemicals are in what processes and in what volumes. CMP for instance knows how much oil is in a transformer and on those occasions when one is ruptured they know how much oil is lost. No guess work is involved. Keeping in mind the health and safety of the public as well as its employees, CMP then handles the material as though it were PCB contaminated until enough evidence is collected to show otherwise. Pure product fields, as a result of this industry scrutiny, should contain accurate data. Cases where only a general family of hazardous materials are listed may well contain spill amounts that are quite a bit more than the amounts listed.

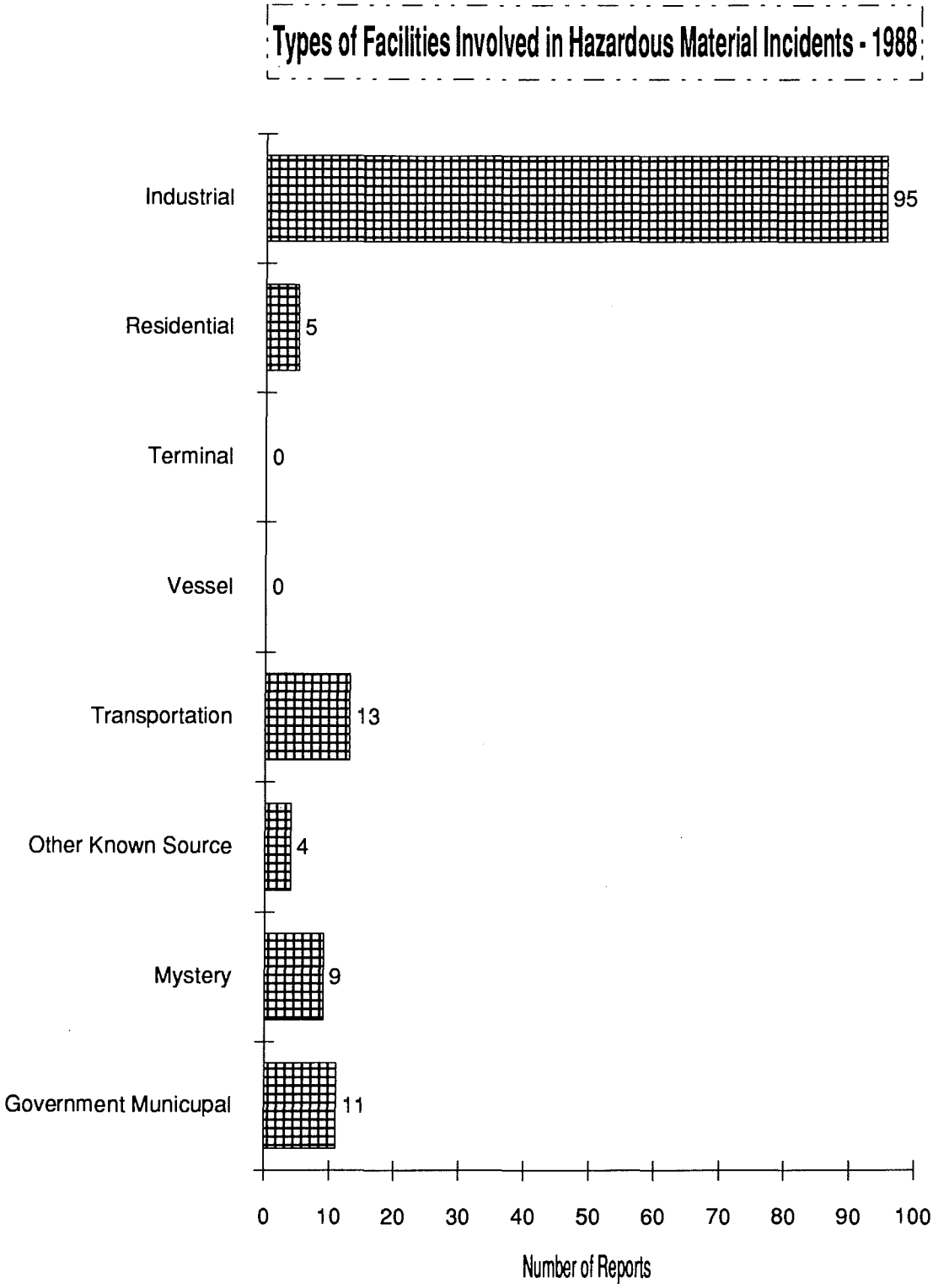
The following symbolisms have been utilized

G	-	Gallons
Lbs	-	Pounds
Y	-	Cubic Yards
?	-	Unknown
G ? or Y ?	-	The amount listed plus an unknown amount from other incidents was lost.

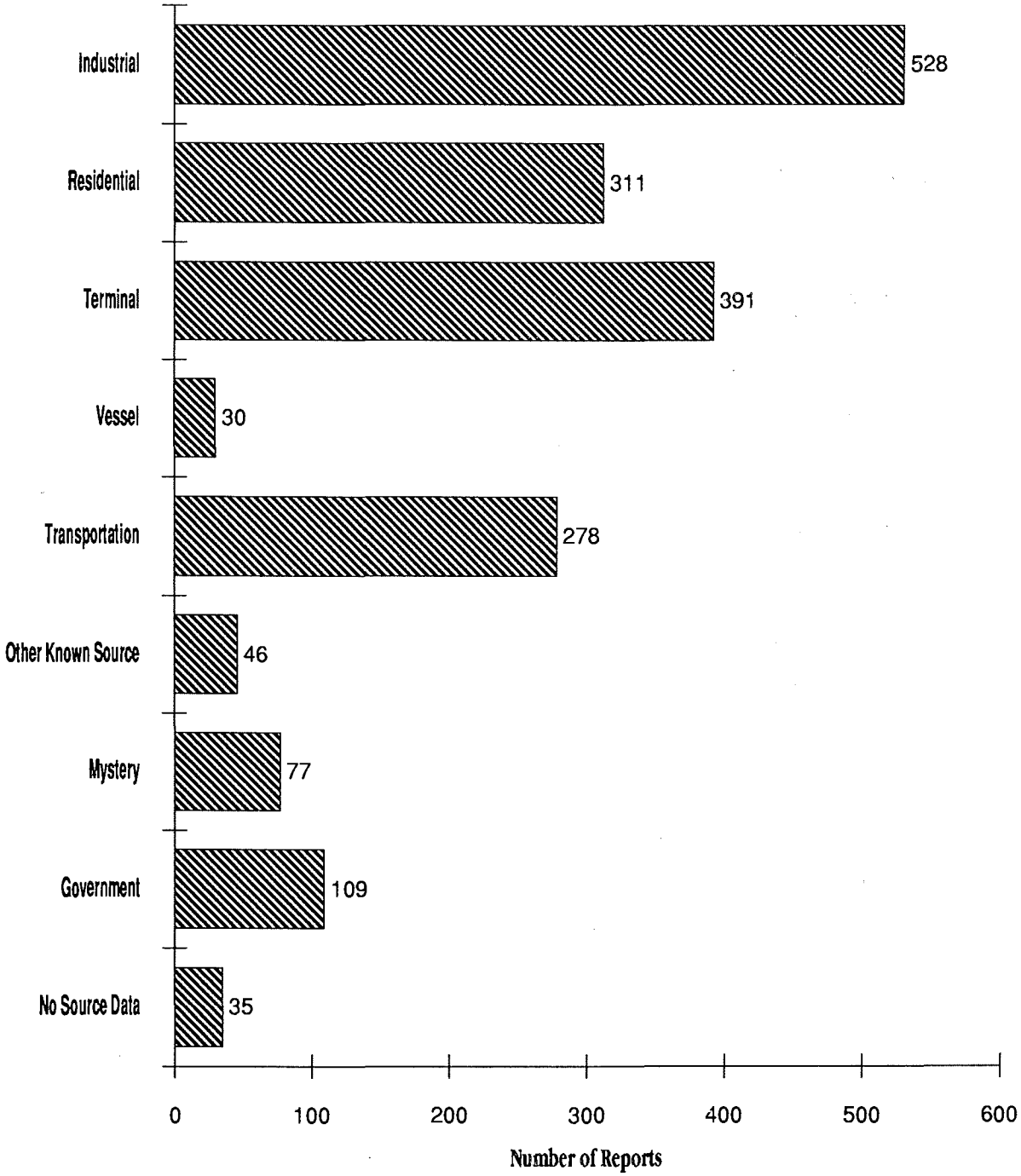
Types of Hazardous Materials Spilled - 1988

Chemical Types	Total	Units
Alkaline Etchant	25	G
Anhydrous Ammonia	10	G
Anhydrous Ammonia	153	P
Bacteria	0.99	?
Battery Acid	0.99	?
Battery Acid	33	G
Black Liquor	0.99	G?
Calcium Hypochlorite	0.99	G?
Carburetor Cleaner	5	G
Caustic Soda	5.1	G
Caustic Soda	0.99	G?
Cellulose Nitrate	40	G
Chlorine	10	G
Chlorine	1.9	G?
Chlorine	72	P
Chlorine	13.99	P?
Chlorine Dioxide	112019	G
Chlorine Dioxide	0.99	G?
Coal Tar	1000.99	G?
Dialysis Bag	0	?
Dialysis Bag	1	P
Dichlorobenzene	283	G
Diesel Fuel	15.99	G?
Diethanolomme	0.99	G?
Fertilizer	1365	G
Fireworks	4.99	Y?
Formaldehyde	1	G
Fungicide	1	G
Gasoline Sludge	40	G
Herbicide	13.5	G
Household Chemicals	4	G
Hydrochloric Acid	4	G
Hydrogen Chloride	505	G
Hydrogen Sulfide Gas	0.99	?
Hypodermic Needle	0	?
Laquer Thinner	20.99	G?
Low PH Material	200.99	G?
Magnesium Hydroxide	75	G
Mercury	10.99	P?
Metal Hydroxide Sludge	250	G
Mixed Chemicals	100	G
Mixed Wastes	1.99	G?

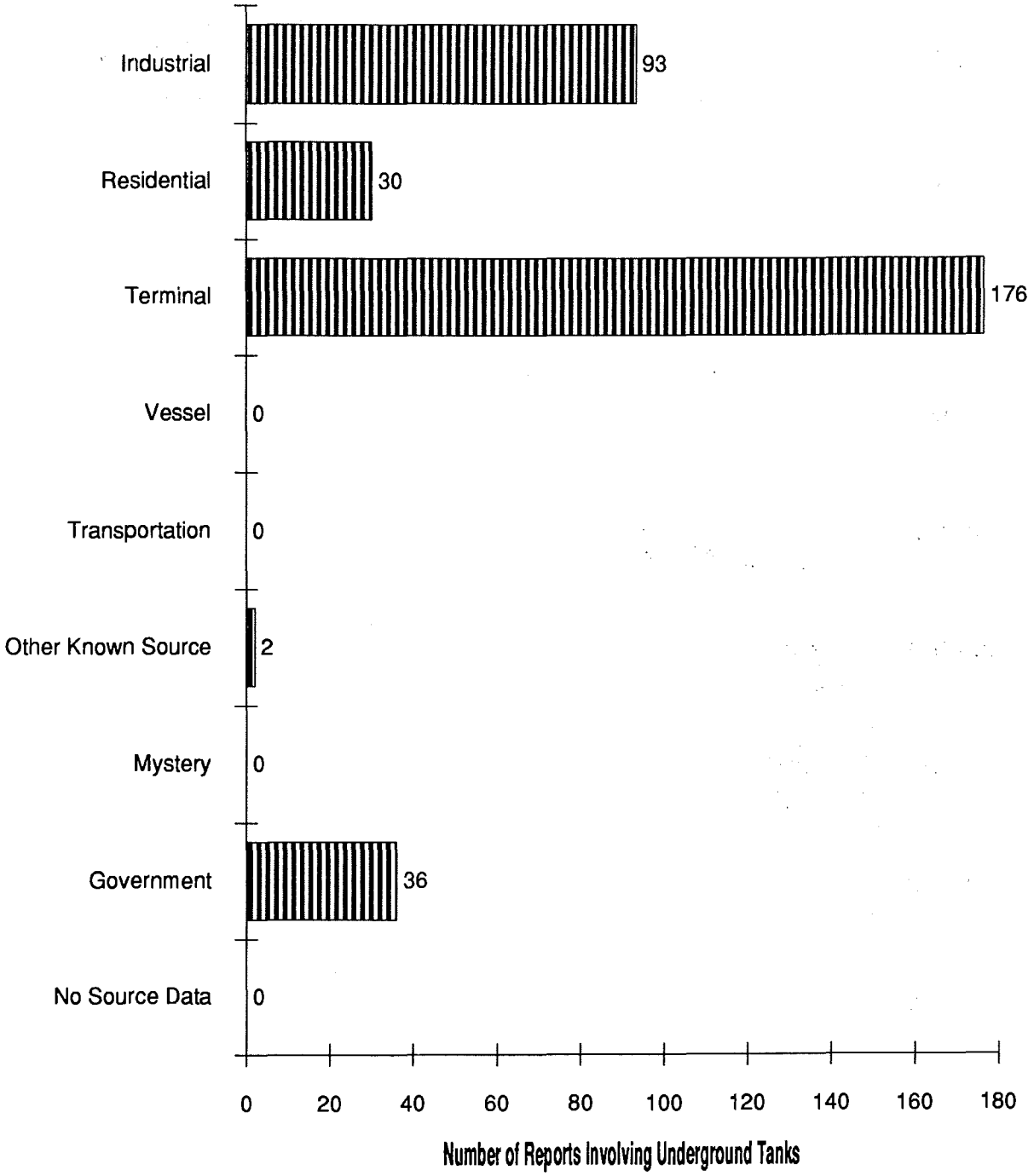
Chemical Types	Total	Units
non-PCB-oil	7.1	G
non-PCB-oil	5.99	G?
Oil Sludge	1300.99	G?
Paint	55	G
PBC	70.97	G
PCB	53.96	G?
PCB	0.1	P
Perchloroethylene	13	G
Perchloroethylene	0.99	G?
Pesticide	51	G
Phosphoric Acid	15	G
Plastic Tube	0.25	P
Polyurethane Conpounds	50	G
Propane	0.99	P?
Roofing Chemicals	0	
Roofing Tar	1	G
Sodium Aluminate	100	G
Sodium Chromate	8000	G
Sodium Chromate	0.1	P
Sodium Hydroxide	2530	G
Sodium Hydroxide	0.99	P?
Sodium Hypochlorite	2275	G
Starting Fluid	1.99	G?
Sulfuric Acid	1688	G
Sulfuric Acid	368.9	G?
Tricalcium Arsenate	1.99	Y?
Trichloroethane	34	G
Trichloroethane	10.99	G?
Unknown	1.99	G?
Used Motor Oil	30.99	G?
White Liquor	350	G


Types of Facilities Involved in Hazardous Material Incidents - 1988
Industrial
95
Residential
5
Terminal
0
Vessel
0
Transportation
13
Other Known Source
4
Mystery
9
Government Municupal
11
0
10
20
30
40
50
60
70
80
90
100
Number of Reports

Types of Facilities Involved in All Report Classes - 1988



Reports by Facility Where Underground Storage Tanks Were Involved - 1988



Oil Terminal Transactions by Month Involving Payments to The Groundwater Fund (4535.2) During Calendar Year 1888

	TOTAL TRANSACTIONS	TOTAL BARRELS
JANUARY	170	5,591,602.19
FEBRUARY	140	5,127,186.66
MARCH	113	3,711,698.42
APRIL	117	4,252,266.56
MAY	81	2,609,157.00
JUNE	102	3,101,435.17
JULY	122	4,071,836.53
AUGUST	121	4,127,478.76
SEPTEMBER	126	3,712,706.93
OCTOBER	168	4,153,749.30
NOVEMBER	171	4,125,320.04
DECEMBER	222	5,015,855.34
FINAL TOTALS	1653	49,600,292.90

Oil Terminal Transactions by Month Involving Payments to The Coastal Surface Clean-up Fund Fund (4535.1) During Calendar Year 1888

	TOTAL TRANSACTIONS	TOTAL BARRELS
JANUARY	176	8,687,752.19
FEBRUARY	143	6,840,495.66
MARCH	120	6,932,316.42
APRIL	123	6,820,010.56
MAY	86	4,126,000.00
JUNE	106	4,667,369.17
JULY	130	6,310,099.53
AUGUST	128	6,643,533.76
SEPTEMBER	129	4,767,828.93
OCTOBER	176	5,806,538.10
NOVEMBER	192	6,724,983.14
DECEMBER	225	6,334,760.34
FINAL TOTALS	1734	74,661,687.80