OCS Study MMS 2005-O61

FINAL REPORT

VOLUME II - APPENDICES

Alternative Oil Spill Occurrence Estimators and their Variability for the Beaufort Sea – Fault Tree Method

MMS Contract Number 1435-01-04-PO-336507

January, 2006

By

Bercha International Inc.
Calgary, Alberta, Canada

U.S. Department of the Interior
Minerals Management Service
Alaska Outer Continental Shelf Region

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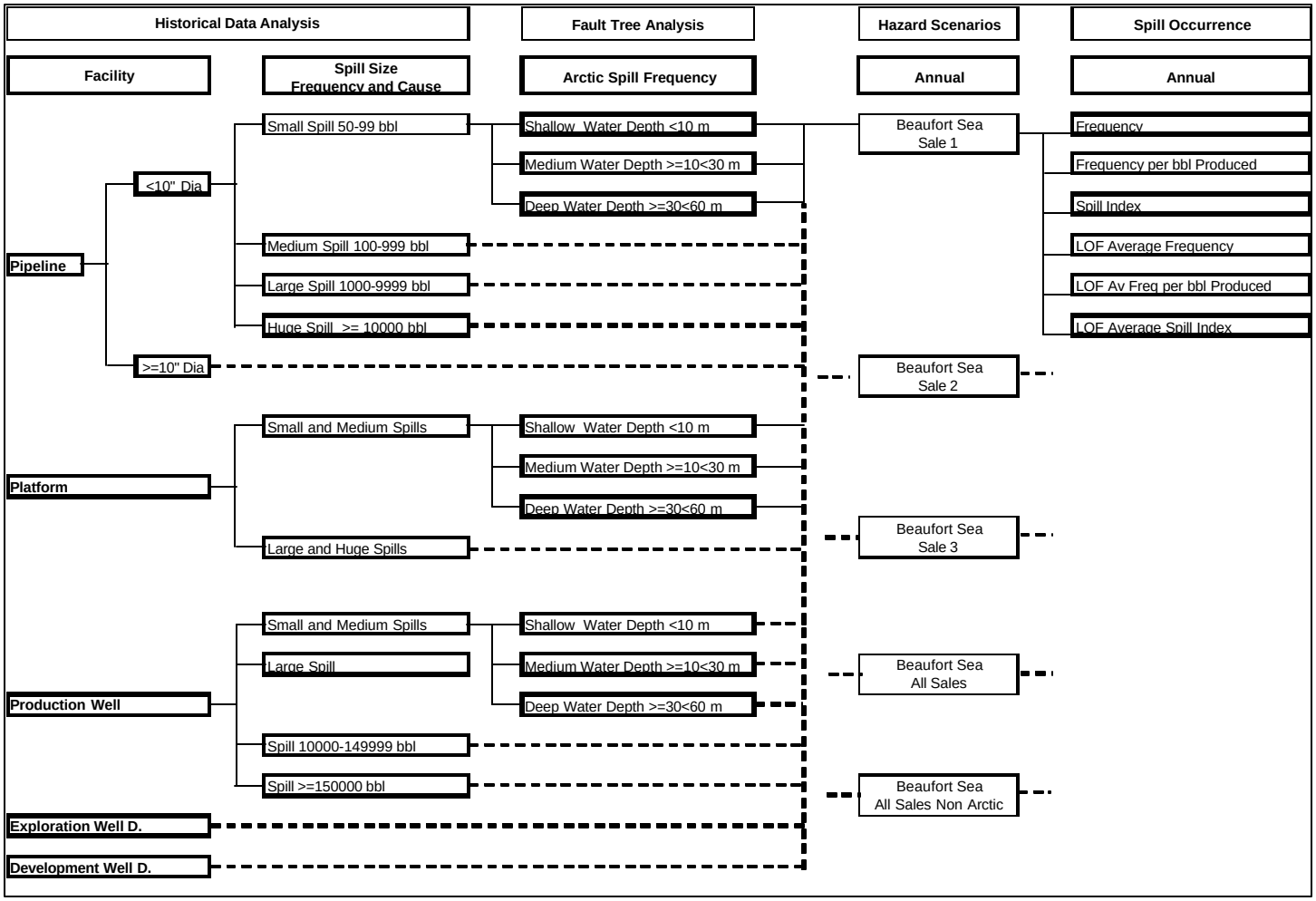


Figure F.0
Flow Chart

APPENDIX 1

Historical Data Analysis

Table 1.1
Analysis of Historical Spills - Pipeline

CAUSE CLASSIFICATION	NUMBER OF SPILLS	SPILL SIZE BBL										NUMBER OF SPILLS					
		1	2	3	4	5	6	7	8	9	10	S	M	L	H	SM	LH
CORROSION	**4**											**1**	**2**	**1**		**3**	**1**
External	1	80										1				**1**	
Internal	3	100	5000	414									2	1		**2**	**1**
THIRD PARTY IMPACT	**16**											**2**	**5**	**6**	**3**	**7**	**9**
Anchor Impact	10	19833	65	50	300	900	323	15576	2000	800	1211	2	4	2	2	**6**	**4**
Jackup Rig or Spud Barge	1	3200												1			**1**
Trawl/Fishing Net	5	4000	100	14423	4569	4533							1	3	1	**1**	**4**
OPERATION IMPACT	**4**											**3**		**1**		**3**	**1**
Rig Anchoring	1	50										1				**1**	
Work Boat Anchoring	3	50	5100	50								2		1		**2**	**1**
MECHANICAL	**2**												**2**			**2**	
Connection Failure	1	135											1			**1**	
Material Failure	1	210											1			**1**	
NATURAL HAZARD	**4**											**1**	**1**	**2**		**2**	**2**
Mud Slide	3	250	80	8212								1	1	1		**2**	**1**
Storm/ Hurricane	1	3500												1			**1**
ARCTIC																	
Ice Gouging																	
Strudel Scour																	
Upheaval Buckling																	
Thaw Settlement																	
Other																	
UNKNOWN	**1**	119											**1**			**1**	
TOTALS	**31**											**7**	**11**	**10**	**3**	**18**	**13**

Table 1.2
Distribution and Frequency of Historical Spills - Pipeline

CAUSE CLASSIFICATION	Small and Medium Spills 50-999 bbl				Large and Huge Spills >=1000 bbl			
	HIST. DISTRIBUTION %	NUMBER OF SPILLS	EXPOSURE [km-years]	FREQUENCY spill per 10^5km-year	HIST. DISTRIBUTION %	NUMBER OF SPILLS	EXPOSURE [km-years]	FREQUENCY spill per 10^5km-year
CORROSION	**16.67**	**3**		**1.6027**	**7.69**	**1**		**0.5342**
External	5.56	1		0.5342				
Internal	11.11	2		1.0685	7.69	1		0.5342
THIRD PARTY IMPACT	**38.89**	**7**		**3.7397**	**69.23**	**9**		**4.8081**
Anchor Impact	33.33	6		3.2054	30.77	4		2.1369
Jackup Rig or Spud Barge					7.69	1		0.5342
Trawl/Fishing Net	5.56	1		0.0534	30.77	4		2.1369
OPERATION IMPACT	**16.67**	**3**		**1.6027**	**7.69**	**1**		**0.5342**
Rig Anchoring	5.56	1		0.5342				
Work Boat Anchoring	11.11	2		1.0685	7.69	1		0.5342
MECHANICAL	**11.11**	**2**		**1.0685**				
Connection Failure	5.56	1	**187183**	0.5342			**187183**	
Material Failure	5.56	1		0.5342				
NATURAL HAZARD	**11.11**	**2**		**1.0685**	**15.38**	**2**		**1.0685**
Mud Slide	11.11	2		1.0685	7.69	1		0.5342
Storm/ Hurricane					7.69	1		0.5342
ARCTIC								
Ice Gouging								
Strudel Scour								
Upheaval Buckling								
Thaw Settlement								
Other								
UNKNOWN	**5.56**	**1**		**0.5342**				
TOTALS	**100.00**	**18**		**9.6163**	**100.00**	**13**		**6.9451**

Table 1.3
Historical Spills Data - Pipeline

GOM OCS Pipeline Spills, Categorized 1972-99		Spill Statistics	Exposure**	Frequency
		Number of Spills	km-years	spills per 10^5 km-years
By Pipe Diameter				
	< 10"	16	105,336	15.1894
	>= 10"	15	81,847	18.3270
By Spill Size				
	Small 50-99 bbl	6	187,183	3.2054
	Medium 100 - 999 bbl	12	187,183	6.4108
	Large 1000 - 9999 bbl	10	187,183	5.3424
	Huge >=10000 bbl	3	187,183	1.6027
By Diameter, By Spill Size				
< 10"	Small 50-99 bbl	4	105,336	3.7974
	Medium 100 - 999 bbl	7	105,336	6.6454
	Large 1000 - 9999 bbl	4	105,336	3.7974
	Huge >=10000 bbl	1	105,336	0.9493
>= 10"	Small <100 bbl	2	81,847	2.4436
	Medium 100 - 999 bbl	5	81,847	6.1090
	Large 1000 - 9999 bbl	6	81,847	7.3308
	Huge >=10000 bbl	2	81,847	2.4436

*14 of the 31 records have both MIN_WATER_DEPTH and MAX_WATER_DEPTH set to "0".

**Exposure comes from an analysis of PPL_MASTERS database as published on Feb 15, 2001. Ratio for <10"/>10"=1.287

Table 1.4
Historical Spills Data - Pipeline - Variability

GOM OCS Pipeline Spills, Categorized 1972-99		Low Factor	High Factor	Frequency spill per 10^5 km-years				
				Historical	Low	Mode	High	Expected
By Diameter, By Spill Size								
<10"	**Small**	0	2.57	3.7974	0	1.6329	9.7592	5.1720
	Medium	0	2.57	6.6454	0	2.8575	17.0786	9.0510
	Large	0	2.57	3.7974	0	1.6329	9.7592	5.1720
	Huge	0	2.57	0.9493	0	0.4082	2.4398	1.2930
>=10"	**Small**	0	2.57	2.4436	0	1.0507	6.2800	3.3282
	Medium	0	2.57	6.1090	0	2.6269	15.7001	8.3205
	Large	0	2.57	7.3308	0	3.1522	18.8401	9.9846
	Huge	0	2.57	2.4436	0	1.0507	6.2800	3.3282

Table 1.5
Analysis of Historical Spills - Platforms

CAUSE CLASSIFICATION	NUMBER OF SPILLS	SPILL SIZE BBL													NUMBER OF SPILLS					
		1	2	3	4	5	6	7	8	9	10	11	12	13	S	M	L	H	SM	LH
PROCESS FACILITY RLS.	**13**	130	50	120	104	60	1456	125	50	50	55	400	280	75	**6**	**6**	**1**		**12**	**1**
STORAGE TANK RLS.	**3**	9935	7000	435												**1**	**2**		**1**	**2**
STRUCTURAL FAILURE	**1**	58													**1**				**1**	
HURRICANE/STORM	**2**	75	66												**2**				**2**	
COLLISION	**2**	600	108													**2**			**2**	
ARCTIC																				
Ice Force																				
Facility Low Temperature																				
Other																				
TOTALS	**21**														**9**	**9**	**3**		**18**	**3**

Table 1.6
Distribution and Frequency of Historical Spills - Platforms

CAUSE CLASSIFICATION	Small and Medium Spills 55-999 bbl				Large and Huge Spills >=1000 bbl			
	HIST. DISTRIBUTION %	NUMBER OF SPILLS	EXPOSURE [well-years]	FREQUENCY spill per 10^4well-year	HIST. DISTRIBUTION %	NUMBER OF SPILLS	EXPOSURE [well-years]	FREQUENCY spill per 10^4well-year
PROCESS FACILITY RLS.	66.67	**12**	**119714**	**1.0024**	33.33	**1**	**119714**	**0.0835**
STORAGE TANK RLS.	5.56	**1**		**0.0835**	66.67	**2**		**0.1671**
STRUCTURAL FAILURE	5.56	**1**		**0.0835**				
HURRICANE/STORM	11.11	**2**		**0.1671**				
COLLISION	11.11	**2**		**0.1671**				
ARCTIC								
Ice Force								
Facility Low Temperature								
Other								
TOTALS	**100.00**	**18**		**1.5036**	**100.00**	**3**		**0.2506**

Table 1.7
Historical Spills Data - Platforms - Variability

Frequency Unit	Low Factor	High Factor	Historical	Low	Mode	High	Expected
			Small and Medium Spills 50-999 bbl				
spill per 10^4well-year	0	2.88	1.5036	0.0000	0.1804	4.3303	2.1571
			Large and Huge Spills >=1000 bbl				
spill per 10^4well-year	0	2.88	0.2506	0.0000	0.0301	0.7217	0.3595

Table 1.8
Frequency of Historical Spills - Wells

EVENT	FREQUENCY UNIT	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Small, Medium, and Large Spills 50-9999 bbl	Spills 10000-149999 bbl	Spills >=150000 bbl	All spills
		HISTORICAL FREQUENCY					
PRODUCTION WELL	spills per 10^4 well-year	0.15	1.03	1.18	0.44	0.29	1.91
EXPLORATION WELL DRILLING	spills per 10^4 wells	1.97	13.75	15.72	5.91	3.42	25.05
DEVELOPMENT WELL DRILLING	spills per 10^4 wells	0.65	4.57	5.22	1.96	1.96	9.15

Table 1.9
Frequency of Historical Spills - Wells - Variability

EVENT	FREQUENCY UNIT	Low Factor	High Factor	Frequencies				
				Historical	Low	Mode	High	Expected
				Small and Medium Spills 50-999 bbl				
PRODUCTION WELL	spill per 10^4 well-year	0.448	1.545	0.147	0.066	0.148	0.227	0.147
EXPLORATION WELL DRILLING	spill per 10^4 wells	0.439	2.036	1.966	0.863	1.032	4.002	2.262
DEVELOPMENT WELL DRILLING	spill per 10^4 wells	0.437	1.760	0.654	0.286	0.526	1.151	0.692
				Large Spills 1000-9999 bbl				
PRODUCTION WELL	spill per 10^4 well-year	0.448	1.545	1.028	0.460	1.037	1.588	1.026
EXPLORATION WELL DRILLING	spill per 10^4 wells	0.439	2.036	13.754	6.039	7.220	28.001	15.824
DEVELOPMENT WELL DRILLING	spill per 10^4 wells	0.437	1.760	4.570	1.998	3.671	8.041	4.833
				Small, Medium and Large Spills 50-9999 bbl				
PRODUCTION WELL	spill per 10^4 well-year	0.448	1.545	1.175	0.526	1.185	1.815	1.173
EXPLORATION WELL DRILLING	spill per 10^4 wells	0.439	2.036	15.719	6.903	8.252	32.003	18.086
DEVELOPMENT WELL DRILLING	spill per 10^4 wells	0.437	1.760	5.224	2.284	4.197	9.192	5.525
				Spill 10000-149999 bbl				
PRODUCTION WELL	spill per 10^4 well-year	0.448	1.545	0.441	0.197	0.444	0.681	0.440
EXPLORATION WELL DRILLING	spill per 10^4 wells	0.439	2.036	5.909	2.595	3.102	12.031	6.799
DEVELOPMENT WELL DRILLING	spill per 10^4 wells	0.437	1.760	1.963	0.858	1.577	3.454	2.076
				Spill >=150000 bbl				
PRODUCTION WELL	spill per 10^4 well-year	0.448	1.545	0.294	0.132	0.296	0.454	0.293
EXPLORATION WELL DRILLING	spill per 10^4 wells	0.439	2.036	3.421	1.502	1.796	6.965	3.936
DEVELOPMENT WELL DRILLING	spill per 10^4 wells	0.437	1.760	1.963	0.858	1.577	3.454	2.076

APPENDIX 2

Fault Tree Analysis

Table 2.1
Fault Tree Analysis Input Rationalization - Pipeline

CAUSE CLASSIFICATION	Spill Size	Shallow	Medium	Deep	Reason
		Historical Expected Frequency Change %			
CORROSION					
External	**All**	(30)	(30)	(30)	Low temperature and bio effects. Extra smart pigging.
Internal	**All**	(30)	(30)	(30)	Extra smart pigging.
THIRD PARTY IMPACT					
Anchor Impact	**All**	(50)	(50)	(50)	Low traffic.
Jackup Rig or Spud Barge	**All**	(50)	(50)	(50)	Low facility density.
Trawl/Fishing Net	**All**	(50)	(60)	(70)	Low fishing activity. Less bottom fishing in deep water.
OPERATION IMPACT					
Rig Anchoring	**All**	(20)	(20)	(20)	Low marine traffic during ice season (8 months).
Work Boat Anchoring	**All**	(20)	(20)	(20)	Low work boat traffic during ice season (8 months).
MECHANICAL					
Connection Failure	**All**				
Material Failure	**All**				
NATURAL HAZARD					
Mud Slide	**All**	(60)	(50)	(40)	Gradient low. Mud slide potential (gradient) increases with water depth.
Storm/ Hurricane	**All**	(50)	(50)	(50)	Fewer severe storms.
		Freq. Increment per 10^5 km-year			
		Expected	**Expected**	**Expected**	
		Mode	**Mode**	**Mode**	
ARCTIC					
Ice Gouging	**S**	0.3495	0.2796		Ice gouge failure rate calculated using exponential failure distribution for 2.5-m cover, 0.2-m average gouge depth, 4 gouges per km-yr flux. Spill size Distribution explained in text Section 2.5.2. Medium depth has 0.8 as many gouges as shallow.
		0.0680	0.0544		
	M	0.6178	0.4943		
		0.1210	0.0968		
	L	1.3438	1.0750		
		0.2610	0.2088		
	H	0.3762	0.3010		
		0.0730	0.0584		
Strudel Scour	**S**	0.0021			Only in shallow water. Average frequency of 4 scours/mile^2 and 100 ft of bridge length with 10% conditional P/L failure probability. The same spill size distribution as above.
		0.0012			
	M	0.0038			
		0.0020			
	L	0.0082			
		0.0045			
	H	0.0023			
		0.0012			
Upheaval Buckling	**S**	0.0004	0.0004	0.0004	All water depth. The failure frequency is 20% of that of Strudel Scour.
		0.0002	0.0002	0.0002	
	M	0.0008	0.0008	0.0008	
		0.0004	0.0004	0.0004	
	L	0.0016	0.0016	0.0016	
		0.0009	0.0009	0.0009	
	H	0.0005	0.0005	0.0005	
		0.0002	0.0002	0.0002	
Thaw Settlement	**S**	0.0002	0.0002	0.0002	All water depth. The failure frequency is 10% of that of Strudel Scour.
		0.0001	0.0001	0.0001	
	M	0.0004	0.0004	0.0004	
		0.0002	0.0002	0.0002	
	L	0.0008	0.0008	0.0008	
		0.0004	0.0004	0.0004	
	H	0.0002	0.0002	0.0002	
		0.0001	0.0001	0.0001	
Other	**S**	0.0881	0.0701	0.0002	To be assessed as 25% of above.
		0.0174	0.0137	0.0001	
	M	0.1557	0.1238	0.0003	
		0.0309	0.0244	0.0002	
	L	0.3386	0.2694	0.0006	
		0.0667	0.0525	0.0003	
	H	0.0948	0.0754	0.0002	
		0.0187	0.0147	0.0001	

Table 2.2
Monte Carlo Input - Pipeline

CAUSE CLASSIFICATION	Spill Size	Shallow			Medium			Deep		
		Frequency Change %								
		Min	Mode	Max	Min	Mode	Max	Min	Mode	Max
CORROSION										
External	**All**	(90)	(30)	(10)	(90)	(30)	(10)	(90)	(30)	(10)
Internal	**All**	(90)	(30)	(10)	(90)	(30)	(10)	(90)	(30)	(10)
THIRD PARTY IMPACT										
Anchor Impact	**All**	(90)	(50)	(10)	(90)	(50)	(10)	(90)	(50)	(10)
Jackup Rig or Spud Barge	**All**	(90)	(50)	(10)	(90)	(50)	(10)	(90)	(50)	(10)
Trawl/Fishing Net	**All**	(90)	(50)	(10)	(90)	(60)	(10)	(90)	(70)	(10)
OPERATION IMPACT										
Rig Anchoring	**All**	(50)	(20)	(10)	(50)	(20)	(10)	(50)	(20)	(10)
Work Boat Anchoring	**All**	(50)	(20)	(10)	(50)	(20)	(10)	(50)	(20)	(10)
MECHANICAL										
Connection Failure	**All**									
Material Failure	**All**									
NATURAL HAZARD										
Mud Slide	**All**	(90)	(60)	(10)	(90)	(50)	(10)	(90)	(40)	(10)
Storm/ Hurricane	**All**	(90)	(50)	(10)	(90)	(50)	(10)	(90)	(50)	(10)
		Frequency Increment per 10^5 km-year								
ARCTIC										
Ice Gouging	**S**	0.0060	0.0680	0.8290	0.0048	0.0544	0.6632			
	M	0.0090	0.1210	1.4670	0.0072	0.0968	1.1736			
	L	0.0210	0.2610	3.1900	0.0168	0.2088	2.5520			
	H	0.0060	0.0730	0.8930	0.0048	0.0584	0.7144			
Strudel Scour	**S**	0.0004	0.0012	0.0044						
	M	0.0006	0.0020	0.0078						
	L	0.0014	0.0045	0.0170						
	H	0.0004	0.0012	0.0048						
Upheaval Buckling	**S**	0.00007	0.00023	0.00088	0.00007	0.00023	0.00088	0.00007	0.00023	0.00088
	M	0.00013	0.00041	0.00156	0.00013	0.00041	0.00156	0.00013	0.00041	0.00156
	L	0.00028	0.00089	0.00340	0.00028	0.00089	0.00340	0.00028	0.00089	0.00340
	H	0.00008	0.00025	0.00095	0.00008	0.00025	0.00095	0.00008	0.00025	0.00095
Thaw Settlement	**S**	0.00004	0.00012	0.00044	0.00004	0.00012	0.00044	0.00004	0.00012	0.00044
	M	0.00006	0.00020	0.00078	0.00006	0.00020	0.00078	0.00006	0.00020	0.00078
	L	0.00014	0.00045	0.00170	0.00014	0.00045	0.00170	0.00014	0.00045	0.00170
	H	0.00004	0.00012	0.00048	0.00004	0.00012	0.00048	0.00004	0.00012	0.00048
Other	**S**	0.00162	0.01738	0.20869	0.00123	0.01369	0.16613	0.00003	0.00009	0.00033
	M	0.00246	0.03092	0.36929	0.00185	0.02435	0.29399	0.00005	0.00015	0.00059
	L	0.00571	0.06670	0.80303	0.00431	0.05253	0.63928	0.00011	0.00033	0.00128
	H	0.00163	0.01865	0.22480	0.00123	0.01469	0.17896	0.00003	0.00009	0.00036

Table 2.2A
Pipeline Arctic Spills Summary

Pipeline Spill Size	P/L Dia <10"				P/L Dia >=10"			
	Historical Frequency spills per 10^5km-year	Arctic Frequency			Historical Frequency spills per 10^5km-year	Arctic Frequency		
		Shallow	Medium	Deep		Shallow	Medium	Deep
SMALL SPILLS 50-99 bbl	5.172	3.671	3.587	3.243	3.328	2.519	2.433	2.087
MEDIUM SPILLS 100-999 bbl	9.051	6.432	6.283	5.676	8.320	5.975	5.826	5.218
LARGE SPILLS 1000-9999 bbl	5.172	4.375	4.004	2.636	9.985	6.870	6.476	5.086
HUGE SPILLS =>10000 bbl	1.293	1.144	1.041	0.659	3.328	2.200	2.087	1.695

Table 2.3
Arctic Spill Distribution and Frequency - P/L - Small Spills

CAUSE CLASSIFICATION	HIST. DISTRIBUTION %	SMALL SPILLS 50-99 bbl																				
		P/L Dia <10"										P/L Dia >=10"										
			Shallow			Medium			Deep				Shallow			Medium			Deep			
		FREQUENCY spills per 10^5km-year	Frequency Change	New Frequency	New Distribution %	Frequency Change	New Frequency	New Distribution %	Frequency Change	New Frequency	New Distribution %	FREQUENCY spills per 10^5km-year	Frequency Change	New Frequency	New Distribution %	Frequency Change	New Frequency	New Distribution %	Frequency Change	New Frequency	New Distribution %
CORROSION	**16.67**	**0.862**	**(0.396)**	**0.466**	**12.70**	**(0.396)**	**0.466**	**13.00**	**(0.396)**	**0.466**	**14.38**	**0.555**	**(0.255)**	**0.300**	**11.91**	**(0.255)**	**0.300**	**12.33**	**(0.255)**	**0.300**	**14.38**
External	5.56	0.287	(0.132)	0.155	4.23	(0.132)	0.155	4.33	(0.132)	0.155	4.79	0.185	(0.085)	0.100	3.97	(0.085)	0.100	4.11	(0.085)	0.100	4.79
Internal	11.11	0.575	(0.264)	0.311	8.47	(0.264)	0.311	8.67	(0.264)	0.311	9.58	0.370	(0.170)	0.200	7.94	(0.170)	0.200	8.22	(0.170)	0.200	9.58
THIRD PARTY IMPACT	**38.89**	**2.011**	**(1.006)**	**1.006**	**27.40**	**(1.012)**	**1.000**	**27.87**	**(1.017)**	**0.994**	**30.64**	**1.294**	**(0.647)**	**0.647**	**25.69**	**(0.651)**	**0.643**	**26.44**	**(0.655)**	**0.640**	**30.64**
Anchor Impact	33.33	1.724	(0.862)	0.862	23.48	(0.862)	0.862	24.03	(0.862)	0.862	26.58	1.109	(0.555)	0.555	22.02	(0.555)	0.555	22.80	(0.555)	0.555	26.57
Jackup Rig or Spud Barge																					
Trawl/Fishing Net	5.56	0.287	(0.144)	0.144	3.91	(0.150)	0.138	3.84	(0.155)	0.132	4.07	0.185	(0.092)	0.092	3.67	(0.096)	0.089	3.64	(0.100)	0.085	4.07
OPERATION IMPACT	**16.67**	**0.862**	**(0.241)**	**0.621**	**16.92**	**(0.241)**	**0.621**	**17.32**	**(0.241)**	**0.621**	**19.15**	**0.555**	**(0.155)**	**0.400**	**15.86**	**(0.155)**	**0.400**	**16.43**	**(0.155)**	**0.400**	**19.15**
Rig Anchoring	5.56	0.287	(0.080)	0.207	5.64	(0.080)	0.207	5.77	(0.080)	0.207	6.38	0.185	(0.052)	0.133	5.29	(0.052)	0.133	5.48	(0.052)	0.133	6.38
Work Boat Anchoring	11.11	0.575	(0.161)	0.414	11.28	(0.161)	0.414	11.54	(0.161)	0.414	12.77	0.370	(0.103)	0.266	10.58	(0.103)	0.266	10.95	(0.103)	0.266	12.76
MECHANICAL	**11.11**	**0.575**		**0.575**	**15.66**		**0.575**	**16.02**		**0.575**	**17.72**	**0.370**		**0.370**	**14.68**		**0.370**	**15.20**		**0.370**	**17.72**
Connection Failure	5.56	0.287		0.287	7.83		0.287	8.01		0.287	8.86	0.185		0.185	7.34		0.185	7.60		0.185	8.86
Material Failure	5.56	0.287		0.287	7.83		0.287	8.01		0.287	8.86	0.185		0.185	7.34		0.185	7.60		0.185	8.86
NATURAL HAZARD	**11.11**	**0.575**	**(0.299)**	**0.275**	**7.50**	**(0.287)**	**0.287**	**8.01**	**(0.275)**	**0.299**	**9.23**	**0.370**	**(0.193)**	**0.177**	**7.04**	**(0.185)**	**0.185**	**7.60**	**(0.177)**	**0.193**	**9.23**
Mud Slide	11.11	0.575	(0.299)	0.275	7.50	(0.287)	0.287	8.01	(0.275)	0.299	9.23	0.370	(0.193)	0.177	7.04	(0.185)	0.185	7.60	(0.177)	0.193	9.23
Storm/ Hurricane																					
ARCTIC			**0.440**	**0.440**	**12.00**	**0.350**	**0.350**	**9.77**	**0.001**	**0.001**	**0.02**		**0.440**	**0.440**	**17.48**	**0.350**	**0.350**	**14.40**	**0.001**	**0.001**	**0.04**
Ice Gouging			0.3495	0.3495	9.52	0.2796	0.2796	7.80					0.3495	0.3495	13.87	0.2796	0.2796	11.49			
Strudel Scour			0.0021	0.0021	0.06								0.0021	0.0021	0.09						
Upheaval Buckling			0.0004	0.0004	0.01	0.0004	0.0004	0.01	0.0004	0.0004	0.01		0.0004	0.0004	0.02	0.0004	0.0004	0.02	0.0004	0.0004	0.02
Thaw Settlement			0.0002	0.0002	0.01	0.0002	0.0002	0.01	0.0002	0.0002	0.01		0.0002	0.0002	0.01	0.0002	0.0002	0.01	0.0002	0.0002	0.01
Other			0.0881	0.0881	2.40	0.0701	0.0701	1.95	0.0002	0.0002	0.00		0.0881	0.0881	3.50	0.0701	0.0701	2.88	0.0002	0.0002	0.01
UNKNOWN	**5.56**	**0.287**		**0.287**	**7.83**		**0.287**	**8.01**		**0.287**	**8.86**	**0.185**		**0.185**	**7.34**		**0.185**	**7.60**		**0.185**	**8.86**
TOTALS	**100.00**	**5.172**	**(1.501)**	**3.671**	**100.00**	**(1.585)**	**3.587**	**100.00**	**(1.929)**	**3.243**	**100.00**	**3.328**	**(0.809)**	**2.519**	**100.00**	**(0.895)**	**2.433**	**100.00**	**(1.241)**	**2.087**	**100.00**

Table 2.4
Arctic Spill Distribution and Frequency - P/L - Medium Spills

CAUSE CLASSIFICATION	HIST. DISTRIBUTION %	MEDIUM SPILLS 100-999 bbl																			
		P/L Dia <10"										P/L Dia >=10"									
			Shallow			Medium			Deep				Shallow			Medium			Deep		
		FREQUENCY spills per 10^5km-year	Frequency Change	New Frequency	New Distribution %	Frequency Change	New Frequency	New Distribution %	Frequency Change	New Frequency	New Distribution %	FREQUENCY spills per 10^5km-year	Frequency Change	New Frequency	New Distribution %	Frequency Change	New Frequency	New Distribution %	Frequency Change	New Frequency	New Distribution %
CORROSION	**16.67**	**1.509**	**(0.692)**	**0.816**	**12.69**	**(0.692)**	**0.816**	**12.99**	**(0.692)**	**0.816**	**14.38**	**1.387**	**(0.637)**	**0.750**	**12.55**	**(0.637)**	**0.750**	**12.88**	**(0.637)**	**0.750**	**14.38**
External	5.56	0.503	(0.231)	0.272	4.23	(0.231)	0.272	4.33	(0.231)	0.272	4.79	0.462	(0.212)	0.250	4.18	(0.212)	0.250	4.29	(0.212)	0.250	4.79
Internal	11.11	1.006	(0.462)	0.544	8.46	(0.462)	0.544	8.66	(0.462)	0.544	9.58	0.924	(0.424)	0.500	8.37	(0.424)	0.500	8.58	(0.424)	0.500	9.58
THIRD PARTY IMPACT	**38.89**	**3.520**	**(1.760)**	**1.760**	**27.36**	**(1.770)**	**1.749**	**27.85**	**(1.781)**	**1.739**	**30.64**	**3.236**	**(1.618)**	**1.618**	**27.08**	**(1.627)**	**1.608**	**27.61**	**(1.637)**	**1.599**	**30.64**
Anchor Impact	33.33	3.017	(1.509)	1.509	23.45	(1.509)	1.509	24.01	(1.509)	1.509	26.58	2.773	(1.387)	1.387	23.21	(1.387)	1.387	23.80	(1.387)	1.387	26.58
Jackup Rig or Spud Barge																					
Trawl/Fishing Net	5.56	0.503	(0.251)	0.251	3.91	(0.262)	0.241	3.84	(0.272)	0.231	4.07	0.462	(0.231)	0.231	3.87	(0.241)	0.222	3.80	(0.250)	0.212	4.07
OPERATION IMPACT	**16.67**	**1.509**	**(0.422)**	**1.087**	**16.90**	**(0.422)**	**1.087**	**17.30**	**(0.422)**	**1.087**	**19.15**	**1.387**	**(0.388)**	**0.999**	**16.72**	**(0.388)**	**0.999**	**17.15**	**(0.388)**	**0.999**	**19.15**
Rig Anchoring	5.56	0.503	(0.141)	0.362	5.63	(0.141)	0.362	5.77	(0.141)	0.362	6.38	0.462	(0.129)	0.333	5.57	(0.129)	0.333	5.72	(0.129)	0.333	6.38
Work Boat Anchoring	11.11	1.006	(0.281)	0.725	11.27	(0.281)	0.725	11.53	(0.281)	0.725	12.77	0.924	(0.258)	0.666	11.15	(0.258)	0.666	11.43	(0.258)	0.666	12.77
MECHANICAL	**11.11**	**1.006**		**1.006**	**15.64**		**1.006**	**16.01**		**1.006**	**17.72**	**0.924**		**0.924**	**15.47**		**0.924**	**15.87**		**0.924**	**17.72**
Connection Failure	5.56	0.503		0.503	7.82		0.503	8.00		0.503	8.86	0.462		0.462	7.74		0.462	7.93		0.462	8.86
Material Failure	5.56	0.503		0.503	7.82		0.503	8.00		0.503	8.86	0.462		0.462	7.74		0.462	7.93		0.462	8.86
NATURAL HAZARD	**11.11**	**1.006**	**(0.524)**	**0.482**	**7.49**	**(0.503)**	**0.503**	**8.00**	**(0.482)**	**0.524**	**9.23**	**0.924**	**(0.481)**	**0.443**	**7.42**	**(0.462)**	**0.462**	**7.93**	**(0.443)**	**0.481**	**9.23**
Mud Slide	11.11	1.006	(0.524)	0.482	7.49	(0.503)	0.503	8.00	(0.482)	0.524	9.23	0.924	(0.481)	0.443	7.42	(0.462)	0.462	7.93	(0.443)	0.481	9.23
Storm/ Hurricane																					
ARCTIC			**0.778**	**0.778**	**12.10**	**0.619**	**0.619**	**9.86**	**0.001**	**0.001**	**0.03**		**0.778**	**0.778**	**13.03**	**0.619**	**0.619**	**10.63**	**0.001**	**0.001**	**0.03**
Ice Gouging			0.6178	0.6178	9.61	0.4943	0.4943	7.87					0.6178	0.6178	10.34	0.4943	0.4943	8.48			
Strudel Scour			0.0038	0.0038	0.06								0.0038	0.0038	0.06						
Upheaval Buckling			0.0008	0.0008	0.01	0.0008	0.0008	0.01	0.0008	0.0008	0.01		0.0008	0.0008	0.01	0.0008	0.0008	0.01	0.0008	0.0008	0.01
Thaw Settlement			0.0004	0.0004	0.01	0.0004	0.0004	0.01	0.0004	0.0004	0.01		0.0004	0.0004	0.01	0.0004	0.0004	0.01	0.0004	0.0004	0.01
Other			0.1557	0.1557	2.42	0.1238	0.1238	1.97	0.0003	0.0003	0.01		0.1557	0.1557	2.61	0.1238	0.1238	2.13	0.0003	0.0003	0.01
UNKNOWN	**5.56**	**0.503**		**0.503**	**7.82**		**0.503**	**8.00**		**0.503**	**8.86**	**0.462**		**0.462**	**7.74**		**0.462**	**7.93**		**0.462**	**8.86**
TOTALS	**100.00**	**9.051**	**(2.619)**	**6.432**	**100.00**	**(2.768)**	**6.283**	**100.00**	**(3.375)**	**5.676**	**100.00**	**8.320**	**(2.345)**	**5.975**	**100.00**	**(2.495)**	**5.826**	**100.00**	**(3.103)**	**5.218**	**100.00**

Table 2.5
Arctic Spill Distribution and Frequency - P/L - Large Spills

CAUSE CLASSIFICATION	HIST. DISTRIBUTION %	LARGE SPILLS 1000-9999 bbl																			
		P/L Dia <10"										P/L Dia >=10"									
			Shallow			Medium			Deep				Shallow			Medium			Deep		
		FREQUENCY spills per 10^5km-year	Frequency Change	New Frequency	New Distribution %	Frequency Change	New Frequency	New Distribution %	Frequency Change	New Frequency	New Distribution %	FREQUENCY spills per 10^5km-year	Frequency Change	New Frequency	New Distribution %	Frequency Change	New Frequency	New Distribution %	Frequency Change	New Frequency	New Distribution %
CORROSION	**7.69**	**0.398**	**(0.183)**	**0.215**	**4.92**	**(0.183)**	**0.215**	**5.38**	**(0.183)**	**0.215**	**8.16**	**0.768**	**(0.353)**	**0.415**	**6.05**	**(0.353)**	**0.415**	**6.42**	**(0.353)**	**0.415**	**8.17**
External																					
Internal	7.69	0.398	(0.183)	0.215	4.92	(0.183)	0.215	5.38	(0.183)	0.215	8.16	0.768	(0.353)	0.415	6.05	(0.353)	0.415	6.42	(0.353)	0.415	8.17
THIRD PARTY IMPACT	**69.23**	**3.581**	**(1.790)**	**1.790**	**40.92**	**(1.823)**	**1.757**	**43.89**	**(1.855)**	**1.725**	**65.44**	**6.912**	**(3.456)**	**3.456**	**50.31**	**(3.520)**	**3.393**	**52.38**	**(3.582)**	**3.330**	**65.48**
Anchor Impact	30.77	1.591	(0.796)	0.796	18.19	(0.796)	0.796	19.87	(0.796)	0.796	30.18	3.072	(1.536)	1.536	22.36	(1.536)	1.536	23.72	(1.536)	1.536	30.20
Jackup Rig or Spud Barge	7.69	0.398	(0.199)	0.199	4.55	(0.199)	0.199	4.97	(0.199)	0.199	7.55	0.768	(0.384)	0.384	5.59	(0.384)	0.384	5.93	(0.384)	0.384	7.55
Trawl/Fishing Net	30.77	1.591	(0.796)	0.796	18.19	(0.829)	0.763	19.05	(0.861)	0.731	27.71	3.072	(1.536)	1.536	22.36	(1.600)	1.472	22.74	(1.662)	1.410	27.73
OPERATION IMPACT	**7.69**	**0.398**	**(0.111)**	**0.287**	**6.55**	**(0.111)**	**0.287**	**7.16**	**(0.111)**	**0.287**	**10.87**	**0.768**	**(0.215)**	**0.553**	**8.05**	**(0.215)**	**0.553**	**8.54**	**(0.215)**	**0.553**	**10.88**
Rig Anchoring																					
Work Boat Anchoring	7.69	0.398	(0.111)	0.287	6.55	(0.111)	0.287	7.16	(0.111)	0.287	10.87	0.768	(0.215)	0.553	8.05	(0.215)	0.553	8.54	(0.215)	0.553	10.88
MECHANICAL																					
Connection Failure																					
Material Failure																					
NATURAL HAZARD	**15.38**	**0.796**	**(0.406)**	**0.390**	**8.91**	**(0.398)**	**0.398**	**9.94**	**(0.390)**	**0.406**	**15.40**	**1.536**	**(0.784)**	**0.752**	**10.95**	**(0.768)**	**0.768**	**11.86**	**(0.752)**	**0.784**	**15.41**
Mud Slide	7.69	0.398	(0.207)	0.191	4.36	(0.199)	0.199	4.97	(0.191)	0.207	7.86	0.768	(0.400)	0.368	5.36	(0.384)	0.384	5.93	(0.368)	0.400	7.86
Storm/ Hurricane	7.69	0.398	(0.199)	0.199	4.55	(0.199)	0.199	4.97	(0.199)	0.199	7.55	0.768	(0.384)	0.384	5.59	(0.384)	0.384	5.93	(0.384)	0.384	7.55
ARCTIC			**1.693**	**1.693**	**38.70**	**1.347**	**1.347**	**33.64**	**0.003**	**0.003**	**0.12**		**1.693**	**1.693**	**24.64**	**1.347**	**1.347**	**20.80**	**0.003**	**0.003**	**0.06**
Ice Gouging			1.3438	1.3438	30.72	1.0750	1.0750	26.85					1.3438	1.3438	19.56	1.0750	1.0750	16.60			
Strudel Scour			0.0082	0.0082	0.19								0.0082	0.0082	0.12						
Upheaval Buckling			0.0016	0.0016	0.04	0.0016	0.0016	0.04	0.0016	0.0016	0.06		0.0016	0.0016	0.02	0.0016	0.0016	0.03	0.0016	0.0016	0.03
Thaw Settlement			0.0008	0.0008	0.02	0.0008	0.0008	0.02	0.0008	0.0008	0.03		0.0008	0.0008	0.01	0.0008	0.0008	0.01	0.0008	0.0008	0.02
Other			0.3386	0.3386	7.74	0.2694	0.2694	6.73	0.0006	0.0006	0.02		0.3386	0.3386	4.93	0.2694	0.2694	4.16	0.0006	0.0006	0.01
UNKNOWN																					
TOTALS	**100.00**	**5.172**	**(0.797)**	**4.375**	**100.00**	**(1.168)**	**4.004**	**100.00**	**(2.536)**	**2.636**	**100.00**	**9.985**	**(3.114)**	**6.870**	**100.00**	**(3.508)**	**6.476**	**100.00**	**(4.898)**	**5.086**	**100.00**

Table 2.6
Arctic Spill Distribution and Frequency - P/L - Huge Spills

CAUSE CLASSIFICATION	HIST. DISTRIBUTION %	HUGE SPILLS =>10000 bbl																				
		P/L Dia <10"										P/L Dia >=10"										
			Shallow			Medium			Deep				Shallow			Medium			Deep		
		FREQUENCY spills per 10^5km-year	Frequency Change	New Frequency	New Distribution %	Frequency Change	New Frequency	New Distribution %	Frequency Change	New Frequency	New Distribution %	FREQUENCY spills per 10^5km-year	Frequency Change	New Frequency	New Distribution %	Frequency Change	New Frequency	New Distribution %	Frequency Change	New Frequency	New Distribution %
CORROSION	**7.69**	**0.099**	**(0.046)**	**0.054**	**4.70**	**(0.046)**	**0.054**	**5.17**	**(0.046)**	**0.054**	**8.16**	**0.256**	**(0.118)**	**0.138**	**6.30**	**(0.118)**	**0.138**	**6.64**	**(0.118)**	**0.138**	**8.17**
External																					
Internal	7.69	0.099	(0.046)	0.054	4.70	(0.046)	0.054	5.17	(0.046)	0.054	8.16	0.256	(0.118)	0.138	6.30	(0.118)	0.138	6.64	(0.118)	0.138	8.17
THIRD PARTY IMPACT	**69.23**	**0.895**	**(0.448)**	**0.448**	**39.11**	**(0.456)**	**0.439**	**42.19**	**(0.464)**	**0.431**	**65.43**	**2.304**	**(1.152)**	**1.152**	**52.37**	**(1.173)**	**1.131**	**54.19**	**(1.194)**	**1.110**	**65.48**
Anchor Impact	30.77	0.398	(0.199)	0.199	17.38	(0.199)	0.199	19.10	(0.199)	0.199	30.18	1.024	(0.512)	0.512	23.28	(0.512)	0.512	24.54	(0.512)	0.512	30.20
Jackup Rig or Spud Barge	7.69	0.099	(0.050)	0.050	4.35	(0.050)	0.050	4.78	(0.050)	0.050	7.54	0.256	(0.128)	0.128	5.82	(0.128)	0.128	6.13	(0.128)	0.128	7.55
Trawl/Fishing Net	30.77	0.398	(0.199)	0.199	17.38	(0.207)	0.191	18.31	(0.215)	0.183	27.71	1.024	(0.512)	0.512	23.28	(0.533)	0.491	23.52	(0.554)	0.470	27.73
OPERATION IMPACT	**7.69**	**0.099**	**(0.028)**	**0.072**	**6.26**	**(0.028)**	**0.072**	**6.88**	**(0.028)**	**0.072**	**10.87**	**0.256**	**(0.072)**	**0.184**	**8.39**	**(0.072)**	**0.184**	**8.84**	**(0.072)**	**0.184**	**10.88**
Rig Anchoring																					
Work Boat Anchoring	7.69	0.099	(0.028)	0.072	6.26	(0.028)	0.072	6.88	(0.028)	0.072	10.87	0.256	(0.072)	0.184	8.39	(0.072)	0.184	8.84	(0.072)	0.184	10.88
MECHANICAL																					
Connection Failure																					
Material Failure																					
NATURAL HAZARD	**15.38**	**0.199**	**(0.102)**	**0.097**	**8.51**	**(0.099)**	**0.099**	**9.55**	**(0.097)**	**0.102**	**15.40**	**0.512**	**(0.261)**	**0.251**	**11.40**	**(0.256)**	**0.256**	**12.27**	**(0.251)**	**0.261**	**15.41**
Mud Slide	7.69	0.099	(0.052)	0.048	4.17	(0.050)	0.050	4.78	(0.048)	0.052	7.86	0.256	(0.133)	0.123	5.58	(0.128)	0.128	6.13	(0.123)	0.133	7.86
Storm/ Hurricane	7.69	0.099	(0.050)	0.050	4.35	(0.050)	0.050	4.78	(0.050)	0.050	7.54	0.256	(0.128)	0.128	5.82	(0.128)	0.128	6.13	(0.128)	0.128	7.55
ARCTIC			**0.474**	**0.474**	**41.42**	**0.377**	**0.377**	**36.21**	**0.001**	**0.001**	**0.13**		**0.474**	**0.474**	**21.55**	**0.377**	**0.377**	**18.07**	**0.001**	**0.001**	**0.05**
Ice Gouging			0.3762	0.3762	32.87	0.3010	0.3010	28.90					0.3762	0.3762	17.10	0.3010	0.3010	14.42			
Strudel Scour			0.0023	0.0023	0.20								0.0023	0.0023	0.10						
Upheaval Buckling			0.0005	0.0005	0.04	0.0005	0.0005	0.04	0.0005	0.0005	0.07		0.0005	0.0005	0.02	0.0005	0.0005	0.02	0.0005	0.0005	0.03
Thaw Settlement			0.0002	0.0002	0.02	0.0002	0.0002	0.02	0.0002	0.0002	0.03		0.0002	0.0002	0.01	0.0002	0.0002	0.01	0.0002	0.0002	0.01
Other			0.0948	0.0948	8.28	0.0754	0.0754	7.24	0.0002	0.0002	0.03		0.0948	0.0948	4.31	0.0754	0.0754	3.61	0.0002	0.0002	0.01
UNKNOWN																					
TOTALS	**100.00**	**1.293**	**(0.149)**	**1.144**	**100.00**	**(0.252)**	**1.041**	**100.00**	**(0.634)**	**0.659**	**100.00**	**3.328**	**(1.128)**	**2.200**	**100.00**	**(1.241)**	**2.087**	**100.00**	**(1.633)**	**1.695**	**100.00**

Table 2.7
FTA Input Rationalization - Platforms

CAUSE CLASSIFICATION	Spill Size	Historical Expected Frequency Change %			Reason
		Shallow	Medium	Deep	
PROCESS FACILITY RLS.	**All**	(30)	(30)	(30)	State of the art now, High QC, High Inspection and Maintenance Requirements
STORAGE TANK RLS.	**All**	(30)	(30)	(30)	State of the art now, High QC, High Inspection and Maintenance Requirements
STRUCTURAL FAILURE	**All**	(20)	(20)	(20)	High safety factor, Monitoring Programs
HURRICANE/STORM	**All**	(50)	(40)	(30)	Less severe storms. More intensity in deep water.
COLLISION	**All**	(50)	(50)	(50)	Very low traffic density.
		Freq. Increment per 10^4 well-year			
		Expected	**Expected**	**Expected**	
		Mode	**Mode**	**Mode**	
ARCTIC					
Ice Force	**SM**	0.1447	0.2170	0.3256	Assumed 10,000 year return period ice force causes spill 4% of occurences (96% reliability). 85% of the spills are SM.
		0.0340	0.0510	0.0765	
	LH	0.0255	0.0383	0.0575	
		0.0060	0.0090	0.0135	
Facility Low Temperature	**SM**	0.1000	0.1000	0.1000	Assumed fraction of Historical Process Facilities release frequency with 6% for SM anfd 3% for LH spill sizes.
		0.1000	0.1000	0.1000	
	LH	0.0080	0.0080	0.0080	
		0.0080	0.0080	0.0080	
Other	**SM**	0.0244	0.0316	0.0424	10% of sum of above.
		0.0134	0.0151	0.0177	
	LH	0.0033	0.0046	0.0065	
		0.0014	0.0017	0.0022	

Table 2.8
Monte Carlo Input - Platforms

CAUSE CLASSIFICATION	Spill Size	Shallow			Medium			Deep		
		Frequency Change %								
		Min	Mode	Max	Min	Mode	Max	Min	Mode	Max
PROCESS FACILITY RLS.	**All**	(60)	(30)	(10)	(60)	(30)	(10)	(60)	(30)	(10)
STORAGE TANK RLS.	**All**	(60)	(30)	(10)	(60)	(30)	(10)	(60)	(30)	(10)
STRUCTURAL FAILURE	**All**	(60)	(20)	(10)	(60)	(20)	(10)	(60)	(20)	(10)
HURRICANE/STORM	**All**	(90)	(50)	(10)	(90)	(40)	(10)	(90)	(30)	(10)
COLLISION	**All**	(90)	(50)	(10)	(90)	(50)	(10)	(90)	(50)	(10)
		Frequency Increment per 10^4 well-year								
ARCTIC										
Ice Force	**SM**	0.003	0.034	0.340	0.005	0.051	0.510	0.008	0.077	0.765
	LH	0.001	0.006	0.060	0.001	0.009	0.090	0.001	0.014	0.135
Facility Low Temperature	**SM**	0.050	0.100	0.150	0.050	0.100	0.150	0.050	0.100	0.150
	LH	0.004	0.008	0.012	0.004	0.008	0.012	0.004	0.008	0.012
Other	**SM**	0.005	0.013	0.049	0.006	0.015	0.066	0.006	0.018	0.092
	LH	0.000	0.001	0.007	0.000	0.002	0.010	0.001	0.002	0.015

Table 2.8A
Platforms Arctic Spill Summary

Platform Spill Size	Historical Frequency spills per 10^4km-year	Arctic Frequency		
		Shallow	Medium	Deep
SMALL AND MEDIUM SPILLS 50-999 bbl	2.157	1.619	1.704	1.828
LARGE AND HUGE SPILLS =>1000 bbl	0.360	0.274	0.288	0.309

Table 2.9
Arctic Spill Distribution and Frequency - Platforms - Small and Medium Spills

CAUSE CLASSIFICATION	HIST. DISTRIBUTION %	SMALL AND MEDIUM SPILLS 50-999 bbl										
		FREQUENCY spills per 10^4 well-year	Shallow			Medium			Deep		
			Frequency Change	New Frequency	New Distribution %	Frequency Change	New Frequency	New Distribution %	Frequency Change	New Frequency	New Distribution %
PROCESS FACILITY RLS.	**66.67**	**1.438**	**(0.488)**	**0.950**	**58.65**	**(0.488)**	**0.950**	**55.74**	**(0.488)**	**0.950**	**51.96**
STORAGE TANK RLS.	**5.56**	**0.120**	**(0.041)**	**0.079**	**4.89**	**(0.041)**	**0.079**	**4.65**	**(0.041)**	**0.079**	**4.33**
STRUCTURAL FAILURE	**5.56**	**0.120**	**(0.038)**	**0.082**	**5.04**	**(0.038)**	**0.082**	**4.79**	**(0.038)**	**0.082**	**4.46**
HURRICANE/STORM	**11.11**	**0.240**	**(0.120)**	**0.120**	**7.40**	**(0.115)**	**0.125**	**7.33**	**(0.110)**	**0.130**	**7.09**
COLLISION	**11.11**	**0.240**	**(0.120)**	**0.120**	**7.40**	**(0.120)**	**0.120**	**7.03**	**(0.120)**	**0.120**	**6.56**
ARCTIC			**0.269**	**0.269**	**16.62**	**0.349**	**0.349**	**20.46**	**0.468**	**0.468**	**25.60**
Ice Force			0.145	0.145	8.94	0.217	0.217	12.74	0.326	0.326	17.81
Facility Low Temperature			0.100	0.100	6.18	0.100	0.100	5.87	0.100	0.100	5.47
Other			0.024	0.024	1.51	0.032	0.032	1.86	0.042	0.042	2.32
TOTALS	**100.00**	**2.157**	**(0.538)**	**1.619**	**100.00**	**(0.453)**	**1.704**	**100.00**	**(0.329)**	**1.828**	**100.00**

Table 2.10
Arctic Spill Distribution and Frequency - Platforms - Large and Huge Spills

CAUSE CLASSIFICATION	HIST. DISTRIBUTION %	LARGE AND HUGE SPILLS =>1000 bbl									
		FREQUENCY spills per 10^4 well-year	Shallow			Medium			Deep		
			Frequency Change	New Frequency	New Distribution %	Frequency Change	New Frequency	New Distribution %	Frequency Change	New Frequency	New Distribution %
PROCESS FACILITY RLS.	**33.33**	**0.120**	**(0.041)**	**0.079**	**28.85**	**(0.041)**	**0.079**	**27.45**	**(0.041)**	**0.079**	**25.58**
STORAGE TANK RLS.	**66.67**	**0.240**	**(0.081)**	**0.158**	**57.70**	**(0.081)**	**0.158**	**54.89**	**(0.081)**	**0.158**	**51.16**
STRUCTURAL FAILURE											
HURRICANE/STORM											
COLLISION											
ARCTIC			**0.037**	**0.037**	**13.44**	**0.051**	**0.051**	**17.66**	**0.072**	**0.072**	**23.27**
Ice Force			0.026	0.026	9.31	0.038	0.038	13.28	0.057	0.057	18.57
Facility Low Temperature			0.008	0.008	2.92	0.008	0.008	2.77	0.008	0.008	2.59
Other			0.003	0.003	1.22	0.005	0.005	1.60	0.007	0.007	2.11
TOTALS	**100.00**	**0.360**	**(0.085)**	**0.274**	**100.00**	**(0.071)**	**0.288**	**100.00**	**(0.050)**	**0.309**	**100.00**

Table 2.11
Monte Carlo Input - Wells

EVENT	FREQUENCY UNIT	Historical Expected Frequency Change %			Reason
		Shallow	Medium	Deep	
		Small and Medium Spills 50-999 bbl			
PRODUCTION WELL	spill per 10^4 well-year	(30)	(30)	(30)	State of the art now, High QC, High Inspection and Maintenance Requirements
EXPLORATION WELL DRILLING	spill per 10^4 wells	(30)	(20)	(10)	Highly qualified drilling contractor. Better logistics support in shallow water.
DEVELOPMENT WELL DRILLING	spill per 10^4 wells	(30)	(20)	(10)	Highly qualified drilling contractor. Better logistics support in shallow water.
		Large Spills 1000-9999 bbl			
PRODUCTION WELL	spill per 10^4 well-year	(30)	(30)	(30)	
EXPLORATION WELL DRILLING	spill per 10^4 wells	(30)	(20)	(10)	
DEVELOPMENT WELL DRILLING	spill per 10^4 wells	(30)	(20)	(10)	
		Spill 10000-149999 bbl			
PRODUCTION WELL	spill per 10^4 well-year	(30)	(30)	(30)	
EXPLORATION WELL DRILLING	spill per 10^4 wells	(30)	(20)	(10)	
DEVELOPMENT WELL DRILLING	spill per 10^4 wells	(30)	(20)	(10)	
		Spill >=150000 bbl			
PRODUCTION WELL	spill per 10^4 well-year	(30)	(30)	(30)	
EXPLORATION WELL DRILLING	spill per 10^4 wells	(30)	(20)	(10)	
DEVELOPMENT WELL DRILLING	spill per 10^4 wells	(30)	(20)	(10)	

Table 2.12
Arctic Spill Distribution and Frequency - Wells

EVENT	FREQUENCY UNIT	HISTORICAL FREQUENCY	Shallow		Medium		Deep	
			Frequency Change	New Frequency	Frequency Change	New Frequency	Frequency Change	New Frequency
		Small and Medium Spills 50-999 bbl						
PRODUCTION WELL	spill per 10^4 well-year	0.147	-0.044	0.103	-0.044	0.103	-0.044	0.103
EXPLORATION WELL DRILLING	spill per 10^4 wells	2.262	-0.678	1.583	-0.452	1.809	-0.226	2.035
DEVELOPMENT WELL DRILLING	spill per 10^4 wells	0.692	-0.208	0.484	-0.138	0.554	-0.069	0.623
		Large Spills 1000-9999 bbl						
PRODUCTION WELL	spill per 10^4 well-year	1.026	-0.308	0.718	-0.308	0.718	-0.308	0.718
EXPLORATION WELL DRILLING	spill per 10^4 wells	15.824	-4.747	11.077	-3.165	12.659	-1.582	14.242
DEVELOPMENT WELL DRILLING	spill per 10^4 wells	4.833	-1.450	3.383	-0.967	3.867	-0.483	4.350
		Spills 10000-149999 bbl						
PRODUCTION WELL	spill per 10^4 well-year	0.440	-0.132	0.308	-0.132	0.308	-0.132	0.308
EXPLORATION WELL DRILLING	spill per 10^4 wells	6.799	-2.040	4.759	-1.360	5.439	-0.680	6.119
DEVELOPMENT WELL DRILLING	spill per 10^4 wells	2.076	-0.623	1.453	-0.415	1.661	-0.208	1.868
		Spills >=150000 bbl						
PRODUCTION WELL	spill per 10^4 well-year	0.293	-0.088	0.205	-0.088	0.205	-0.088	0.205
EXPLORATION WELL DRILLING	spill per 10^4 wells	3.936	-1.181	2.755	-0.787	3.149	-0.394	3.543
DEVELOPMENT WELL DRILLING	spill per 10^4 wells	2.076	-0.623	1.453	-0.415	1.661	-0.208	1.868

Table 2.13
Spill Volume Distributions

	PIPELINE SPILL VOLUMES															
Spill Size	Small Spills 50-99 bbl				Medium Spills 100-999 bbl				Large Spills 1000-9999 bbl				Huge Spills =>10000 bbl			
Spill Expectation	Low	Mode	High	Expected	Low	Mode	High	Expected	Low	Mode	High	Expected	Low	Mode	High	Expected
P/L Dia <10" Spill	50	58	99	71	100	226	999	485	1000	4436	9999	5279	10000	14423	20000	14880
P/L Dia > 10" Spill	50	58	99	71	100	387	999	516	1000	3932	9999	5176	10000	17705	20000	15552

	PLATFORM SPILL VOLUMES							
Spill Size	Small and Medium Spills 50-999 bbl				Large and Huge Spills =>1000 bbl			
Spill Expectation	Low	Mode	High	Expected	Low	Mode	High	Expected
Platform Spill	50	158	999	452	1000	6130	10000	5631

	WELL SPILL VOLUMES															
Spill Size	Small and Medium Spills 50-999 bbl				Large Spills 1000-9999 bbl				Spills 10000-149999 bbl				Spills =>150000 bbl			
Spill Expectation	Low	Mode	High	Expected	Low	Mode	High	Expected	Low	Mode	High	Expected	Low	Mode	High	Expected
Well Spill	50	500	999	519	1000	4500	9999	5292	10000	20000	150000	68349	150000	200000	250000	200000

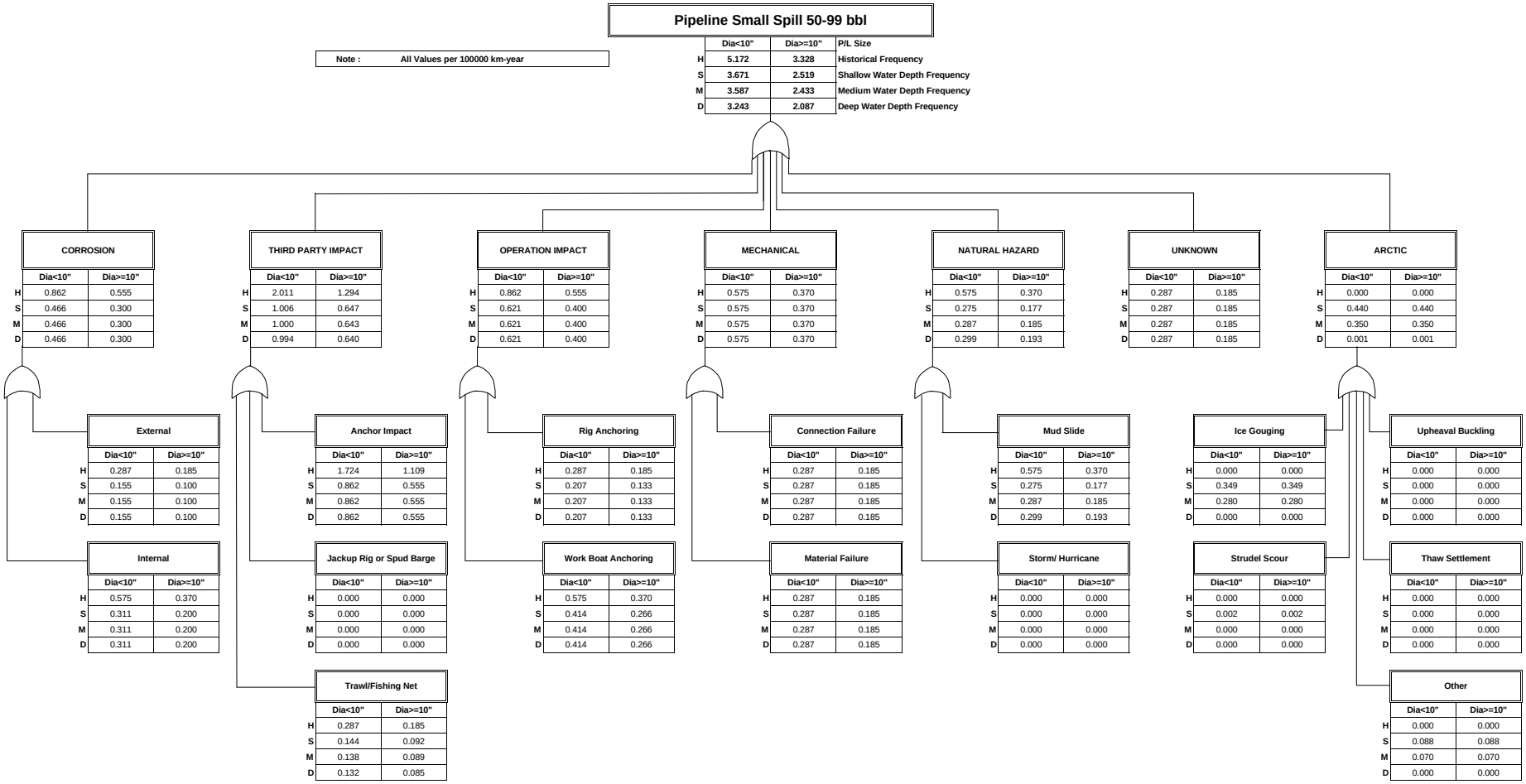


Figure 2.1 Fault Tree - Pipeline - Small Spills

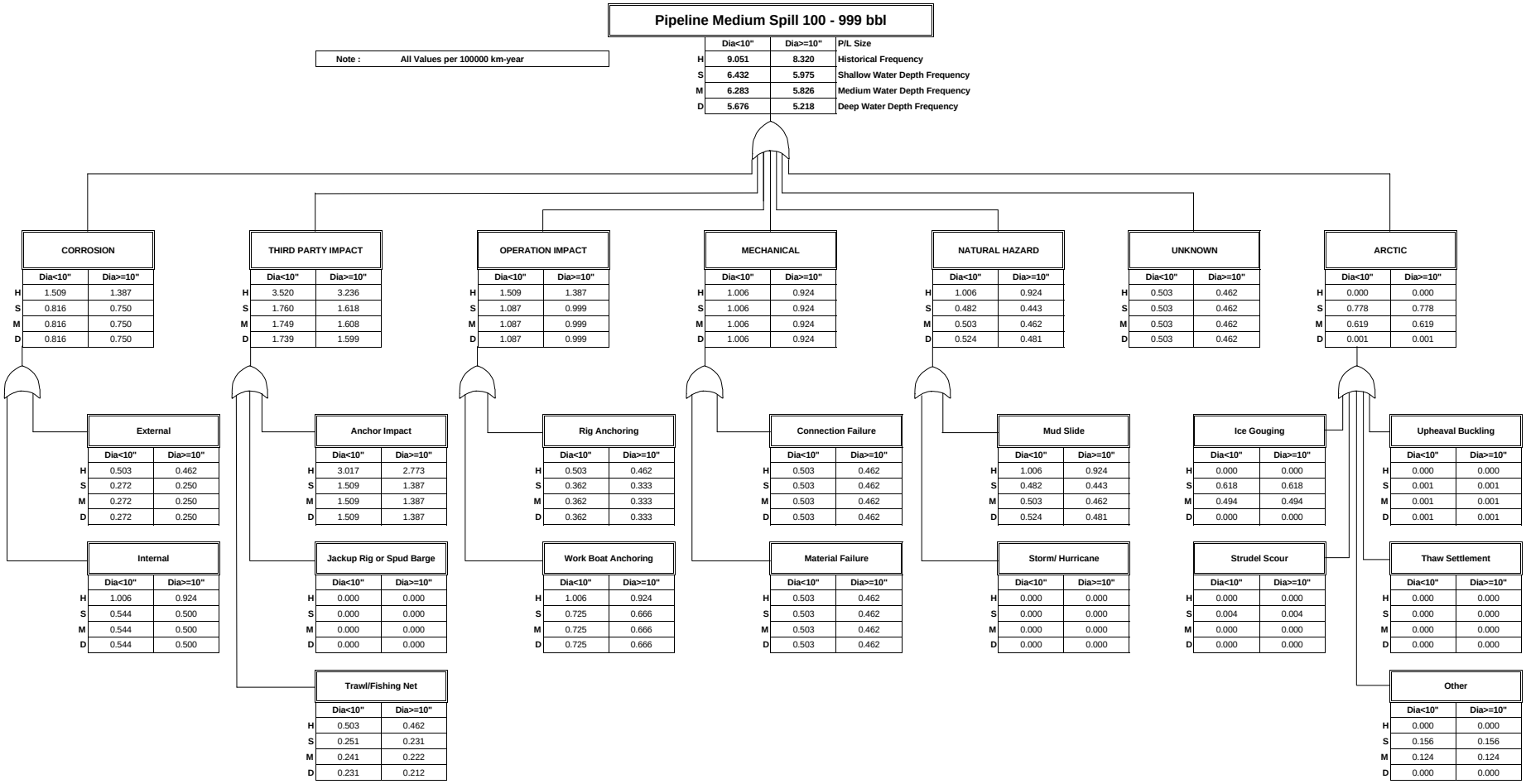


Figure 2.2 Fault Tree - Pipeline - Medium Spills

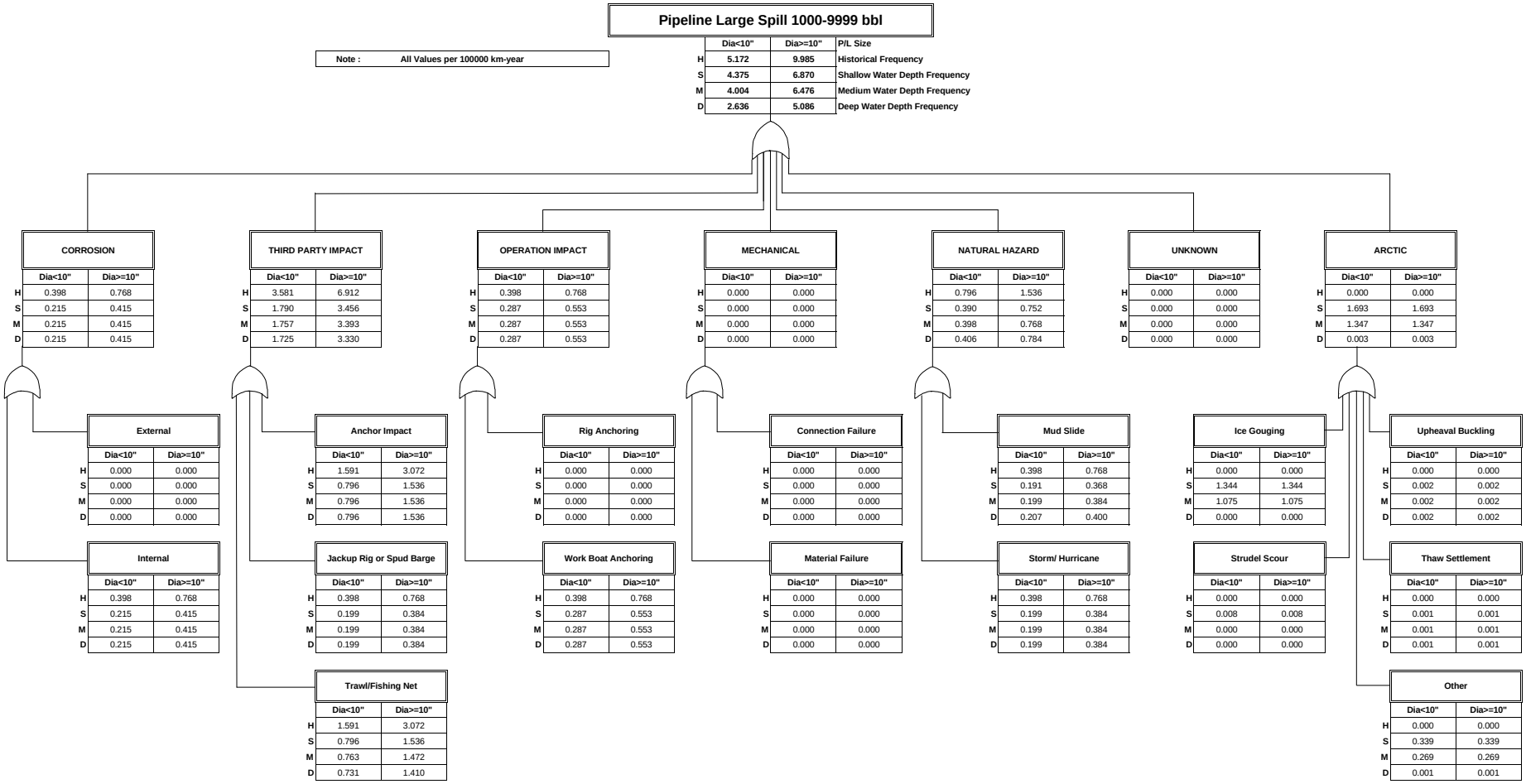


Figure 2.3 Fault Tree - Pipeline - Large Spills

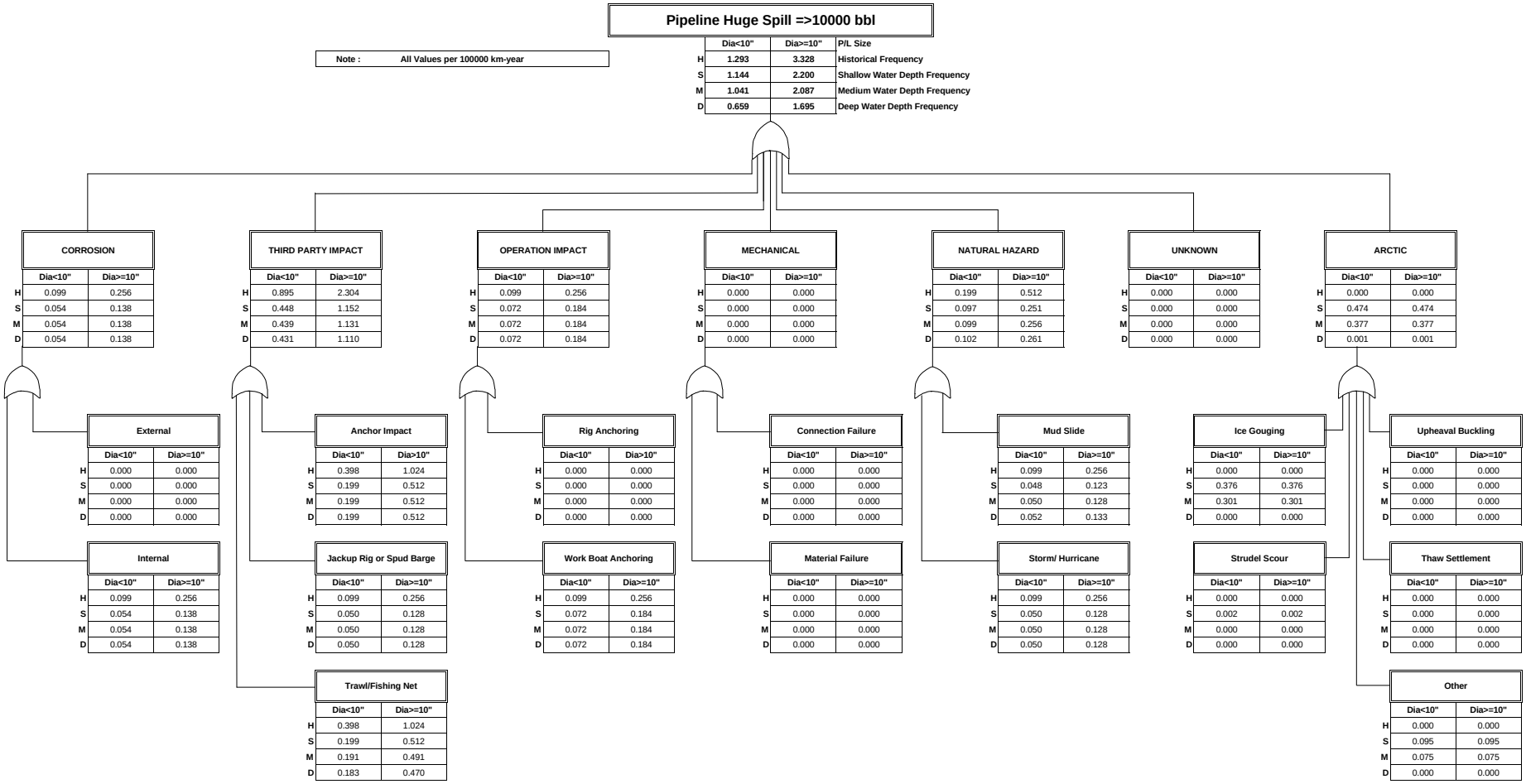


Figure 2.4 Fault Tree - Pipeline - Huge Spills

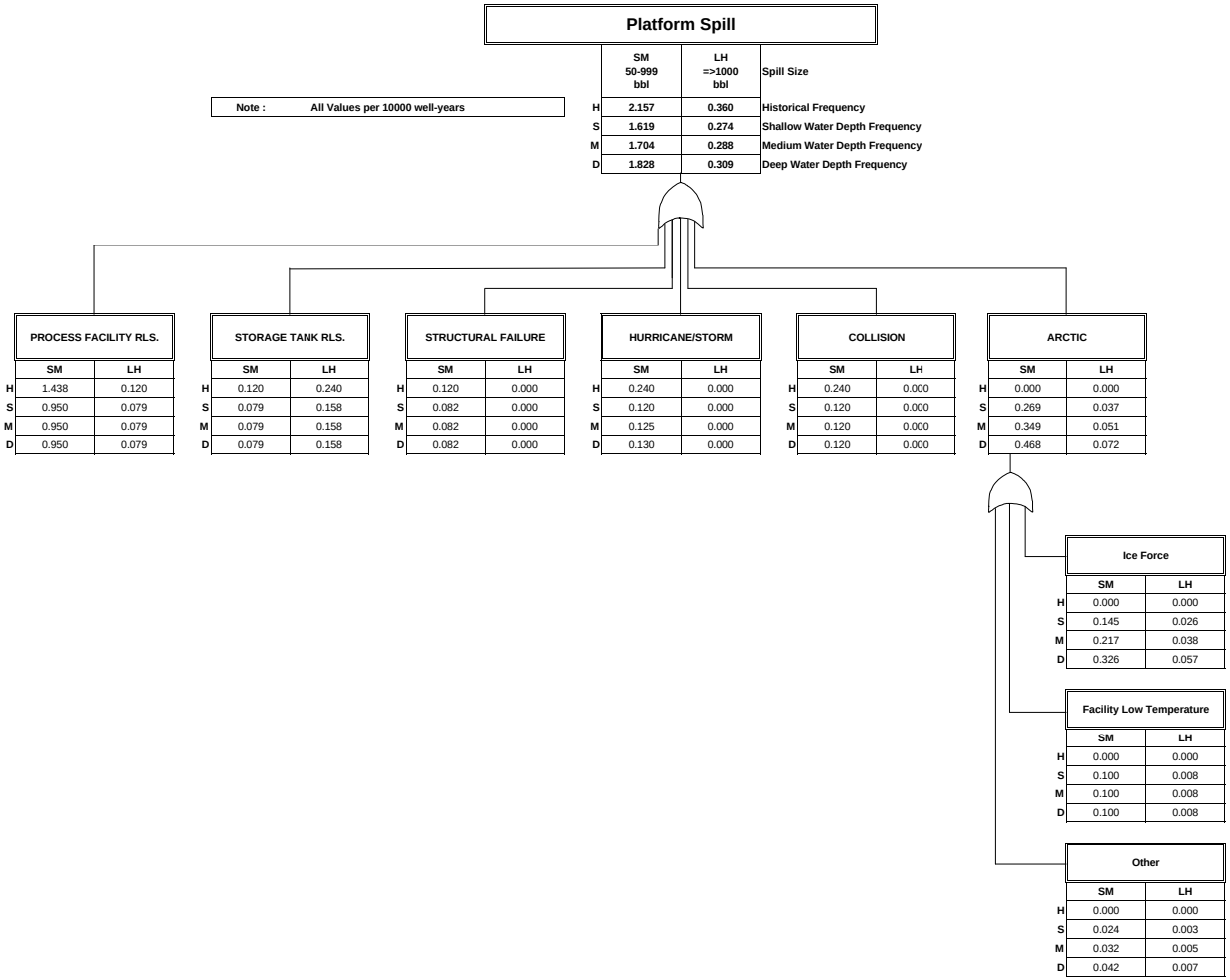


Figure 2.5 Fault Tree - Platform Spills

APPENDIX 3

Hazard Scenarios

Table 3.1
Beaufort Sea Sale 1 2004-2038

Year	Water Depth	Exploration Wells	Delineation Wells	Expl./Del. Rigs	Production Platforms		Production Wells		Service Wells		Production Rigs	In-use Pipeline Length [miles]						Production MMbbl
												Sum<10"		Sum >=10"		Sum All		
					Incr.	Cum.	Incr.	Cum.	Incr.	Cum.		Incr.	Cum.	Incr.	Cum.	Incr.	Cum.	
2004	Shallow	1		1														
	Medium																	
	Deep																	
	Total	**1**		**1**														
2005	Shallow	1		1														
	Medium																	
	Deep																	
	Total	**1**		**1**														
2006	Shallow	1	2	2														
	Medium																	
	Deep																	
	Total	**1**	**2**	**2**														
2007	Shallow	1		1														
	Medium																	
	Deep																	
	Total	**1**		**1**														
2008	Shallow		2	2														
	Medium	1																
	Deep																	
	Total	**1**	**2**	**2**														
2009	Shallow				1	1	3	3	3	3	1							
	Medium	1		1														
	Deep																	
	Total	**1**		**1**	**1**	**1**	**3**	**3**	**3**	**3**	**1**							
2010	Shallow					1	10	13	4	7	1			10	10	10	10	7.9
	Medium		2	1														
	Deep																	
	Total		**2**	**1**		**1**	**10**	**13**	**4**	**7**	**1**			**10**	**10**	10	10	**7.9**
2011	Shallow				1	2	13	26	7	14	2				10		10	15.7
	Medium																	
	Deep																	
	Total				**1**	**2**	**13**	**26**	**7**	**14**	**2**				**10**		10	**15.7**
2012	Shallow					2	10	36	4	18	1			10	20	10	20	23.6
	Medium																	
	Deep																	
	Total					**2**	**10**	**36**	**4**	**18**	**1**			**10**	**20**	10	20	**23.6**
2013	Shallow					2	10	46	4	22	1				20		20	31.5
	Medium																	
	Deep																	
	Total					**2**	**10**	**46**	**4**	**22**	**1**				**20**		20	**31.5**
2014	Shallow					2		46		22					20		20	28.7
	Medium				1	1	3	3	3	3	1							
	Deep																	
	Total				**1**	**3**	**3**	**49**	**3**	**25**	**1**				**20**		20	**28.7**
2015	Shallow					2		46		22				10	30	10	30	26.4
	Medium					1	10	13	4	7	1			10	10	10	10	13.2
	Deep																	
	Total					**3**	**10**	**59**	**4**	**29**	**1**			**20**	**40**	20	40	**39.6**
2016	Shallow					2		46		22					30		30	21.8
	Medium					1	10	23	4	11	1				10		10	22.0
	Deep																	
	Total					**3**	**10**	**69**	**4**	**33**	**1**				**40**		40	**43.8**
2017	Shallow					2		46		22					30		30	18.0
	Medium					1		23		11					10		10	22.0
	Deep																	
	Total					**3**		**69**		**33**					**40**		40	**40.0**
2018	Shallow					2		46		22					30		30	14.8
	Medium					1		23		11					10		10	22.0
	Deep																	
	Total					**3**		**69**		**33**					**40**		40	**36.8**
2019	Shallow					2		46		22					30		30	12.3
	Medium					1		23		11					10		10	22.0
	Deep																	
	Total					**3**		**69**		**33**					**40**		40	**34.3**
2020	Shallow					2		46		22					30		30	10.1
	Medium					1		23		11					10		10	18.9
	Deep																	
	Total					**3**		**69**		**33**					**40**		40	**29.0**
2021	Shallow					2		46		22					30		30	8.4
	Medium					1		23		11					10		10	16.3
	Deep																	
	Total					**3**		**69**		**33**					**40**		40	**24.7**
2022	Shallow					2		46		22					30		30	6.9
	Medium					1		23		11					10		10	14.0
	Deep																	
	Total					**3**		**69**		**33**					**40**		40	**20.9**

Table 3.1
Beaufort Sea Sale 1 2004-2038

Year	Water Depth	Exploration Wells	Delineation Wells	Expl./Del. Rigs	Production Platforms		Production Wells		Service Wells		Production Rigs	In-use Pipeline Length [miles]						Production MMbbl
												Sum<10"		Sum >=10"		Sum All		
					Incr.	Cum.	Incr.	Cum.	Incr.	Cum.		Incr.	Cum.	Incr.	Cum.	Incr.	Cum.	
2023	Shallow					2		46		22					30		30	5.7
	Medium					1		23		11					10		10	12.0
	Deep																	
	Total					**3**		**69**		**33**					**40**		40	**17.7**
2024	Shallow					2		46		22					30		30	4.7
	Medium					1		23		11					10		10	10.3
	Deep																	
	Total					**3**		**69**		**33**					**40**		40	**15.0**
2025	Shallow				-1	1	-23	23	-11	11				-10	20	-10	20	2.3
	Medium					1		23		11					10		10	8.9
	Deep																	
	Total				**-1**	**2**	**-23**	**46**	**-11**	**22**				**-10**	**30**	-10	30	**11.2**
2026	Shallow					1		23		11					20		20	1.9
	Medium					1		23		11					10		10	7.7
	Deep																	
	Total					**2**		**46**		**22**					**30**		30	**9.6**
2027	Shallow				-1		-23		-11					-10	10	-10	10	
	Medium					1		23		11					10		10	6.6
	Deep																	
	Total				**-1**	**1**	**-23**	**23**	**-11**	**11**				**-10**	**20**	-10	20	**6.6**
2028	Shallow														10		10	
	Medium					1		23		11					10		10	5.7
	Deep																	
	Total					**1**		**23**		**11**					**20**		20	**5.7**
2029	Shallow														10		10	
	Medium					1		23		11					10		10	4.9
	Deep																	
	Total					**1**		**23**		**11**					**20**		20	**4.9**
2030	Shallow													-10		-10		
	Medium					1		23		11					10		10	4.2
	Deep																	
	Total					**1**		**23**		**11**				**-10**	**10**	-10	10	**4.2**
2031	Shallow																	
	Medium					1		23		11					10		10	3.6
	Deep																	
	Total					**1**		**23**		**11**					**10**		10	**3.6**
2032	Shallow																	
	Medium					1		23		11					10		10	3.1
	Deep																	
	Total					**1**		**23**		**11**					**10**		10	**3.1**
2033	Shallow																	
	Medium					1		23		11					10		10	2.7
	Deep																	
	Total					**1**		**23**		**11**					**10**		10	**2.7**
2034	Shallow																	
	Medium				-1		-23		-11					-10		-10		
	Deep																	
	Total				**-1**		**-23**		**-11**					**-10**		-10		
2035	Shallow																	
	Medium																	
	Deep																	
	Total																	
2036	Shallow																	
	Medium																	
	Deep																	
	Total																	
2037	Shallow																	
	Medium																	
	Deep																	
	Total																	
2038	Shallow																	
	Medium																	
	Deep																	
	Total																	

Table 3.2
Beaufort Sea Sale 2 2004-2038

Year	Water Depth	Exploration Wells	Delineation Wells	Expl./Del. Rigs	Production Platforms		Production Wells		Service Wells		Production Rigs	In-use Pipeline Length [miles]						Production MMbbl
												Sum<10"		Sum >=10"		Sum All		
					Incr.	Cum.	Incr.	Cum.	Incr.	Cum.		Incr.	Cum.	Incr.	Cum.	Incr.	Cum.	
2004	Shallow																	
	Medium																	
	Deep																	
	Total																	
2005	Shallow																	
	Medium																	
	Deep																	
	Total																	
2006	Shallow																	
	Medium																	
	Deep																	
	Total																	
2007	Shallow	1		1														
	Medium																	
	Deep																	
	Total	**1**		**1**														
2008	Shallow	1		1														
	Medium																	
	Deep																	
	Total	**1**		**1**														
2009	Shallow		2	1														
	Medium																	
	Deep																	
	Total		**2**	**1**														
2010	Shallow																	
	Medium	1		1														
	Deep																	
	Total	**1**		**1**														
2011	Shallow																	
	Medium																	
	Deep																	
	Total																	
2012	Shallow				1	1	3	3	3	3	1							
	Medium	1		1														
	Deep	1		1														
	Total	**2**		**2**	**1**	**1**	**3**	**3**	**3**	**3**	**1**							
2013	Shallow					1	10	13	4	7	1			10	10	10	10	7.9
	Medium		2	1														
	Deep	1		1														
	Total	**1**	**2**	**2**		**1**	**10**	**13**	**4**	**7**	**1**			**10**	**10**	**10**	**10**	**7.9**
2014	Shallow					1	10	23	4	11	1				10		10	15.7
	Medium		2	1														
	Deep																	
	Total		**2**	**1**		**1**	**10**	**23**	**4**	**11**	**1**				**10**		**10**	**15.7**
2015	Shallow					1		23		11					10		10	15.7
	Medium																	
	Deep																	
	Total					**1**		**23**		**11**					**10**		**10**	**15.7**
2016	Shallow					1		23		11					10		10	15.7
	Medium				1	1	3	3	3	3	1							
	Deep																	
	Total				**1**	**2**	**3**	**26**	**3**	**14**	**1**				**10**		**10**	**15.7**
2017	Shallow					1		23		11				10	20	10	20	13.0
	Medium				1	2	13	16	7	10	2	5	5	15	15	20	20	21.5
	Deep																	
	Total				**1**	**3**	**13**	**39**	**7**	**21**	**2**	**5**	**5**	**25**	**35**	**30**	**40**	**34.5**
2018	Shallow					1		23		11					20		20	10.7
	Medium					2	20	36	8	18	2		5		15		20	28.6
	Deep																	
	Total					**3**	**20**	**59**	**8**	**29**	**2**		**5**		**35**		**40**	**39.3**
2019	Shallow					1		23		11					20		20	8.8
	Medium					2	10	46	4	22	1		5		15		20	28.6
	Deep																	
	Total					**3**	**10**	**69**	**4**	**33**	**1**		**5**		**35**		**40**	**37.4**
2020	Shallow					1		23		11					20		20	7.3
	Medium					2		46		22			5		15		20	28.6
	Deep																	
	Total					**3**		**69**		**33**			**5**		**35**		**40**	**35.9**
2021	Shallow					1		23		11					20		20	6.0
	Medium					2		46		22			5		15		20	28.6
	Deep																	
	Total					**3**		**69**		**33**			**5**		**35**		**40**	**34.6**
2022	Shallow					1		23		11					20		20	5.0
	Medium					2		46		22			5		15		20	28.6
	Deep																	
	Total					**3**		**69**		**33**			**5**		**35**		**40**	**33.6**

Table 3.2
Beaufort Sea Sale 2 2004-2038

Year	Water Depth	Exploration Wells	Delineation Wells	Expl./Del. Rigs	Production Platforms		Production Wells		Service Wells		Production Rigs	In-use Pipeline Length [miles]						Production MMbbl
												Sum<10"		Sum >=10"		Sum All		
					Incr.	Cum.	Incr.	Cum.	Incr.	Cum.		Incr.	Cum.	Incr.	Cum.	Incr.	Cum.	
2023	Shallow					1		23		11					20		20	4.1
	Medium					2		46		22			5		15		20	25.2
	Deep																	
	Total					**3**		**69**		**33**			**5**		**35**		**40**	**29.3**
2024	Shallow					1		23		11					20		20	3.4
	Medium					2		46		22			5		15		20	22.2
	Deep																	
	Total					**3**		**69**		**33**			**5**		**35**		**40**	**25.6**
2025	Shallow					1		23		11					20		20	2.8
	Medium					2		46		22			5		15		20	19.5
	Deep																	
	Total					**3**		**69**		**33**			**5**		**35**		**40**	**22.3**
2026	Shallow					1		23		11					20		20	2.3
	Medium					2		46		22			5		15		20	17.2
	Deep																	
	Total					**3**		**69**		**33**			**5**		**35**		**40**	**19.5**
2027	Shallow					1		23		11					20		20	1.9
	Medium					2		46		22			5		15		20	15.1
	Deep																	
	Total					**3**		**69**		**33**			**5**		**35**		**40**	**17.0**
2028	Shallow				-1		-23		-11					-15	5	-15	5	
	Medium					2		46		22			5		15		20	13.3
	Deep																	
	Total				**-1**	**2**	**-23**	**46**	**-11**	**22**			**5**	**-15**	**20**	**-15**	**25**	**13.3**
2029	Shallow														5		5	
	Medium					2		46		22			5		15		20	11.7
	Deep																	
	Total					**2**		**46**		**22**			**5**		**20**		**25**	**11.7**
2030	Shallow														5		5	
	Medium					2		46		22			5		15		20	10.3
	Deep																	
	Total					**2**		**46**		**22**			**5**		**20**		**25**	**10.3**
2031	Shallow														5		5	
	Medium					2		46		22			5		15		20	9.1
	Deep																	
	Total					**2**		**46**		**22**			**5**		**20**		**25**	**9.1**
2032	Shallow														5		5	
	Medium					2		46		22			5		15		20	8.0
	Deep																	
	Total					**2**		**46**		**22**			**5**		**20**		**25**	**8.0**
2033	Shallow														5		5	
	Medium					2		46		22			5		15		20	7.0
	Deep																	
	Total					**2**		**46**		**22**			**5**		**20**		**25**	**7.0**
2034	Shallow														5		5	
	Medium					2		46		22			5		15		20	6.2
	Deep																	
	Total					**2**		**46**		**22**			**5**		**20**		**25**	**6.2**
2035	Shallow														5		5	
	Medium					2		46		22			5		15		20	5.4
	Deep																	
	Total					**2**		**46**		**22**			**5**		**20**		**25**	**5.4**
2036	Shallow													-5		-5		
	Medium				-2		-46		-22			-5		-10	5	-15	5	4.8
	Deep																	
	Total				**-2**		**-46**		**-22**			**-5**		**-15**	**5**	**-20**	**5**	
2037	Shallow																	
	Medium														5		5	
	Deep																	
	Total														**5**		**5**	
2038	Shallow																	
	Medium														5		5	
	Deep																	
	Total														**5**		**5**	

Table 3.3
Beaufort Sea Sale 3 2004-2038

Year	Water Depth	Exploration Wells	Delineation Wells	Expl./Del. Rigs	Production Platforms		Production Wells		Service Wells		Production Rigs	In-use Pipeline Length [miles]						Production MMbbl
												Sum<10"		Sum >=10"		Sum All		
					Incr.	Cum.	Incr.	Cum.	Incr.	Cum.		Incr.	Cum.	Incr.	Cum.	Incr.	Cum.	
2004	Shallow																	
	Medium																	
	Deep																	
	Total																	
2005	Shallow																	
	Medium																	
	Deep																	
	Total																	
2006	Shallow																	
	Medium																	
	Deep																	
	Total																	
2007	Shallow																	
	Medium																	
	Deep																	
	Total																	
2008	Shallow																	
	Medium																	
	Deep																	
	Total																	
2009	Shallow																	
	Medium																	
	Deep																	
	Total																	
2010	Shallow	1		1														
	Medium																	
	Deep																	
	Total	**1**		**1**														
2011	Shallow																	
	Medium																	
	Deep																	
	Total																	
2012	Shallow																	
	Medium	1		1														
	Deep																	
	Total	**1**		**1**														
2013	Shallow																	
	Medium	1	1	1														
	Deep																	
	Total	**1**	**1**	**1**														
2014	Shallow																	
	Medium		2	1														
	Deep																	
	Total		**2**	**1**														
2015	Shallow																	
	Medium		2	1														
	Deep	1		1														
	Total	**1**	**2**	**2**														
2016	Shallow																	
	Medium																	
	Deep																	
	Total																	
2017	Shallow																	
	Medium																	
	Deep	1		1														
	Total	**1**		**1**														
2018	Shallow																	
	Medium				1	1	4	4	4	4	1							
	Deep	1		1														
	Total	**1**		**1**	**1**	**1**	**4**	**4**	**4**	**4**	**1**							
2019	Shallow													15	15	15	15	
	Medium				1	2	14	18	8	12	2	5	5	15	15	20	20	30.8
	Deep																	
	Total				**1**	**2**	**14**	**18**	**8**	**12**	**2**	**5**	**5**	**30**	**30**	**35**	**35**	**30.8**
2020	Shallow														15		15	
	Medium					2	20	38	8	20	2		5		15		20	38.6
	Deep																	
	Total					**2**	**20**	**38**	**8**	**20**	**2**		**5**		**30**		**35**	**38.6**
2021	Shallow														15		15	
	Medium					2	20	58	9	29	2		5		15		20	38.6
	Deep																	
	Total					**2**	**20**	**58**	**9**	**29**	**2**		**5**		**30**		**35**	**38.6**
2022	Shallow														15		15	
	Medium					2	10	68	5	34	1		5		15		20	38.6
	Deep																	
	Total					**2**	**10**	**68**	**5**	**34**	**1**		**5**		**30**		**35**	**38.6**

Table 3.3
Beaufort Sea Sale 3 2004-2038

2023	Shallow														15		15	
	Medium					2		68		34			5		15		20	38.6
	Deep																	
	Total					**2**		**68**		**34**			**5**		**30**		**35**	**38.6**
2024	Shallow														15		15	
	Medium					2		68		34			5		15		20	38.6
	Deep																	
	Total					**2**		**68**		**34**			**5**		**30**		**35**	**38.6**
2025	Shallow														15		15	
	Medium					2		68		34			5		15		20	34.0
	Deep																	
	Total					**2**		**68**		**34**			**5**		**30**		**35**	**34.0**
2026	Shallow														15		15	
	Medium					2		68		34			5		15		20	29.9
	Deep																	
	Total					**2**		**68**		**34**			**5**		**30**		**35**	**29.9**
2027	Shallow														15		15	
	Medium					2		68		34			5		15		20	26.3
	Deep																	
	Total					**2**		**68**		**34**			**5**		**30**		**35**	**26.3**
2028	Shallow														15		15	
	Medium					2		68		34			5		15		20	23.2
	Deep																	
	Total					**2**		**68**		**34**			**5**		**30**		**35**	**23.2**
2029	Shallow														15		15	
	Medium					2		68		34			5		15		20	20.4
	Deep																	
	Total					**2**		**68**		**34**			**5**		**30**		**35**	**20.4**
2030	Shallow														15		15	
	Medium					2		68		34			5		15		20	17.9
	Deep																	
	Total					**2**		**68**		**34**			**5**		**30**		**35**	**17.9**
2031	Shallow														15		15	
	Medium					2		68		34			5		15		20	15.8
	Deep																	
	Total					**2**		**68**		**34**			**5**		**30**		**35**	**15.8**
2032	Shallow														15		15	
	Medium					2		68		34			5		15		20	13.9
	Deep																	
	Total					**2**		**68**		**34**			**5**		**30**		**35**	**13.9**
2033	Shallow														15		15	
	Medium					2		68		34			5		15		20	12.2
	Deep																	
	Total					**2**		**68**		**34**			**5**		**30**		**35**	**12.2**
2034	Shallow														15		15	
	Medium					2		68		34			5		15		20	10.8
	Deep																	
	Total					**2**		**68**		**34**			**5**		**30**		**35**	**10.8**
2035	Shallow														15		15	
	Medium					2		68		34			5		15		20	9.5
	Deep																	
	Total					**2**		**68**		**34**			**5**		**30**		**35**	**9.5**
2036	Shallow														15		15	
	Medium					2		68		34			5		15		20	8.3
	Deep																	
	Total					**2**		**68**		**34**			**5**		**30**		**35**	**8.3**
2037	Shallow														15		15	
	Medium					2		68		34			5		15		20	7.3
	Deep																	
	Total					**2**		**68**		**34**			**5**		**30**		**35**	**7.3**
2038	Shallow														15		15	
	Medium					2		68		34			5		15		20	6.5
	Deep																	
	Total					**2**		**68**		**34**			**5**		**30**		**35**	**6.5**

Table 3.4
Beaufort Sea All Sales 2004-2038

Year	Water Depth	Exploration Wells	Delineation Wells	Expl./Del. Rigs	Production Platforms		Production Wells		Service Wells		Production Rigs	In-use Pipeline Length [miles]						Production MMbbl
												Sum<10"		Sum >=10"		Sum All		
					Incr.	Cum.	Incr.	Cum.	Incr.	Cum.		Incr.	Cum.	Incr.	Cum.	Incr.	Cum.	
2004	Shallow	1		1														
	Medium																	
	Deep																	
	Total	1		1														
2005	Shallow	1		1														
	Medium																	
	Deep																	
	Total	**1**		**1**														
2006	Shallow	1	2	2														
	Medium																	
	Deep																	
	Total	**1**	**2**	**2**														
2007	Shallow	2		2														
	Medium																	
	Deep																	
	Total	**2**		**2**														
2008	Shallow	1	2	3														
	Medium	1																
	Deep																	
	Total	**2**	**2**	**3**														
2009	Shallow		2	1	1	1	3	3	3	3	1							
	Medium	1		1														
	Deep																	
	Total	**1**	**2**	**2**	**1**	**1**	**3**	**3**	**3**	**3**	**1**							
2010	Shallow	1		1		1	10	13	4	7	1			10	10	10	10	7.9
	Medium	1	2	2														
	Deep																	
	Total	**2**	**2**	**3**		**1**	**10**	**13**	**4**	**7**	**1**			**10**	**10**	**10**	**10**	7.9
2011	Shallow				1	2	13	26	7	14	2				10		10	15.7
	Medium																	
	Deep																	
	Total				**1**	**2**	**13**	**26**	**7**	**14**	**2**				**10**		**10**	15.7
2012	Shallow				1	3	13	39	7	21	2			10	20	10	20	23.6
	Medium	2		2														
	Deep	1		1														
	Total	**3**		**3**	**1**	**3**	**13**	**39**	**7**	**21**	**2**			**10**	**20**	**10**	**20**	23.6
2013	Shallow					3	20	59	8	29	2			10	30	10	30	39.4
	Medium	1	3	2														
	Deep	1		1														
	Total	**2**	**3**	**3**		**3**	**20**	**59**	**8**	**29**	**2**			**10**	**30**	**10**	**30**	39.4
2014	Shallow					3	10	69	4	33	1				30		30	44.4
	Medium		4	2	1	1	3	3	3	3	1							
	Deep																	
	Total		**4**	**2**	**1**	**4**	**13**	**72**	**7**	**36**	**2**				**30**		**30**	44.4
2015	Shallow					3		69		33				10	40	10	40	42.1
	Medium		2	1		1	10	13	4	7	1			10	10	10	10	13.2
	Deep	1		1														
	Total	**1**	**2**	**2**		**4**	**10**	**82**	**4**	**40**	**1**			**20**	**50**	**20**	**50**	55.3
2016	Shallow					3		69		33					40		40	37.5
	Medium				1	2	13	26	7	14	2				10		10	22.0
	Deep																	
	Total				**1**	**5**	**13**	**95**	**7**	**47**	**2**				**50**		**50**	59.5
2017	Shallow					3		69		33				10	50	10	50	31.0
	Medium				1	3	13	39	7	21	2	5	5	15	25	20	30	43.5
	Deep	1		1														
	Total	**1**		**1**	**1**	**6**	**13**	**108**	**7**	**54**	**2**	**5**	**5**	**25**	**75**	**30**	**80**	74.5
2018	Shallow					3		69		33					50		50	25.5
	Medium				1	4	24	63	12	33	3		5		25		30	50.6
	Deep	1		1														
	Total	**1**		**1**	**1**	**7**	**24**	**132**	**12**	**66**	**3**		**5**		**75**		**80**	76.1
2019	Shallow					3		69		33				15	65	15	65	21.1
	Medium				1	5	24	87	12	45	3	5	10	15	40	20	50	81.4
	Deep																	
	Total				**1**	**8**	**24**	**156**	**12**	**78**	**3**	**5**	**10**	**30**	**105**	**35**	**115**	102.5
2020	Shallow					3		69		33					65		65	17.4
	Medium					5	20	107	8	53	2		10		40		50	86.1
	Deep																	
	Total					**8**	**20**	**176**	**8**	**86**	**2**		**10**		**105**		**115**	103.5
2021	Shallow					3		69		33					65		65	14.4
	Medium					5	20	127	9	62	2		10		40		50	83.5
	Deep																	
	Total					**8**	**20**	**196**	**9**	**95**	**2**		**10**		**105**		**115**	97.9
2022	Shallow					3		69		33					65		65	11.9
	Medium					5	10	137	5	67	1		10		40		50	81.2
	Deep																	
	Total					**8**	**10**	**206**	**5**	**100**	**1**		**10**		**105**		**115**	93.1

Table 3.4
Beaufort Sea All Sales 2004-2038

Year	Water Depth	Exploration Wells	Delineation Wells	Expl./Del. Rigs	Production Platforms		Production Wells		Service Wells		Production Rigs	In-use Pipeline Length [miles]						Production MMbbl
												Sum<10"		Sum >=10"		Sum All		
					Incr.	Cum.	Incr.	Cum.	Incr.	Cum.		Incr.	Cum.	Incr.	Cum.	Incr.	Cum.	
2023	Shallow					3		69		33					65		65	9.8
	Medium					5		137		67			10		40		50	75.8
	Deep																	
	Total					**8**		**206**		**100**			**10**		**105**		**115**	85.6
2024	Shallow					3		69		33					65		65	8.1
	Medium					5		137		67			10		40		50	71.1
	Deep																	
	Total					**8**		**206**		**100**			**10**		**105**		**115**	79.2
2025	Shallow				-1	2	-23	46	-11	22				-10	55	-10	55	5.1
	Medium					5		137		67			10		40		50	62.4
	Deep																	
	Total				**-1**	**7**	**-23**	**183**	**-11**	**89**			**10**	**-10**	**95**	**-10**	**105**	67.5
2026	Shallow					2		46		22					55		55	4.2
	Medium					5		137		67			10		40		50	54.8
	Deep																	
	Total					**7**		**183**		**89**			**10**		**95**		**105**	59.0
2027	Shallow				-1	1	-23	23	-11	11				-10	45	-10	45	1.9
	Medium					5		137		67			10		40		50	48.0
	Deep																	
	Total				**-1**	**6**	**-23**	**160**	**-11**	**78**			**10**	**-10**	**85**	**-10**	**95**	49.9
2028	Shallow				-1		-23		-11					-15	30	-15	30	
	Medium					5		137		67			10		40		50	42.2
	Deep																	
	Total				**-1**	**5**	**-23**	**137**	**-11**	**67**			**10**	**-15**	**70**	**-15**	**80**	42.2
2029	Shallow														30		30	
	Medium					5		137		67			10		40		50	37.0
	Deep																	
	Total					**5**		**137**		**67**			**10**		**70**		**80**	37.0
2030	Shallow													-10	20	-10	20	
	Medium					5		137		67			10		40		50	32.4
	Deep																	
	Total					**5**		**137**		**67**			**10**	**-10**	**60**	**-10**	**70**	32.4
2031	Shallow														20		20	
	Medium					5		137		67			10		40		50	28.5
	Deep																	
	Total					**5**		**137**		**67**			**10**		**60**		**70**	28.5
2032	Shallow														20		20	
	Medium					5		137		67			10		40		50	25.0
	Deep																	
	Total					**5**		**137**		**67**			**10**		**60**		**70**	25.0
2033	Shallow														20		20	
	Medium					5		137		67			10		40		50	21.9
	Deep																	
	Total					**5**		**137**		**67**			**10**		**60**		**70**	21.9
2034	Shallow														20		20	
	Medium				-1	4	-23	114	-11	56			10	-10	30	-10	40	17.0
	Deep																	
	Total				**-1**	**4**	**-23**	**114**	**-11**	**56**			**10**	**-10**	**50**	**-10**	**60**	17.0
2035	Shallow														20		20	
	Medium					4		114		56			10		30		40	14.9
	Deep																	
	Total					**4**		**114**		**56**			**10**		**50**		**60**	14.9
2036	Shallow													-5	15	-5	15	
	Medium				-2	2	-46	68	-22	34		-5	5	-10	20	-15	25	13.1
	Deep																	
	Total				**-2**	**2**	**-46**	**68**	**-22**	**34**		**-5**	**5**	**-15**	**35**	**-20**	**40**	8.3
2037	Shallow														15		15	
	Medium					2		68		34			5		20		25	7.3
	Deep																	
	Total					**2**		**68**		**34**			**5**		**35**		**40**	7.3
2038	Shallow														15		15	
	Medium					2		68		34			5		20		25	6.5
	Deep																	
	Total					**2**		**68**		**34**			**5**		**35**		**40**	6.5

APPENDIX 4
Spill Occurrence

4.1
Arctic Spill Occurrence
Beaufort Sea Sale 1

Table 4.1.1
Arctic Spill Occurrence Beaufort Sea Sale 1 P/L Spills

Year	Water Depth	P/L Dia <10"													P/L Dia >= 10"												
		P/L [miles]	Small Spills 50-99 bbl			Medium Spills 100-999 bbl			Large Spills 1000-9999 bbl			Huge Spills =>10000 bbl			P/L [miles]	Small Spills 50-99 bbl			Medium Spills 100-999 bbl			Large Spills 1000-9999 bbl			Huge Spills =>10000 bbl		
			Expected Spill [bbl] =		71	Expected Spill [bbl] =		485	Expected Spill [bbl] =		5279	Expected Spill [bbl] =		14880		Expected Spill [bbl] =		71	Expected Spill [bbl] =		516	Expected Spill [bbl] =		5176	Expected Spill [bbl] =		15552
		Cumm.	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl	Cumm.	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl
2004	Shallow		3.671			6.432			4.375			1.144				2.519			5.975			6.870			2.200		
	Medium		3.587			6.283			4.004			1.041				2.433			5.826			6.476			2.087		
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total																										
2005	Shallow		3.671			6.432			4.375			1.144				2.519			5.975			6.870			2.200		
	Medium		3.587			6.283			4.004			1.041				2.433			5.826			6.476			2.087		
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total																										
2006	Shallow		3.671			6.432			4.375			1.144				2.519			5.975			6.870			2.200		
	Medium		3.587			6.283			4.004			1.041				2.433			5.826			6.476			2.087		
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total																										
2007	Shallow		3.671			6.432			4.375			1.144				2.519			5.975			6.870			2.200		
	Medium		3.587			6.283			4.004			1.041				2.433			5.826			6.476			2.087		
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total																										
2008	Shallow		3.671			6.432			4.375			1.144				2.519			5.975			6.870			2.200		
	Medium		3.587			6.283			4.004			1.041				2.433			5.826			6.476			2.087		
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total																										
2009	Shallow		3.671			6.432			4.375			1.144				2.519			5.975			6.870			2.200		
	Medium		3.587			6.283			4.004			1.041				2.433			5.826			6.476			2.087		
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total																										
2010	Shallow		3.671			6.432			4.375			1.144			10	2.519	0.405	0.03	5.975	0.961	0.50	6.870	1.105	5.72	2.200	0.354	5.50
	Medium		3.587			6.283			4.004			1.041				2.433			5.826			6.476			2.087		
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total														**10**		**0.405**	**0.03**		**0.961**	**0.50**		**1.105**	**5.72**		**0.354**	**5.50**
2011	Shallow		3.671			6.432			4.375			1.144			10	2.519	0.405	0.03	5.975	0.961	0.50	6.870	1.105	5.72	2.200	0.354	5.50
	Medium		3.587			6.283			4.004			1.041				2.433			5.826			6.476			2.087		
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total														**10**		**0.405**	**0.03**		**0.961**	**0.50**		**1.105**	**5.72**		**0.354**	**5.50**
2012	Shallow		3.671			6.432			4.375			1.144			20	2.519	0.811	0.06	5.975	1.923	0.99	6.870	2.211	11.44	2.200	0.708	11.01
	Medium		3.587			6.283			4.004			1.041				2.433			5.826			6.476			2.087		
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total														**20**		**0.811**	**0.06**		**1.923**	**0.99**		**2.211**	**11.44**		**0.708**	**11.01**
2013	Shallow		3.671			6.432			4.375			1.144			20	2.519	0.811	0.06	5.975	1.923	0.99	6.870	2.211	11.44	2.200	0.708	11.01
	Medium		3.587			6.283			4.004			1.041				2.433			5.826			6.476			2.087		
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total														**20**		**0.811**	**0.06**		**1.923**	**0.99**		**2.211**	**11.44**		**0.708**	**11.01**
2014	Shallow		3.671			6.432			4.375			1.144			20	2.519	0.811	0.06	5.975	1.923	0.99	6.870	2.211	11.44	2.200	0.708	11.01
	Medium		3.587			6.283			4.004			1.041				2.433			5.826			6.476			2.087		
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total														**20**		**0.811**	**0.06**		**1.923**	**0.99**		**2.211**	**11.44**		**0.708**	**11.01**
2015	Shallow		3.671			6.432			4.375			1.144			30	2.519	1.216	0.09	5.975	2.884	1.49	6.870	3.316	17.16	2.200	1.062	16.51
	Medium		3.587			6.283			4.004			1.041			10	2.433	0.391	0.03	5.826	0.937	0.48	6.476	1.042	5.39	2.087	0.336	5.22
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total														**40**		**1.607**	**0.11**		**3.822**	**1.97**		**4.358**	**22.56**		**1.398**	**21.74**
2016	Shallow		3.671			6.432			4.375			1.144			30	2.519	1.216	0.09	5.975	2.884	1.49	6.870	3.316	17.16	2.200	1.062	16.51
	Medium		3.587			6.283			4.004			1.041			10	2.433	0.391	0.03	5.826	0.937	0.48	6.476	1.042	5.39	2.087	0.336	5.22
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total														**40**		**1.607**	**0.11**		**3.822**	**1.97**		**4.358**	**22.56**		**1.398**	**21.74**
2017	Shallow		3.671			6.432			4.375			1.144			30	2.519	1.216	0.09	5.975	2.884	1.49	6.870	3.316	17.16	2.200	1.062	16.51
	Medium		3.587			6.283			4.004			1.041			10	2.433	0.391	0.03	5.826	0.937	0.48	6.476	1.042	5.39	2.087	0.336	5.22
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total														**40**		**1.607**	**0.11**		**3.822**	**1.97**		**4.358**	**22.56**		**1.398**	**21.74**
2018	Shallow		3.671			6.432			4.375			1.144			30	2.519	1.216	0.09	5.975	2.884	1.49	6.870	3.316	17.16	2.200	1.062	16.51
	Medium		3.587			6.283			4.004			1.041			10	2.433	0.391	0.03	5.826	0.937	0.48	6.476	1.042	5.39	2.087	0.336	5.22
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total														**40**		**1.607**	**0.11**		**3.822**	**1.97**		**4.358**	**22.56**		**1.398**	**21.74**
2019	Shallow		3.671			6.432			4.375			1.144			30	2.519	1.216	0.09	5.975	2.884	1.49	6.870	3.316	17.16	2.200	1.062	16.51
	Medium		3.587			6.283			4.004			1.041			10	2.433	0.391	0.03	5.826	0.937	0.48	6.476	1.042	5.39	2.087	0.336	5.22
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total														**40**		**1.607**	**0.11**		**3.822**	**1.97**		**4.358**	**22.56**		**1.398**	**21.74**
2020	Shallow		3.671			6.432			4.375			1.144			30	2.519	1.216	0.09	5.975	2.884	1.49	6.870	3.316	17.16	2.200	1.062	16.51
	Medium		3.587			6.283			4.004			1.041			10	2.433	0.391	0.03	5.826	0.937	0.48	6.476	1.042	5.39	2.087	0.336	5.22
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total														**40**		**1.607**	**0.11**		**3.822**	**1.97**		**4.358**	**22.56**		**1.398**	**21.74**
2021	Shallow		3.671			6.432			4.375			1.144			30	2.519	1.216	0.09	5.975	2.884	1.49	6.870	3.316	17.16	2.200	1.062	16.51
	Medium		3.587			6.283			4.004			1.041			10	2.433	0.391	0.03	5.826	0.937	0.48	6.476	1.042	5.39	2.087	0.336	5.22
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total														**40**		**1.607**	**0.11**		**3.822**	**1.97**		**4.358**	**22.56**		**1.398**	**21.74**
2022	Shallow		3.671			6.432			4.375			1.144			30	2.519	1.216	0.09	5.975	2.884	1.49	6.870	3.316	17.16	2.200	1.062	16.51
	Medium		3.587			6.283			4.004			1.041			10	2.433	0.391	0.03	5.826	0.937	0.48	6.476	1.042	5.39	2.087	0.336	5.22
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total														**40**		**1.607**	**0.11**		**3.822**	**1.97**		**4.358**	**22.56**		**1.398**	**21.74**
2023	Shallow		3.671			6.432			4.375			1.144			30	2.519	1.216	0.09	5.975	2.884	1.49	6.870	3.316	17.16	2.200	1.062	16.51
	Medium		3.587			6.283			4.004			1.041			10	2.433	0.391	0.03	5.826	0.937	0.48	6.476	1.042	5.39	2.087	0.336	5.22
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		

Table 4.1.1
Arctic Spill Occurrence Beaufort Sea Sale 1 P/L Spills

Year	Water Depth	P/L Dia <10"													P/L Dia >= 10"												
		P/L [miles]	Small Spills 50-99 bbl			Medium Spills 100-999 bbl			Large Spills 1000-9999 bbl			Huge Spills =>10000 bbl			P/L [miles]	Small Spills 50-99 bbl			Medium Spills 100-999 bbl			Large Spills 1000-9999 bbl			Huge Spills =>10000 bbl		
			Expected Spill [bbl] =		71	Expected Spill [bbl] =		485	Expected Spill [bbl] =		5279	Expected Spill [bbl] =		14880		Expected Spill [bbl] =		71	Expected Spill [bbl] =		516	Expected Spill [bbl] =		5176	Expected Spill [bbl] =		15552
		Cumm.	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl	Cumm.	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl
	Total														**40**		**1.607**	**0.11**		**3.822**	**1.97**		**4.358**	**22.56**		**1.398**	**21.74**
2024	Shallow		3.671			6.432			4.375			1.144			30	2.519	1.216	0.09	5.975	2.884	1.49	6.870	3.316	17.16	2.200	1.062	16.51
	Medium		3.587			6.283			4.004			1.041			10	2.433	0.391	0.03	5.826	0.937	0.48	6.476	1.042	5.39	2.087	0.336	5.22
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total														**40**		**1.607**	**0.11**		**3.822**	**1.97**		**4.358**	**22.56**		**1.398**	**21.74**
2025	Shallow		3.671			6.432			4.375			1.144			20	2.519	0.811	0.06	5.975	1.923	0.99	6.870	2.211	11.44	2.200	0.708	11.01
	Medium		3.587			6.283			4.004			1.041			10	2.433	0.391	0.03	5.826	0.937	0.48	6.476	1.042	5.39	2.087	0.336	5.22
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total														**30**		**1.202**	**0.09**		**2.860**	**1.48**		**3.253**	**16.84**		**1.044**	**16.23**
2026	Shallow		3.671			6.432			4.375			1.144			20	2.519	0.811	0.06	5.975	1.923	0.99	6.870	2.211	11.44	2.200	0.708	11.01
	Medium		3.587			6.283			4.004			1.041			10	2.433	0.391	0.03	5.826	0.937	0.48	6.476	1.042	5.39	2.087	0.336	5.22
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total														**30**		**1.202**	**0.09**		**2.860**	**1.48**		**3.253**	**16.84**		**1.044**	**16.23**
2027	Shallow		3.671			6.432			4.375			1.144			10	2.519	0.405	0.03	5.975	0.961	0.50	6.870	1.105	5.72	2.200	0.354	5.50
	Medium		3.587			6.283			4.004			1.041			10	2.433	0.391	0.03	5.826	0.937	0.48	6.476	1.042	5.39	2.087	0.336	5.22
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total														**20**		**0.797**	**0.06**		**1.899**	**0.98**		**2.147**	**11.11**		**0.690**	**10.73**
2028	Shallow		3.671			6.432			4.375			1.144			10	2.519	0.405	0.03	5.975	0.961	0.50	6.870	1.105	5.72	2.200	0.354	5.50
	Medium		3.587			6.283			4.004			1.041			10	2.433	0.391	0.03	5.826	0.937	0.48	6.476	1.042	5.39	2.087	0.336	5.22
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total														**20**		**0.797**	**0.06**		**1.899**	**0.98**		**2.147**	**11.11**		**0.690**	**10.73**
2029	Shallow		3.671			6.432			4.375			1.144			10	2.519	0.405	0.03	5.975	0.961	0.50	6.870	1.105	5.72	2.200	0.354	5.50
	Medium		3.587			6.283			4.004			1.041			10	2.433	0.391	0.03	5.826	0.937	0.48	6.476	1.042	5.39	2.087	0.336	5.22
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total														**20**		**0.797**	**0.06**		**1.899**	**0.98**		**2.147**	**11.11**		**0.690**	**10.73**
2030	Shallow		3.671			6.432			4.375			1.144				2.519			5.975			6.870			2.200		
	Medium		3.587			6.283			4.004			1.041			10	2.433	0.391	0.03	5.826	0.937	0.48	6.476	1.042	5.39	2.087	0.336	5.22
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total														**10**		**0.391**	**0.03**		**0.937**	**0.48**		**1.042**	**5.39**		**0.336**	**5.22**
2031	Shallow		3.671			6.432			4.375			1.144				2.519			5.975			6.870			2.200		
	Medium		3.587			6.283			4.004			1.041			10	2.433	0.391	0.03	5.826	0.937	0.48	6.476	1.042	5.39	2.087	0.336	5.22
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total														**10**		**0.391**	**0.03**		**0.937**	**0.48**		**1.042**	**5.39**		**0.336**	**5.22**
2032	Shallow		3.671			6.432			4.375			1.144				2.519			5.975			6.870			2.200		
	Medium		3.587			6.283			4.004			1.041			10	2.433	0.391	0.03	5.826	0.937	0.48	6.476	1.042	5.39	2.087	0.336	5.22
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total														**10**		**0.391**	**0.03**		**0.937**	**0.48**		**1.042**	**5.39**		**0.336**	**5.22**
2033	Shallow		3.671			6.432			4.375			1.144				2.519			5.975			6.870			2.200		
	Medium		3.587			6.283			4.004			1.041			10	2.433	0.391	0.03	5.826	0.937	0.48	6.476	1.042	5.39	2.087	0.336	5.22
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total														**10**		**0.391**	**0.03**		**0.937**	**0.48**		**1.042**	**5.39**		**0.336**	**5.22**
2034	Shallow		3.671			6.432			4.375			1.144				2.519			5.975			6.870			2.200		
	Medium		3.587			6.283			4.004			1.041				2.433			5.826			6.476			2.087		
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total																										
2035	Shallow		3.671			6.432			4.375			1.144				2.519			5.975			6.870			2.200		
	Medium		3.587			6.283			4.004			1.041				2.433			5.826			6.476			2.087		
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total																										
2036	Shallow		3.671			6.432			4.375			1.144				2.519			5.975			6.870			2.200		
	Medium		3.587			6.283			4.004			1.041				2.433			5.826			6.476			2.087		
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total																										
2037	Shallow		3.671			6.432			4.375			1.144				2.519			5.975			6.870			2.200		
	Medium		3.587			6.283			4.004			1.041				2.433			5.826			6.476			2.087		
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total																										
2038	Shallow		3.671			6.432			4.375			1.144				2.519			5.975			6.870			2.200		
	Medium		3.587			6.283			4.004			1.041				2.433			5.826			6.476			2.087		
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total																										

Table 4.1.2
Arctic Spill Occurrence - Sale 1 - P/L - Summary

Year	Production [MMbbl]	Small Spills 50-99 bbl			Medium Spills 100-999 bbl			Small and Medium Spills 50-999 bbl			Large Spills 1000-9999 bbl			Huge Spills =>10000 bbl			Significant Spills =>1000 bbl			All Spills		
		Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 103years	Frequency Spills per 109 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]
2004																						
2005																						
2006																						
2007																						
2008																						
2009																						
2010	**7.9**	0.405	0.051	0.029	0.961	0.122	0.496	1.367	0.173	0.525	1.105	0.140	5.721	0.354	0.045	5.504	1.459	0.185	11.226	2.826	0.358	11.751
2011	**15.7**	0.405	0.026	0.029	0.961	0.061	0.496	1.367	0.087	0.525	1.105	0.070	5.721	0.354	0.023	5.504	1.459	0.093	11.226	2.826	0.180	11.751
2012	**23.6**	0.811	0.034	0.058	1.923	0.081	0.992	2.734	0.116	1.050	2.211	0.094	11.443	0.708	0.030	11.009	2.919	0.124	22.451	5.652	0.240	23.501
2013	**31.5**	0.811	0.026	0.058	1.923	0.061	0.992	2.734	0.087	1.050	2.211	0.070	11.443	0.708	0.022	11.009	2.919	0.093	22.451	5.652	0.179	23.501
2014	**28.7**	0.811	0.028	0.058	1.923	0.067	0.992	2.734	0.095	1.050	2.211	0.077	11.443	0.708	0.025	11.009	2.919	0.102	22.451	5.652	0.197	23.501
2015	**39.6**	1.607	0.041	0.114	3.822	0.097	1.972	5.429	0.137	2.086	4.358	0.110	22.557	1.398	0.035	21.735	5.756	0.145	44.292	11.185	0.282	46.379
2016	**43.8**	1.607	0.037	0.114	3.822	0.087	1.972	5.429	0.124	2.086	4.358	0.100	22.557	1.398	0.032	21.735	5.756	0.131	44.292	11.185	0.255	46.379
2017	**40.0**	1.607	0.040	0.114	3.822	0.096	1.972	5.429	0.136	2.086	4.358	0.109	22.557	1.398	0.035	21.735	5.756	0.144	44.292	11.185	0.280	46.379
2018	**36.8**	1.607	0.044	0.114	3.822	0.104	1.972	5.429	0.148	2.086	4.358	0.118	22.557	1.398	0.038	21.735	5.756	0.156	44.292	11.185	0.304	46.379
2019	**34.3**	1.607	0.047	0.114	3.822	0.111	1.972	5.429	0.158	2.086	4.358	0.127	22.557	1.398	0.041	21.735	5.756	0.168	44.292	11.185	0.326	46.379
2020	**29.0**	1.607	0.055	0.114	3.822	0.132	1.972	5.429	0.187	2.086	4.358	0.150	22.557	1.398	0.048	21.735	5.756	0.198	44.292	11.185	0.386	46.379
2021	**24.7**	1.607	0.065	0.114	3.822	0.155	1.972	5.429	0.220	2.086	4.358	0.176	22.557	1.398	0.057	21.735	5.756	0.233	44.292	11.185	0.453	46.379
2022	**20.9**	1.607	0.077	0.114	3.822	0.183	1.972	5.429	0.260	2.086	4.358	0.209	22.557	1.398	0.067	21.735	5.756	0.275	44.292	11.185	0.535	46.379
2023	**17.7**	1.607	0.091	0.114	3.822	0.216	1.972	5.429	0.307	2.086	4.358	0.246	22.557	1.398	0.079	21.735	5.756	0.325	44.292	11.185	0.632	46.379
2024	**15.0**	1.607	0.107	0.114	3.822	0.255	1.972	5.429	0.362	2.086	4.358	0.291	22.557	1.398	0.093	21.735	5.756	0.384	44.292	11.185	0.746	46.379
2025	**11.2**	1.202	0.107	0.086	2.860	0.255	1.476	4.062	0.363	1.561	3.253	0.290	16.836	1.044	0.093	16.231	4.297	0.384	33.067	8.359	0.746	34.628
2026	**9.6**	1.202	0.125	0.086	2.860	0.298	1.476	4.062	0.423	1.561	3.253	0.339	16.836	1.044	0.109	16.231	4.297	0.448	33.067	8.359	0.871	34.628
2027	**6.6**	0.797	0.121	0.057	1.899	0.288	0.980	2.696	0.408	1.036	2.147	0.325	11.115	0.690	0.105	10.726	2.837	0.430	21.841	5.533	0.838	22.877
2028	**5.7**	0.797	0.140	0.057	1.899	0.333	0.980	2.696	0.473	1.036	2.147	0.377	11.115	0.690	0.121	10.726	2.837	0.498	21.841	5.533	0.971	22.877
2029	**4.9**	0.797	0.163	0.057	1.899	0.388	0.980	2.696	0.550	1.036	2.147	0.438	11.115	0.690	0.141	10.726	2.837	0.579	21.841	5.533	1.129	22.877
2030	**4.2**	0.391	0.093	0.028	0.937	0.223	0.484	1.329	0.316	0.512	1.042	0.248	5.393	0.336	0.080	5.222	1.378	0.328	10.615	2.707	0.644	11.127
2031	**3.6**	0.391	0.109	0.028	0.937	0.260	0.484	1.329	0.369	0.512	1.042	0.289	5.393	0.336	0.093	5.222	1.378	0.383	10.615	2.707	0.752	11.127
2032	**3.1**	0.391	0.126	0.028	0.937	0.302	0.484	1.329	0.429	0.512	1.042	0.336	5.393	0.336	0.108	5.222	1.378	0.444	10.615	2.707	0.873	11.127
2033	**2.7**	0.391	0.145	0.028	0.937	0.347	0.484	1.329	0.492	0.512	1.042	0.386	5.393	0.336	0.124	5.222	1.378	0.510	10.615	2.707	1.002	11.127
2034																						
2035																						
2036																						
2037																						
2038																						
Total LOF	**460.8**	**25.677**		**2**	**61.075**		**32**	**86.752**		**33**	**69.543**		**360**	**22.307**		**347**	**91.850**		**707**	**178.602**		**740**
Average LOF		**0.856**	**0.056**	**0**	**2.036**	**0.133**	**1**	**2.892**	**0.188**	**1**	**2.318**	**0.151**	**12**	**0.744**	**0.048**	**12**	**3.062**	**0.199**	**24**	**5.953**	**0.388**	**25**

Table 4.1.3
Arctic Spill Occurrence - Sale 1 - Platforms

Year	Water Depth	N Platforms	N P Wells	Small and Medium Spills 50-999 bbl			Large and Huge Spills =>1000 bbl		
				Expected Spill [bbl] =		**452**	Expected Spill [bbl] =		**5631**
		Cum.	Cum.	Frequency spills per 10^4well-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4well-year	Frequency spills per 10^3years	Spill Index bbl
2004	Shallow			1.619			0.274		
	Medium			1.704			0.288		
	Deep			1.828			0.309		
	Total								
2005	Shallow			1.619			0.274		
	Medium			1.704			0.288		
	Deep			1.828			0.309		
	Total								
2006	Shallow			1.619			0.274		
	Medium			1.704			0.288		
	Deep			1.828			0.309		
	Total								
2007	Shallow			1.619			0.274		
	Medium			1.704			0.288		
	Deep			1.828			0.309		
	Total								
2008	Shallow			1.619			0.274		
	Medium			1.704			0.288		
	Deep			1.828			0.309		
	Total								
2009	Shallow	1	3	1.619	0.486	0.22	0.274	0.082	0.46
	Medium			1.704			0.288		
	Deep			1.828			0.309		
	Total	**1**	**3**		**0.486**	**0.22**		**0.082**	**0.46**
2010	Shallow	1	13	1.619	2.105	0.95	0.274	0.357	2.01
	Medium			1.704			0.288		
	Deep			1.828			0.309		
	Total	**1**	**13**		**2.105**	**0.95**		**0.357**	**2.01**
2011	Shallow	2	26	1.619	4.210	1.90	0.274	0.713	4.02
	Medium			1.704			0.288		
	Deep			1.828			0.309		
	Total	**2**	**26**		**4.210**	**1.90**		**0.713**	**4.02**
2012	Shallow	2	36	1.619	5.829	2.63	0.274	0.987	5.56
	Medium			1.704			0.288		
	Deep			1.828			0.309		
	Total	**2**	**36**		**5.829**	**2.63**		**0.987**	**5.56**
2013	Shallow	2	46	1.619	7.448	3.37	0.274	1.262	7.11
	Medium			1.704			0.288		
	Deep			1.828			0.309		
	Total	**2**	**46**		**7.448**	**3.37**		**1.262**	**7.11**
2014	Shallow	2	46	1.619	7.448	3.37	0.274	1.262	7.11
	Medium	1	3	1.704	0.511	0.23	0.288	0.087	0.49
	Deep			1.828			0.309		
	Total	**3**	**49**		**7.959**	**3.60**		**1.348**	**7.59**
2015	Shallow	2	46	1.619	7.448	3.37	0.274	1.262	7.11
	Medium	1	13	1.704	2.215	1.00	0.288	0.375	2.11
	Deep			1.828			0.309		
	Total	**3**	**59**		**9.663**	**4.37**		**1.637**	**9.22**
2016	Shallow	2	46	1.619	7.448	3.37	0.274	1.262	7.11
	Medium	1	23	1.704	3.918	1.77	0.288	0.663	3.73
	Deep			1.828			0.309		
	Total	**3**	**69**		**11.366**	**5.14**		**1.925**	**10.84**
2017	Shallow	2	46	1.619	7.448	3.37	0.274	1.262	7.11
	Medium	1	23	1.704	3.918	1.77	0.288	0.663	3.73
	Deep			1.828			0.309		
	Total	**3**	**69**		**11.366**	**5.14**		**1.925**	**10.84**
2018	Shallow	2	46	1.619	7.448	3.37	0.274	1.262	7.11
	Medium	1	23	1.704	3.918	1.77	0.288	0.663	3.73
	Deep			1.828			0.309		
	Total	**3**	**69**		**11.366**	**5.14**		**1.925**	**10.84**
2019	Shallow	2	46	1.619	7.448	3.37	0.274	1.262	7.11
	Medium	1	23	1.704	3.918	1.77	0.288	0.663	3.73
	Deep			1.828			0.309		
	Total	**3**	**69**		**11.366**	**5.14**		**1.925**	**10.84**
2020	Shallow	2	46	1.619	7.448	3.37	0.274	1.262	7.11
	Medium	1	23	1.704	3.918	1.77	0.288	0.663	3.73
	Deep			1.828			0.309		
	Total	**3**	**69**		**11.366**	**5.14**		**1.925**	**10.84**
2021	Shallow	2	46	1.619	7.448	3.37	0.274	1.262	7.11
	Medium	1	23	1.704	3.918	1.77	0.288	0.663	3.73
	Deep			1.828			0.309		
	Total	**3**	**69**		**11.366**	**5.14**		**1.925**	**10.84**
2022	Shallow	2	46	1.619	7.448	3.37	0.274	1.262	7.11
	Medium	1	23	1.704	3.918	1.77	0.288	0.663	3.73
	Deep			1.828			0.309		
	Total	**3**	**69**		**11.366**	**5.14**		**1.925**	**10.84**
2023	Shallow	2	46	1.619	7.448	3.37	0.274	1.262	7.11
	Medium	1	23	1.704	3.918	1.77	0.288	0.663	3.73
	Deep			1.828			0.309		
	Total	**3**	**69**		**11.366**	**5.14**		**1.925**	**10.84**
2024	Shallow	2	46	1.619	7.448	3.37	0.274	1.262	7.11
	Medium	1	23	1.704	3.918	1.77	0.288	0.663	3.73

Table 4.1.3
Arctic Spill Occurrence - Sale 1 - Platforms

Year	Water Depth	N Platforms	N P Wells	Small and Medium Spills 50-999 bbl			Large and Huge Spills =>1000 bbl		
				Expected Spill [bbl] =		452	Expected Spill [bbl] =		5631
		Cum.	Cum.	Frequency spills per 10^4well-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4well-year	Frequency spills per 10^3years	Spill Index bbl
2024	Deep			1.828			0.309		
	Total	**3**	**69**		**11.366**	**5.14**		**1.925**	**10.84**
2025	Shallow	1	23	1.619	3.724	1.68	0.274	0.631	3.55
	Medium	1	23	1.704	3.918	1.77	0.288	0.663	3.73
	Deep			1.828			0.309		
	Total	**2**	**46**		**7.642**	**3.45**		**1.294**	**7.29**
2026	Shallow	1	23	1.619	3.724	1.68	0.274	0.631	3.55
	Medium	1	23	1.704	3.918	1.77	0.288	0.663	3.73
	Deep			1.828			0.309		
	Total	**2**	**46**		**7.642**	**3.45**		**1.294**	**7.29**
2027	Shallow			1.619			0.274		
	Medium	1	23	1.704	3.918	1.77	0.288	0.663	3.73
	Deep			1.828			0.309		
	Total	**1**	**23**		**3.918**	**1.77**		**0.663**	**3.73**
2028	Shallow			1.619			0.274		
	Medium	1	23	1.704	3.918	1.77	0.288	0.663	3.73
	Deep			1.828			0.309		
	Total	**1**	**23**		**3.918**	**1.77**		**0.663**	**3.73**
2029	Shallow			1.619			0.274		
	Medium	1	23	1.704	3.918	1.77	0.288	0.663	3.73
	Deep			1.828			0.309		
	Total	**1**	**23**		**3.918**	**1.77**		**0.663**	**3.73**
2030	Shallow			1.619			0.274		
	Medium	1	23	1.704	3.918	1.77	0.288	0.663	3.73
	Deep			1.828			0.309		
	Total	**1**	**23**		**3.918**	**1.77**		**0.663**	**3.73**
2031	Shallow			1.619			0.274		
	Medium	1	23	1.704	3.918	1.77	0.288	0.663	3.73
	Deep			1.828			0.309		
	Total	**1**	**23**		**3.918**	**1.77**		**0.663**	**3.73**
2032	Shallow			1.619			0.274		
	Medium	1	23	1.704	3.918	1.77	0.288	0.663	3.73
	Deep			1.828			0.309		
	Total	**1**	**23**		**3.918**	**1.77**		**0.663**	**3.73**
2033	Shallow			1.619			0.274		
	Medium	1	23	1.704	3.918	1.77	0.288	0.663	3.73
	Deep			1.828			0.309		
	Total	**1**	**23**		**3.918**	**1.77**		**0.663**	**3.73**
2034	Shallow			1.619			0.274		
	Medium			1.704			0.288		
	Deep			1.828			0.309		
	Total								
2035	Shallow			1.619			0.274		
	Medium			1.704			0.288		
	Deep			1.828			0.309		
	Total								
2036	Shallow			1.619			0.274		
	Medium			1.704			0.288		
	Deep			1.828			0.309		
	Total								
2037	Shallow			1.619			0.274		
	Medium			1.704			0.288		
	Deep			1.828			0.309		
	Total								
2038	Shallow			1.619			0.274		
	Medium			1.704			0.288		
	Deep			1.828			0.309		
	Total								

Table 4.1.4
Arctic Spill Occurrence - Sale 1 - Platforms - Summary

Year	Production [MMbbl]	Small and Medium Spills 50-999 bbl			Large and Huge Spills =>1000 bbl			Significant Spills =>1000 bbl			All Spills		
		Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 103years	Frequency Spills per 109 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]
2004													
2005													
2006													
2007													
2008													
2009		0.486		0.220	0.082		0.463	0.082		0.463	0.568		0.683
2010	**7.9**	2.105	0.266	0.951	0.357	0.045	2.008	0.357	0.045	2.008	2.461	0.312	2.959
2011	**15.7**	4.210	0.268	1.902	0.713	0.045	4.016	0.713	0.045	4.016	4.923	0.314	5.918
2012	**23.6**	5.829	0.247	2.634	0.987	0.042	5.560	0.987	0.042	5.560	6.816	0.289	8.195
2013	**31.5**	7.448	0.236	3.366	1.262	0.040	7.105	1.262	0.040	7.105	8.710	0.277	10.471
2014	**28.7**	7.959	0.277	3.597	1.348	0.047	7.592	1.348	0.047	7.592	9.307	0.324	11.189
2015	**39.6**	9.663	0.244	4.367	1.637	0.041	9.216	1.637	0.041	9.216	11.299	0.285	13.583
2016	**43.8**	11.366	0.260	5.137	1.925	0.044	10.839	1.925	0.044	10.839	13.291	0.303	15.976
2017	**40.0**	11.366	0.284	5.137	1.925	0.048	10.839	1.925	0.048	10.839	13.291	0.332	15.976
2018	**36.8**	11.366	0.309	5.137	1.925	0.052	10.839	1.925	0.052	10.839	13.291	0.361	15.976
2019	**34.3**	11.366	0.331	5.137	1.925	0.056	10.839	1.925	0.056	10.839	13.291	0.388	15.976
2020	**29.0**	11.366	0.392	5.137	1.925	0.066	10.839	1.925	0.066	10.839	13.291	0.458	15.976
2021	**24.7**	11.366	0.460	5.137	1.925	0.078	10.839	1.925	0.078	10.839	13.291	0.538	15.976
2022	**20.9**	11.366	0.544	5.137	1.925	0.092	10.839	1.925	0.092	10.839	13.291	0.636	15.976
2023	**17.7**	11.366	0.642	5.137	1.925	0.109	10.839	1.925	0.109	10.839	13.291	0.751	15.976
2024	**15.0**	11.366	0.758	5.137	1.925	0.128	10.839	1.925	0.128	10.839	13.291	0.886	15.976
2025	**11.2**	7.642	0.682	3.454	1.294	0.116	7.287	1.294	0.116	7.287	8.936	0.798	10.741
2026	**9.6**	7.642	0.796	3.454	1.294	0.135	7.287	1.294	0.135	7.287	8.936	0.931	10.741
2027	**6.6**	3.918	0.594	1.771	0.663	0.100	3.734	0.663	0.100	3.734	4.582	0.694	5.505
2028	**5.7**	3.918	0.687	1.771	0.663	0.116	3.734	0.663	0.116	3.734	4.582	0.804	5.505
2029	**4.9**	3.918	0.800	1.771	0.663	0.135	3.734	0.663	0.135	3.734	4.582	0.935	5.505
2030	**4.2**	3.918	0.933	1.771	0.663	0.158	3.734	0.663	0.158	3.734	4.582	1.091	5.505
2031	**3.6**	3.918	1.088	1.771	0.663	0.184	3.734	0.663	0.184	3.734	4.582	1.273	5.505
2032	**3.1**	3.918	1.264	1.771	0.663	0.214	3.734	0.663	0.214	3.734	4.582	1.478	5.505
2033	**2.7**	3.918	1.451	1.771	0.663	0.246	3.734	0.663	0.246	3.734	4.582	1.697	5.505
2034													
2035													
2036													
2037													
2038													
Total LOF	**460.8**	**182.711**		**83**	**30.941**		**174**	**30.941**		**174**	**213.652**		**257**
Average LOF		**6.090**	**0.397**	**3**	**1.031**	**0.067**	**6**	**1.031**	**0.067**	**6**	**7.122**	**0.464**	**9**

Table 4.1.5
Arctic Spill Occurrence - Sale 1 - Production Wells

Year	Water Depth	Production Wells Blowout												
		N Wells	Small and Medium Spills 50-999 bbl			Large Spills 1000-9999 bbl			Spills 10000-149999 bbl			Spills =>150000 bbl		
			Expected Spill [bbl] =		**519**	Expected Spill [bbl] =		**5292**	Expected Spill [bbl] =		**68349**	Expected Spill [bbl] =		**200000**
		Cum.	Frequency spills per 10^4well-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4well-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4well-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4well-year	Frequency spills per 10^3years	Spill Index bbl
2004	Shallow		0.103			0.718			0.308			0.205		
	Medium		0.103			0.718			0.308			0.205		
	Deep		0.103			0.718			0.308			0.205		
	Total													
2005	Shallow		0.103			0.718			0.308			0.205		
	Medium		0.103			0.718			0.308			0.205		
	Deep		0.103			0.718			0.308			0.205		
	Total													
2006	Shallow		0.103			0.718			0.308			0.205		
	Medium		0.103			0.718			0.308			0.205		
	Deep		0.103			0.718			0.308			0.205		
	Total													
2007	Shallow		0.103			0.718			0.308			0.205		
	Medium		0.103			0.718			0.308			0.205		
	Deep		0.103			0.718			0.308			0.205		
	Total													
2008	Shallow		0.103			0.718			0.308			0.205		
	Medium		0.103			0.718			0.308			0.205		
	Deep		0.103			0.718			0.308			0.205		
	Total													
2009	Shallow	3	0.103	0.031	0.02	0.718	0.215	1.14	0.308	0.092	6.31	0.205	0.062	12.31
	Medium		0.103			0.718			0.308			0.205		
	Deep		0.103			0.718			0.308			0.205		
	Total	**3**		0.031	**0.02**		0.215	**1.14**		0.092	**6.31**		0.062	**12.31**
2010	Shallow	13	0.103	0.133	0.07	0.718	0.934	4.94	0.308	0.400	27.35	0.205	0.267	53.36
	Medium		0.103			0.718			0.308			0.205		
	Deep		0.103			0.718			0.308			0.205		
	Total	**13**		0.133	**0.07**		0.934	**4.94**		0.400	**27.35**		0.267	**53.36**
2011	Shallow	26	0.103	0.267	0.14	0.718	1.868	9.88	0.308	0.800	54.71	0.205	0.534	106.72
	Medium		0.103			0.718			0.308			0.205		
	Deep		0.103			0.718			0.308			0.205		
	Total	**26**		0.267	**0.14**		1.868	**9.88**		0.800	**54.71**		0.534	**106.72**
2012	Shallow	36	0.103	0.369	0.19	0.718	2.586	13.68	0.308	1.108	75.75	0.205	0.739	147.76
	Medium		0.103			0.718			0.308			0.205		
	Deep		0.103			0.718			0.308			0.205		
	Total	**36**		0.369	**0.19**		2.586	**13.68**		1.108	**75.75**		0.739	**147.76**
2013	Shallow	46	0.103	0.472	0.25	0.718	3.304	17.49	0.308	1.416	96.79	0.205	0.944	188.81
	Medium		0.103			0.718			0.308			0.205		
	Deep		0.103			0.718			0.308			0.205		
	Total	**46**		0.472	**0.25**		3.304	**17.49**		1.416	**96.79**		0.944	**188.81**
2014	Shallow	46	0.103	0.472	0.25	0.718	3.304	17.49	0.308	1.416	96.79	0.205	0.944	188.81
	Medium	3	0.103	0.031	0.02	0.718	0.215	1.14	0.308	0.092	6.31	0.205	0.062	12.31
	Deep		0.103			0.718			0.308			0.205		
	Total	**49**		0.503	**0.26**		3.520	**18.63**		1.508	**103.10**		1.006	**201.12**
2015	Shallow	46	0.103	0.472	0.25	0.718	3.304	17.49	0.308	1.416	96.79	0.205	0.944	188.81
	Medium	13	0.103	0.133	0.07	0.718	0.934	4.94	0.308	0.400	27.35	0.205	0.267	53.36
	Deep		0.103			0.718			0.308			0.205		
	Total	**59**		0.605	**0.31**		4.238	**22.43**		1.816	**124.14**		1.211	**242.17**
2016	Shallow	46	0.103	0.472	0.25	0.718	3.304	17.49	0.308	1.416	96.79	0.205	0.944	188.81
	Medium	23	0.103	0.236	0.12	0.718	1.652	8.74	0.308	0.708	48.39	0.205	0.472	94.40
	Deep		0.103			0.718			0.308			0.205		
	Total	**69**		0.708	**0.37**		4.956	**26.23**		2.124	**145.18**		1.416	**283.21**
2017	Shallow	46	0.103	0.472	0.25	0.718	3.304	17.49	0.308	1.416	96.79	0.205	0.944	188.81
	Medium	23	0.103	0.236	0.12	0.718	1.652	8.74	0.308	0.708	48.39	0.205	0.472	94.40
	Deep		0.103			0.718			0.308			0.205		
	Total	**69**		0.708	**0.37**		4.956	**26.23**		2.124	**145.18**		1.416	**283.21**
2018	Shallow	46	0.103	0.472	0.25	0.718	3.304	17.49	0.308	1.416	96.79	0.205	0.944	188.81
	Medium	23	0.103	0.236	0.12	0.718	1.652	8.74	0.308	0.708	48.39	0.205	0.472	94.40
	Deep		0.103			0.718			0.308			0.205		
	Total	**69**		0.708	**0.37**		4.956	**26.23**		2.124	**145.18**		1.416	**283.21**
2019	Shallow	46	0.103	0.472	0.25	0.718	3.304	17.49	0.308	1.416	96.79	0.205	0.944	188.81
	Medium	23	0.103	0.236	0.12	0.718	1.652	8.74	0.308	0.708	48.39	0.205	0.472	94.40
	Deep		0.103			0.718			0.308			0.205		
	Total	**69**		0.708	**0.37**		4.956	**26.23**		2.124	**145.18**		1.416	**283.21**
2020	Shallow	46	0.103	0.472	0.25	0.718	3.304	17.49	0.308	1.416	96.79	0.205	0.944	188.81
	Medium	23	0.103	0.236	0.12	0.718	1.652	8.74	0.308	0.708	48.39	0.205	0.472	94.40
	Deep		0.103			0.718			0.308			0.205		
	Total	**69**		0.708	**0.37**		4.956	**26.23**		2.124	**145.18**		1.416	**283.21**
2021	Shallow	46	0.103	0.472	0.25	0.718	3.304	17.49	0.308	1.416	96.79	0.205	0.944	188.81
	Medium	23	0.103	0.236	0.12	0.718	1.652	8.74	0.308	0.708	48.39	0.205	0.472	94.40
	Deep		0.103			0.718			0.308			0.205		
	Total	**69**		0.708	**0.37**		4.956	**26.23**		2.124	**145.18**		1.416	**283.21**
2022	Shallow	46	0.103	0.472	0.25	0.718	3.304	17.49	0.308	1.416	96.79	0.205	0.944	188.81
	Medium	23	0.103	0.236	0.12	0.718	1.652	8.74	0.308	0.708	48.39	0.205	0.472	94.40
	Deep		0.103			0.718			0.308			0.205		
	Total	**69**		0.708	**0.37**		4.956	**26.23**		2.124	**145.18**		1.416	**283.21**
2023	Shallow	46	0.103	0.472	0.25	0.718	3.304	17.49	0.308	1.416	96.79	0.205	0.944	188.81
	Medium	23	0.103	0.236	0.12	0.718	1.652	8.74	0.308	0.708	48.39	0.205	0.472	94.40
	Deep		0.103			0.718			0.308			0.205		
	Total	**69**		0.708	**0.37**		4.956	**26.23**		2.124	**145.18**		1.416	**283.21**
2024	Shallow	46	0.103	0.472	0.25	0.718	3.304	17.49	0.308	1.416	96.79	0.205	0.944	188.81
	Medium	23	0.103	0.236	0.12	0.718	1.652	8.74	0.308	0.708	48.39	0.205	0.472	94.40

Table 4.1.5
Arctic Spill Occurrence - Sale 1 - Production Wells

Year	Water Depth	Production Wells Blowout												
		N Wells	Small and Medium Spills 50-999 bbl			Large Spills 1000-9999 bbl			Spills 10000-149999 bbl			Spills =>150000 bbl		
			Expected Spill [bbl] =		**519**	Expected Spill [bbl] =		**5292**	Expected Spill [bbl] =		**68349**	Expected Spill [bbl] =		**200000**
		Cum.	Frequency spills per 10^4well-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4well-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4well-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4well-year	Frequency spills per 10^3years	Spill Index bbl
2024	Deep		0.103			0.718			0.308			0.205		
	Total	**69**		0.708	**0.37**		4.956	**26.23**		2.124	**145.18**		1.416	**283.21**
2025	Shallow	23	0.103	0.236	0.12	0.718	1.652	8.74	0.308	0.708	48.39	0.205	0.472	94.40
	Medium	23	0.103	0.236	0.12	0.718	1.652	8.74	0.308	0.708	48.39	0.205	0.472	94.40
	Deep		0.103			0.718			0.308			0.205		
	Total	**46**		0.472	**0.25**		3.304	**17.49**		1.416	**96.79**		0.944	**188.81**
2026	Shallow	23	0.103	0.236	0.12	0.718	1.652	8.74	0.308	0.708	48.39	0.205	0.472	94.40
	Medium	23	0.103	0.236	0.12	0.718	1.652	8.74	0.308	0.708	48.39	0.205	0.472	94.40
	Deep		0.103			0.718			0.308			0.205		
	Total	**46**		0.472	**0.25**		3.304	**17.49**		1.416	**96.79**		0.944	**188.81**
2027	Shallow		0.103			0.718			0.308			0.205		
	Medium	23	0.103	0.236	0.12	0.718	1.652	8.74	0.308	0.708	48.39	0.205	0.472	94.40
	Deep		0.103			0.718			0.308			0.205		
	Total	**23**		0.236	**0.12**		1.652	**8.74**		0.708	**48.39**		0.472	**94.40**
2028	Shallow		0.103			0.718			0.308			0.205		
	Medium	23	0.103	0.236	0.12	0.718	1.652	8.74	0.308	0.708	48.39	0.205	0.472	94.40
	Deep		0.103			0.718			0.308			0.205		
	Total	**23**		0.236	**0.12**		1.652	**8.74**		0.708	**48.39**		0.472	**94.40**
2029	Shallow		0.103			0.718			0.308			0.205		
	Medium	23	0.103	0.236	0.12	0.718	1.652	8.74	0.308	0.708	48.39	0.205	0.472	94.40
	Deep		0.103			0.718			0.308			0.205		
	Total	**23**		0.236	**0.12**		1.652	**8.74**		0.708	**48.39**		0.472	**94.40**
2030	Shallow		0.103			0.718			0.308			0.205		
	Medium	23	0.103	0.236	0.12	0.718	1.652	8.74	0.308	0.708	48.39	0.205	0.472	94.40
	Deep		0.103			0.718			0.308			0.205		
	Total	**23**		0.236	**0.12**		1.652	**8.74**		0.708	**48.39**		0.472	**94.40**
2031	Shallow		0.103			0.718			0.308			0.205		
	Medium	23	0.103	0.236	0.12	0.718	1.652	8.74	0.308	0.708	48.39	0.205	0.472	94.40
	Deep		0.103			0.718			0.308			0.205		
	Total	**23**		0.236	**0.12**		1.652	**8.74**		0.708	**48.39**		0.472	**94.40**
2032	Shallow		0.103			0.718			0.308			0.205		
	Medium	23	0.103	0.236	0.12	0.718	1.652	8.74	0.308	0.708	48.39	0.205	0.472	94.40
	Deep		0.103			0.718			0.308			0.205		
	Total	**23**		0.236	**0.12**		1.652	**8.74**		0.708	**48.39**		0.472	**94.40**
2033	Shallow		0.103			0.718			0.308			0.205		
	Medium	23	0.103	0.236	0.12	0.718	1.652	8.74	0.308	0.708	48.39	0.205	0.472	94.40
	Deep		0.103			0.718			0.308			0.205		
	Total	**23**		0.236	**0.12**		1.652	**8.74**		0.708	**48.39**		0.472	**94.40**
2034	Shallow		0.103			0.718			0.308			0.205		
	Medium		0.103			0.718			0.308			0.205		
	Deep		0.103			0.718			0.308			0.205		
	Total													
2035	Shallow		0.103			0.718			0.308			0.205		
	Medium		0.103			0.718			0.308			0.205		
	Deep		0.103			0.718			0.308			0.205		
	Total													
2036	Shallow		0.103			0.718			0.308			0.205		
	Medium		0.103			0.718			0.308			0.205		
	Deep		0.103			0.718			0.308			0.205		
	Total													
2037	Shallow		0.103			0.718			0.308			0.205		
	Medium		0.103			0.718			0.308			0.205		
	Deep		0.103			0.718			0.308			0.205		
	Total													
2038	Shallow		0.103			0.718			0.308			0.205		
	Medium		0.103			0.718			0.308			0.205		
	Deep		0.103			0.718			0.308			0.205		
	Total													

Table 4.1.6
Arctic Spill Occurrence - Sale 1 - Production Wells - Summary

Year	Production [MMbbl]	Small and Medium Spills 50-99 bbl			Large Spills 1000-9999 bbl			Huge Spills =>10000 bbl			All Spills		
		Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]
2004													
2005													
2006													
2007													
2008													
2009		0.031		0.016	0.092		1.140	0.154		18.626	0.277		19.782
2010	**7.9**	0.133	0.017	0.069	0.400	0.051	4.942	0.667	0.084	80.712	1.201	0.152	85.723
2011	**15.7**	0.267	0.017	0.139	0.800	0.051	9.883	1.334	0.085	161.423	2.401	0.153	171.445
2012	**23.6**	0.369	0.016	0.192	1.108	0.047	13.685	1.847	0.078	223.509	3.325	0.141	237.386
2013	**31.5**	0.472	0.015	0.245	1.416	0.045	17.486	2.360	0.075	285.595	4.248	0.135	303.326
2014	**28.7**	0.503	0.018	0.261	1.508	0.053	18.626	2.514	0.088	304.221	4.525	0.158	323.108
2015	**39.6**	0.605	0.015	0.314	1.816	0.046	22.428	3.027	0.076	366.307	5.449	0.138	389.049
2016	**43.8**	0.708	0.016	0.368	2.124	0.048	26.229	3.540	0.081	428.392	6.372	0.145	454.989
2017	**40.0**	0.708	0.018	0.368	2.124	0.053	26.229	3.540	0.089	428.392	6.372	0.159	454.989
2018	**36.8**	0.708	0.019	0.368	2.124	0.058	26.229	3.540	0.096	428.392	6.372	0.173	454.989
2019	**34.3**	0.708	0.021	0.368	2.124	0.062	26.229	3.540	0.103	428.392	6.372	0.186	454.989
2020	**29.0**	0.708	0.024	0.368	2.124	0.073	26.229	3.540	0.122	428.392	6.372	0.220	454.989
2021	**24.7**	0.708	0.029	0.368	2.124	0.086	26.229	3.540	0.143	428.392	6.372	0.258	454.989
2022	**20.9**	0.708	0.034	0.368	2.124	0.102	26.229	3.540	0.169	428.392	6.372	0.305	454.989
2023	**17.7**	0.708	0.040	0.368	2.124	0.120	26.229	3.540	0.200	428.392	6.372	0.360	454.989
2024	**15.0**	0.708	0.047	0.368	2.124	0.142	26.229	3.540	0.236	428.392	6.372	0.425	454.989
2025	**11.2**	0.472	0.042	0.245	1.416	0.126	17.486	2.360	0.211	285.595	4.248	0.379	303.326
2026	**9.6**	0.472	0.049	0.245	1.416	0.148	17.486	2.360	0.246	285.595	4.248	0.443	303.326
2027	**6.6**	0.236	0.036	0.123	0.708	0.107	8.743	1.180	0.179	142.797	2.124	0.322	151.663
2028	**5.7**	0.236	0.041	0.123	0.708	0.124	8.743	1.180	0.207	142.797	2.124	0.373	151.663
2029	**4.9**	0.236	0.048	0.123	0.708	0.144	8.743	1.180	0.241	142.797	2.124	0.433	151.663
2030	**4.2**	0.236	0.056	0.123	0.708	0.169	8.743	1.180	0.281	142.797	2.124	0.506	151.663
2031	**3.6**	0.236	0.066	0.123	0.708	0.197	8.743	1.180	0.328	142.797	2.124	0.590	151.663
2032	**3.1**	0.236	0.076	0.123	0.708	0.228	8.743	1.180	0.381	142.797	2.124	0.685	151.663
2033	**2.7**	0.236	0.087	0.123	0.708	0.262	8.743	1.180	0.437	142.797	2.124	0.787	151.663
2034													
2035													
2036													
2037													
2038													

Table 4.1.7
Occurrence Spill Risks - Sale 1 - Exploration Wells

Year	Water Depth	Exploration Wells Blowout												
		N Wells	Small and Medium Spills 50-999 bbl			Large Spills 1000-9999 bbl			Spills 10000-149999 bbl			Spills =>150000 bbl		
			Expected Spill [bbl] =		519	Expected Spill [bbl] =		5292	Expected Spill [bbl] =		68349	Expected Spill [bbl] =		200000
		Cum.	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl
2004	Shallow	1	1.583	0.158	0.08	11.077	1.108	5.86	4.759	0.476	32.53	2.755	0.276	55.11
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total	**1**		0.158	**0.08**		1.108	**5.86**		0.476	**32.53**		0.276	**55.11**
2005	Shallow	1	1.583	0.158	0.08	11.077	1.108	5.86	4.759	0.476	32.53	2.755	0.276	55.11
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total	**1**		0.158	**0.08**		1.108	**5.86**		0.476	**32.53**		0.276	**55.11**
2006	Shallow	1	1.583	0.158	0.08	11.077	1.108	5.86	4.759	0.476	32.53	2.755	0.276	55.11
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total	**1**		0.158	**0.08**		1.108	**5.86**		0.476	**32.53**		0.276	**55.11**
2007	Shallow	1	1.583	0.158	0.08	11.077	1.108	5.86	4.759	0.476	32.53	2.755	0.276	55.11
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total	**1**		0.158	**0.08**		1.108	**5.86**		0.476	**32.53**		0.276	**55.11**
2008	Shallow		1.583			11.077			4.759			2.755		
	Medium	1	1.809	0.181	0.09	12.659	1.266	6.70	5.439	0.544	37.18	3.149	0.315	62.98
	Deep		2.035			14.242			6.119			3.543		
	Total	**1**		0.181	**0.09**		1.266	**6.70**		0.544	**37.18**		0.315	**62.98**
2009	Shallow		1.583			11.077			4.759			2.755		
	Medium	1	1.809	0.181	0.09	12.659	1.266	6.70	5.439	0.544	37.18	3.149	0.315	62.98
	Deep		2.035			14.242			6.119			3.543		
	Total	**1**		0.181	**0.09**		1.266	**6.70**		0.544	**37.18**		0.315	**62.98**
2010	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2011	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2012	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2013	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2014	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2015	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2016	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2017	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2018	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2019	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2020	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2021	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2022	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2023	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2024	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2025	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2026	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2027	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2028	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2029	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													

Table 4.1.7
Occurrence Spill Risks - Sale 1 - Exploration Wells

Year	Water Depth	Exploration Wells Blowout												
		N Wells	Small and Medium Spills 50-999 bbl			Large Spills 1000-9999 bbl			Spills 10000-149999 bbl			Spills =>150000 bbl		
			Expected Spill [bbl] =		**519**	Expected Spill [bbl] =		**5292**	Expected Spill [bbl] =		**68349**	Expected Spill [bbl] =		**200000**
		Cum.	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl
2030	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2031	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2032	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2033	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2034	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2035	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2036	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2037	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2038	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													

Table 4.1.8
Arctic Spill Occurrence - Sale 1 - Exploration Wells - Summary

Year	Production [MMbbl]	Small and Medium Spills 50-99 bbl			Large Spills 1000-9999 bbl			Huge Spills =>10000 bbl			All Spills		
		Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]
2004		0.158		0.082	0.476		5.862	0.751		87.639	1.386		93.583
2005		0.158		0.082	0.476		5.862	0.751		87.639	1.386		93.583
2006		0.158		0.082	0.476		5.862	0.751		87.639	1.386		93.583
2007		0.158		0.082	0.476		5.862	0.751		87.639	1.386		93.583
2008		0.181		0.094	0.544		6.699	0.859		100.159	1.584		106.952
2009		0.181		0.094	0.544		6.699	0.859		100.159	1.584		106.952
2010	**7.9**												
2011	**15.7**												
2012	**23.6**												
2013	**31.5**												
2014	**28.7**												
2015	**39.6**												
2016	**43.8**												
2017	**40.0**												
2018	**36.8**												
2019	**34.3**												
2020	**29.0**												
2021	**24.7**												
2022	**20.9**												
2023	**17.7**												
2024	**15.0**												
2025	**11.2**												
2026	**9.6**												
2027	**6.6**												
2028	**5.7**												
2029	**4.9**												
2030	**4.2**												
2031	**3.6**												
2032	**3.1**												
2033	**2.7**												
2034													
2035													
2036													
2037													
2038													

Table 4.1.9
Arctic Spill Occurrence Beaufort Sea Sale 1 Development Wells

Year	Water Depth	Development Wells Blowout												
		N Wells	Small and Medium Spills 50-999 bbl			Large Spills 1000-9999 bbl			Spills 10000-149999 bbl			Spills =>150000 bbl		
			Expected Spill [bbl] =		**519**	Expected Spill [bbl] =		**5292**	Expected Spill [bbl] =		**68349**	Expected Spill [bbl] =		**200000**
		Cum.	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl
2004	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2005	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2006	Shallow	2	0.484	0.097	0.05	3.383	0.677	3.58	1.453	0.291	19.87	1.453	0.291	58.13
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total	**2**		0.097	**0.05**		0.677	**3.58**		0.291	**19.87**		0.291	**58.13**
2007	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2008	Shallow	2	0.484	0.097	0.05	3.383	0.677	3.58	1.453	0.291	19.87	1.453	0.291	58.13
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total	**2**		0.097	**0.05**		0.677	**3.58**		0.291	**19.87**		0.291	**58.13**
2009	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2010	Shallow		0.484			3.383			1.453			1.453		
	Medium	2	0.554	0.111	0.06	3.867	0.773	4.09	1.661	0.332	22.70	1.661	0.332	66.43
	Deep		0.623			4.350			1.868			1.868		
	Total	**2**		0.111	**0.06**		0.773	**4.09**		0.332	**22.70**		0.332	**66.43**
2011	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2012	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2013	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2014	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2015	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2016	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2017	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2018	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2019	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2020	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2021	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2022	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2023	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2024	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2025	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2026	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2027	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2028	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2029	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													

Table 4.1.9
Arctic Spill Occurrence Beaufort Sea Sale 1 Development Wells

Year	Water Depth	Development Wells Blowout												
		N Wells	Small and Medium Spills 50-999 bbl			Large Spills 1000-9999 bbl			Spills 10000-149999 bbl			Spills =>150000 bbl		
			Expected Spill [bbl] =		519	Expected Spill [bbl] =		5292	Expected Spill [bbl] =		68349	Expected Spill [bbl] =		200000
		Cum.	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl
2030	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2031	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2032	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2033	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2034	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2035	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2036	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2037	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2038	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													

Table 4.1.10
Arctic Spill Occurrence - Sale 1 - Development Wells - Summary

Year	Production [MMbbl]	Small and Medium Spills 50-99 bbl			Large Spills 1000-9999 bbl			Huge Spills =>10000 bbl			All Spills		
		Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]
2004													
2005													
2006		0.097		0.050	0.291		3.581	0.581		77.994	0.969		81.626
2007													
2008		0.097		0.050	0.291		3.581	0.581		77.994	0.969		81.626
2009													
2010	**7.9**	0.111	0.014	0.058	0.332	0.042	4.093	0.664	0.084	89.136	1.107	0.140	93.287
2011	**15.7**												
2012	**23.6**												
2013	**31.5**												
2014	**28.7**												
2015	**39.6**												
2016	**43.8**												
2017	**40.0**												
2018	**36.8**												
2019	**34.3**												
2020	**29.0**												
2021	**24.7**												
2022	**20.9**												
2023	**17.7**												
2024	**15.0**												
2025	**11.2**												
2026	**9.6**												
2027	**6.6**												
2028	**5.7**												
2029	**4.9**												
2030	**4.2**												
2031	**3.6**												
2032	**3.1**												
2033	**2.7**												
2034													
2035													
2036													
2037													
2038													

Table 4.1.11
Arctic Spill Occurrence - Sale 1 - Wells - Summary

Year	Production [MMbbl]	Small and Medium Spills 50-999 bbl			Large Spills 1000-9999 bbl			Huge Spills =>10000 bbl			Significant Spills =>1000 bbl			All Spills		
		Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 103years	Frequency Spills per 109 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]
2004		0.158		0.082	0.476		5.862	0.751		87.639	1.227		93.501	1.386		93.583
2005		0.158		0.082	0.476		5.862	0.751		87.639	1.227		93.501	1.386		93.583
2006		0.255		0.133	0.767		9.443	1.333		165.633	2.099		175.077	2.355		175.209
2007		0.158		0.082	0.476		5.862	0.751		87.639	1.227		93.501	1.386		93.583
2008		0.278		0.144	0.835		10.281	1.440		178.153	2.275		188.434	2.553		188.578
2009		0.212		0.110	0.636		7.840	1.013		118.785	1.649		126.625	1.861		126.735
2010	**7.9**	0.244	0.031	0.127	0.732	0.093	9.034	1.331	0.169	169.848	2.064	0.261	178.882	2.308	0.292	179.009
2011	**15.7**	0.267	0.017	0.139	0.800	0.051	9.883	1.334	0.085	161.423	2.134	0.136	171.307	2.401	0.153	171.445
2012	**23.6**	0.369	0.016	0.192	1.108	0.047	13.685	1.847	0.078	223.509	2.955	0.125	237.194	3.325	0.141	237.386
2013	**31.5**	0.472	0.015	0.245	1.416	0.045	17.486	2.360	0.075	285.595	3.776	0.120	303.081	4.248	0.135	303.326
2014	**28.7**	0.503	0.018	0.261	1.508	0.053	18.626	2.514	0.088	304.221	4.022	0.140	322.847	4.525	0.158	323.108
2015	**39.6**	0.605	0.015	0.314	1.816	0.046	22.428	3.027	0.076	366.307	4.843	0.122	388.734	5.449	0.138	389.049
2016	**43.8**	0.708	0.016	0.368	2.124	0.048	26.229	3.540	0.081	428.392	5.664	0.129	454.621	6.372	0.145	454.989
2017	**40.0**	0.708	0.018	0.368	2.124	0.053	26.229	3.540	0.089	428.392	5.664	0.142	454.621	6.372	0.159	454.989
2018	**36.8**	0.708	0.019	0.368	2.124	0.058	26.229	3.540	0.096	428.392	5.664	0.154	454.621	6.372	0.173	454.989
2019	**34.3**	0.708	0.021	0.368	2.124	0.062	26.229	3.540	0.103	428.392	5.664	0.165	454.621	6.372	0.186	454.989
2020	**29.0**	0.708	0.024	0.368	2.124	0.073	26.229	3.540	0.122	428.392	5.664	0.195	454.621	6.372	0.220	454.989
2021	**24.7**	0.708	0.029	0.368	2.124	0.086	26.229	3.540	0.143	428.392	5.664	0.229	454.621	6.372	0.258	454.989
2022	**20.9**	0.708	0.034	0.368	2.124	0.102	26.229	3.540	0.169	428.392	5.664	0.271	454.621	6.372	0.305	454.989
2023	**17.7**	0.708	0.040	0.368	2.124	0.120	26.229	3.540	0.200	428.392	5.664	0.320	454.621	6.372	0.360	454.989
2024	**15.0**	0.708	0.047	0.368	2.124	0.142	26.229	3.540	0.236	428.392	5.664	0.378	454.621	6.372	0.425	454.989
2025	**11.2**	0.472	0.042	0.245	1.416	0.126	17.486	2.360	0.211	285.595	3.776	0.337	303.081	4.248	0.379	303.326
2026	**9.6**	0.472	0.049	0.245	1.416	0.148	17.486	2.360	0.246	285.595	3.776	0.393	303.081	4.248	0.443	303.326
2027	**6.6**	0.236	0.036	0.123	0.708	0.107	8.743	1.180	0.179	142.797	1.888	0.286	151.540	2.124	0.322	151.663
2028	**5.7**	0.236	0.041	0.123	0.708	0.124	8.743	1.180	0.207	142.797	1.888	0.331	151.540	2.124	0.373	151.663
2029	**4.9**	0.236	0.048	0.123	0.708	0.144	8.743	1.180	0.241	142.797	1.888	0.385	151.540	2.124	0.433	151.663
2030	**4.2**	0.236	0.056	0.123	0.708	0.169	8.743	1.180	0.281	142.797	1.888	0.450	151.540	2.124	0.506	151.663
2031	**3.6**	0.236	0.066	0.123	0.708	0.197	8.743	1.180	0.328	142.797	1.888	0.524	151.540	2.124	0.590	151.663
2032	**3.1**	0.236	0.076	0.123	0.708	0.228	8.743	1.180	0.381	142.797	1.888	0.609	151.540	2.124	0.685	151.663
2033	**2.7**	0.236	0.087	0.123	0.708	0.262	8.743	1.180	0.437	142.797	1.888	0.699	151.540	2.124	0.787	151.663
2034																
2035																
2036																
2037																
2038																
Total LOF	**460.8**	**12.649**		**7**	**37.952**		**469**	**63.296**		**7663**	**101.248**		**8131**	**113.897**		**8138**
Average LOF		**0.422**	**0.027**	**0**	**1.265**	**0.082**	**16**	**2.110**	**0.137**	**255**	**3.375**	**0.220**	**271**	**3.797**	**0.247**	**271**

Table 4.1.12
Arctic Spill Occurrence - Sale 1 - Summary

Year	Facility	Production [MMbbl]	Small and Medium Spills 50-999 bbl			Large Spills 1000-9999 bbl			Huge Spills =>10000 bbl			All Spills		
			Frequency Spills per 10^3 years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3 years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3 years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3 years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]
2004	Pipeline													
	Platforms													
	Production Wells													
	Exploration Wells		0.158		0.082	0.476		5.862	0.751		87.639	1.386		93.583
	Development Wells													
	Total		0.158		0.082	0.476		5.862	0.751		87.639	1.386		93.583
2005	Pipeline													
	Platforms													
	Production Wells													
	Exploration Wells		0.158		0.082	0.476		5.862	0.751		87.639	1.386		93.583
	Development Wells													
	Total		0.158		0.082	0.476		5.862	0.751		87.639	1.386		93.583
2006	Pipeline													
	Platforms													
	Production Wells													
	Exploration Wells		0.158		0.082	0.476		5.862	0.751		87.639	1.386		93.583
	Development Wells		0.097		0.050	0.291		3.581	0.581		77.994	0.969		81.626
	Total		0.255		0.133	0.767		9.443	1.333		165.633	2.355		175.209
2007	Pipeline													
	Platforms													
	Production Wells													
	Exploration Wells		0.158		0.082	0.476		5.862	0.751		87.639	1.386		93.583
	Development Wells													
	Total		0.158		0.082	0.476		5.862	0.751		87.639	1.386		93.583
2008	Pipeline													
	Platforms													
	Production Wells													
	Exploration Wells		0.181		0.094	0.544		6.699	0.859		100.159	1.584		106.952
	Development Wells		0.097		0.050	0.291		3.581	0.581		77.994	0.969		81.626
	Total		0.278		0.144	0.835		10.281	1.440		178.153	2.553		188.578
2009	Pipeline													
	Platforms		0.486		0.220	0.041		0.232	0.041		0.232	0.568		0.683
	Production Wells		0.031		0.016	0.092		1.140	0.154		18.626	0.277		19.782
	Exploration Wells		0.181		0.094	0.544		6.699	0.859		100.159	1.584		106.952
	Development Wells													
	Total		0.697		0.329	0.677		8.072	1.054		119.016	2.429		127.417
2010	Pipeline	7.9	1.367	0.173	0.525	1.105	0.140	5.721	0.354	0.045	5.504	2.826	0.358	11.751
	Platforms		2.105	0.266	0.951	0.178	0.023	1.004	0.178	0.023	1.004	2.461	0.312	2.959
	Production Wells		0.133	0.017	0.069	0.400	0.051	4.942	0.667	0.084	80.712	1.201	0.152	85.723
	Exploration Wells													
	Development Wells		0.111	0.014	0.058	0.332	0.042	4.093	0.664	0.084	89.136	1.107	0.140	93.287
	Total		3.716	0.470	1.603	2.016	0.255	15.760	1.864	0.236	176.356	7.595	0.961	193.719
2011	Pipeline	15.7	1.367	0.087	0.525	1.105	0.070	5.721	0.354	0.023	5.504	2.826	0.180	11.751
	Platforms		4.210	0.268	1.902	0.357	0.023	2.008	0.357	0.023	2.008	4.923	0.314	5.918
	Production Wells		0.267	0.017	0.139	0.800	0.051	9.883	1.334	0.085	161.423	2.401	0.153	171.445
	Exploration Wells													
	Development Wells													
	Total		5.843	0.372	2.566	2.262	0.144	17.613	2.045	0.130	168.936	10.150	0.647	189.114
2012	Pipeline	23.6	2.734	0.116	1.050	2.211	0.094	11.443	0.708	0.030	11.009	5.652	0.240	23.501
	Platforms		5.829	0.247	2.634	0.494	0.021	2.780	0.494	0.021	2.780	6.816	0.289	8.195
	Production Wells		0.369	0.016	0.192	1.108	0.047	13.685	1.847	0.078	223.509	3.325	0.141	237.386
	Exploration Wells													
	Development Wells													
	Total		8.932	0.378	3.876	3.813	0.162	27.908	3.049	0.129	237.298	15.793	0.669	269.082
2013	Pipeline	31.5	2.734	0.087	1.050	2.211	0.070	11.443	0.708	0.022	11.009	5.652	0.179	23.501
	Platforms		7.448	0.236	3.366	0.631	0.020	3.553	0.631	0.020	3.553	8.710	0.277	10.471
	Production Wells		0.472	0.015	0.245	1.416	0.045	17.486	2.360	0.075	285.595	4.248	0.135	303.326
	Exploration Wells													
	Development Wells													
	Total		10.654	0.338	4.661	4.258	0.135	32.481	3.699	0.117	300.156	18.610	0.591	337.298
2014	Pipeline	28.7	2.734	0.095	1.050	2.211	0.077	11.443	0.708	0.025	11.009	5.652	0.197	23.501
	Platforms		7.959	0.277	3.597	0.674	0.023	3.796	0.674	0.023	3.796	9.307	0.324	11.189
	Production Wells		0.503	0.018	0.261	1.508	0.053	18.626	2.514	0.088	304.221	4.525	0.158	323.108
	Exploration Wells													
	Development Wells													
	Total		11.195	0.390	4.908	4.393	0.153	33.865	3.896	0.136	319.026	19.485	0.679	357.798
2015	Pipeline	39.6	5.429	0.137	2.086	4.358	0.110	22.557	1.398	0.035	21.735	11.185	0.282	46.379
	Platforms		9.663	0.244	4.367	0.818	0.021	4.608	0.818	0.021	4.608	11.299	0.285	13.583
	Production Wells		0.605	0.015	0.314	1.816	0.046	22.428	3.027	0.076	366.307	5.449	0.138	389.049
	Exploration Wells													
	Development Wells													
	Total		15.697	0.396	6.767	6.993	0.177	49.593	5.243	0.132	392.650	27.933	0.705	449.010
2016	Pipeline	43.8	5.429	0.124	2.086	4.358	0.100	22.557	1.398	0.032	21.735	11.185	0.255	46.379
	Platforms		11.366	0.260	5.137	0.962	0.022	5.420	0.962	0.022	5.420	13.291	0.303	15.976
	Production Wells		0.708	0.016	0.368	2.124	0.048	26.229	3.540	0.081	428.392	6.372	0.145	454.989
	Exploration Wells													
	Development Wells													
	Total		17.504	0.400	7.591	7.445	0.170	54.206	5.900	0.135	455.547	30.849	0.704	517.344
2017	Pipeline	40.0	5.429	0.136	2.086	4.358	0.109	22.557	1.398	0.035	21.735	11.185	0.280	46.379
	Platforms		11.366	0.284	5.137	0.962	0.024	5.420	0.962	0.024	5.420	13.291	0.332	15.976
	Production Wells		0.708	0.018	0.368	2.124	0.053	26.229	3.540	0.089	428.392	6.372	0.159	454.989
	Exploration Wells													
	Development Wells													
	Total		17.504	0.438	7.591	7.445	0.186	54.206	5.900	0.148	455.547	30.849	0.771	517.344
2018	Pipeline	36.8	5.429	0.148	2.086	4.358	0.118	22.557	1.398	0.038	21.735	11.185	0.304	46.379
	Platforms		11.366	0.309	5.137	0.962	0.026	5.420	0.962	0.026	5.420	13.291	0.361	15.976
	Production Wells		0.708	0.019	0.368	2.124	0.058	26.229	3.540	0.096	428.392	6.372	0.173	454.989
	Exploration Wells													
	Development Wells													
	Total		17.504	0.476	7.591	7.445	0.202	54.206	5.900	0.160	455.547	30.849	0.838	517.344
2019	Pipeline	34.3	5.429	0.158	2.086	4.358	0.127	22.557	1.398	0.041	21.735	11.185	0.326	46.379
	Platforms		11.366	0.331	5.137	0.962	0.028	5.420	0.962	0.028	5.420	13.291	0.388	15.976
	Production Wells		0.708	0.021	0.368	2.124	0.062	26.229	3.540	0.103	428.392	6.372	0.186	454.989
	Exploration Wells													
	Development Wells													
	Total		17.504	0.510	7.591	7.445	0.217	54.206	5.900	0.172	455.547	30.849	0.899	517.344
2020	Pipeline	29.0	5.429	0.187	2.086	4.358	0.150	22.557	1.398	0.048	21.735	11.185	0.386	46.379
	Platforms		11.366	0.392	5.137	0.962	0.033	5.420	0.962	0.033	5.420	13.291	0.458	15.976
	Production Wells		0.708	0.024	0.368	2.124	0.073	26.229	3.540	0.122	428.392	6.372	0.220	454.989
	Exploration Wells													
	Development Wells													
	Total		17.504	0.604	7.591	7.445	0.257	54.206	5.900	0.203	455.547	30.849	1.064	517.344

Table 4.1.12
Arctic Spill Occurrence - Sale 1 - Summary

Year	Facility	Production [MMbbl]	Small and Medium Spills 50-999 bbl			Large Spills 1000-9999 bbl			Huge Spills =>10000 bbl			All Spills		
			Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]
2021	Pipeline	24.7	5.429	0.220	2.086	4.358	0.176	22.557	1.398	0.057	21.735	11.185	0.453	46.379
	Platforms		11.366	0.460	5.137	0.962	0.039	5.420	0.962	0.039	5.420	13.291	0.538	15.976
	Production Wells		0.708	0.029	0.368	2.124	0.086	26.229	3.540	0.143	428.392	6.372	0.258	454.989
	Exploration Wells													
	Development Wells													
	Total		17.504	0.709	7.591	7.445	0.301	54.206	5.900	0.239	455.547	30.849	1.249	517.344
2022	Pipeline	20.9	5.429	0.260	2.086	4.358	0.209	22.557	1.398	0.067	21.735	11.185	0.535	46.379
	Platforms		11.366	0.544	5.137	0.962	0.046	5.420	0.962	0.046	5.420	13.291	0.636	15.976
	Production Wells		0.708	0.034	0.368	2.124	0.102	26.229	3.540	0.169	428.392	6.372	0.305	454.989
	Exploration Wells													
	Development Wells													
	Total		17.504	0.837	7.591	7.445	0.356	54.206	5.900	0.282	455.547	30.849	1.476	517.344
2023	Pipeline	17.7	5.429	0.307	2.086	4.358	0.246	22.557	1.398	0.079	21.735	11.185	0.632	46.379
	Platforms		11.366	0.642	5.137	0.962	0.054	5.420	0.962	0.054	5.420	13.291	0.751	15.976
	Production Wells		0.708	0.040	0.368	2.124	0.120	26.229	3.540	0.200	428.392	6.372	0.360	454.989
	Exploration Wells													
	Development Wells													
	Total		17.504	0.989	7.591	7.445	0.421	54.206	5.900	0.333	455.547	30.849	1.743	517.344
2024	Pipeline	15.0	5.429	0.362	2.086	4.358	0.291	22.557	1.398	0.093	21.735	11.185	0.746	46.379
	Platforms		11.366	0.758	5.137	0.962	0.064	5.420	0.962	0.064	5.420	13.291	0.886	15.976
	Production Wells		0.708	0.047	0.368	2.124	0.142	26.229	3.540	0.236	428.392	6.372	0.425	454.989
	Exploration Wells													
	Development Wells													
	Total		17.504	1.167	7.591	7.445	0.496	54.206	5.900	0.393	455.547	30.849	2.057	517.344
2025	Pipeline	11.2	4.062	0.363	1.561	3.253	0.290	16.836	1.044	0.093	16.231	8.359	0.746	34.628
	Platforms		7.642	0.682	3.454	0.647	0.058	3.643	0.647	0.058	3.643	8.936	0.798	10.741
	Production Wells		0.472	0.042	0.245	1.416	0.126	17.486	2.360	0.211	285.595	4.248	0.379	303.326
	Exploration Wells													
	Development Wells													
	Total		12.177	1.087	5.260	5.316	0.475	37.965	4.051	0.362	305.469	21.544	1.924	348.695
2026	Pipeline	9.6	4.062	0.423	1.561	3.253	0.339	16.836	1.044	0.109	16.231	8.359	0.871	34.628
	Platforms		7.642	0.796	3.454	0.647	0.067	3.643	0.647	0.067	3.643	8.936	0.931	10.741
	Production Wells		0.472	0.049	0.245	1.416	0.148	17.486	2.360	0.246	285.595	4.248	0.443	303.326
	Exploration Wells													
	Development Wells													
	Total		12.177	1.268	5.260	5.316	0.554	37.965	4.051	0.422	305.469	21.544	2.244	348.695
2027	Pipeline	6.6	2.696	0.408	1.036	2.147	0.325	11.115	0.690	0.105	10.726	5.533	0.838	22.877
	Platforms		3.918	0.594	1.771	0.332	0.050	1.867	0.332	0.050	1.867	4.582	0.694	5.505
	Production Wells		0.236	0.036	0.123	0.708	0.107	8.743	1.180	0.179	142.797	2.124	0.322	151.663
	Exploration Wells													
	Development Wells													
	Total		6.850	1.038	2.930	3.187	0.483	21.725	2.201	0.334	155.391	12.238	1.854	180.046
2028	Pipeline	5.7	2.696	0.473	1.036	2.147	0.377	11.115	0.690	0.121	10.726	5.533	0.971	22.877
	Platforms		3.918	0.687	1.771	0.332	0.058	1.867	0.332	0.058	1.867	4.582	0.804	5.505
	Production Wells		0.236	0.041	0.123	0.708	0.124	8.743	1.180	0.207	142.797	2.124	0.373	151.663
	Exploration Wells													
	Development Wells													
	Total		6.850	1.202	2.930	3.187	0.559	21.725	2.201	0.386	155.391	12.238	2.147	180.046
2029	Pipeline	4.9	2.696	0.550	1.036	2.147	0.438	11.115	0.690	0.141	10.726	5.533	1.129	22.877
	Platforms		3.918	0.800	1.771	0.332	0.068	1.867	0.332	0.068	1.867	4.582	0.935	5.505
	Production Wells		0.236	0.048	0.123	0.708	0.144	8.743	1.180	0.241	142.797	2.124	0.433	151.663
	Exploration Wells													
	Development Wells													
	Total		6.850	1.398	2.930	3.187	0.650	21.725	2.201	0.449	155.391	12.238	2.498	180.046
2030	Pipeline	4.2	1.329	0.316	0.512	1.042	0.248	5.393	0.336	0.080	5.222	2.707	0.644	11.127
	Platforms		3.918	0.933	1.771	0.332	0.079	1.867	0.332	0.079	1.867	4.582	1.091	5.505
	Production Wells		0.236	0.056	0.123	0.708	0.169	8.743	1.180	0.281	142.797	2.124	0.506	151.663
	Exploration Wells													
	Development Wells													
	Total		5.483	1.306	2.405	2.082	0.496	16.003	1.847	0.440	149.887	9.412	2.241	168.295
2031	Pipeline	3.1	1.329	0.369	0.512	1.042	0.289	5.393	0.336	0.093	5.222	2.707	0.752	11.127
	Platforms		3.918	1.088	1.771	0.332	0.092	1.867	0.332	0.092	1.867	4.582	1.273	5.505
	Production Wells		0.236	0.066	0.123	0.708	0.197	8.743	1.180	0.328	142.797	2.124	0.590	151.663
	Exploration Wells													
	Development Wells													
	Total		5.483	1.523	2.405	2.082	0.578	16.003	1.847	0.513	149.887	9.412	2.615	168.295
2032	Pipeline	2.7	1.329	0.429	0.512	1.042	0.336	5.393	0.336	0.108	5.222	2.707	0.873	11.127
	Platforms		3.918	1.264	1.771	0.332	0.107	1.867	0.332	0.107	1.867	4.582	1.478	5.505
	Production Wells		0.236	0.076	0.123	0.708	0.228	8.743	1.180	0.381	142.797	2.124	0.685	151.663
	Exploration Wells													
	Development Wells													
	Total		5.483	1.769	2.405	2.082	0.672	16.003	1.847	0.596	149.887	9.412	3.036	168.295
2033	Pipeline		1.329	0.492	0.512	1.042	0.386	5.393	0.336	0.124	5.222	2.707	1.002	11.127
	Platforms		3.918	1.451	1.771	0.332	0.123	1.867	0.332	0.123	1.867	4.582	1.697	5.505
	Production Wells		0.236	0.087	0.123	0.708	0.262	8.743	1.180	0.437	142.797	2.124	0.787	151.663
	Exploration Wells													
	Development Wells													
	Total		5.483	2.031	2.405	2.082	0.771	16.003	1.847	0.684	149.887	9.412	3.486	168.295
2034	Pipeline													
	Platforms													
	Production Wells													
	Exploration Wells													
	Development Wells													
	Total													
2035	Pipeline													
	Platforms													
	Production Wells													
	Exploration Wells													
	Development Wells													
	Total													
2036	Pipeline													
	Platforms													
	Production Wells													
	Exploration Wells													
	Development Wells													
	Total													
2037	Pipeline													
	Platforms													
	Production Wells													
	Exploration Wells													
	Development Wells													
	Total													
	Pipeline													
	Platforms													

Table 4.1.12
Arctic Spill Occurrence - Sale 1 - Summary

Year	Facility	Production [MMbbl]	Small and Medium Spills 50-999 bbl			Large Spills 1000-9999 bbl			Huge Spills =>10000 bbl			All Spills		
			Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]
2038	Production Wells													
	Exploration Wells													
	Development Wells													
	Total													

Table 4.1.13
Arctic Spill Occurrence - Sale 1 - Annual Summary

Year	Production [MMbbl]	Small and Medium Spills 50-999 bbl			Large Spills 1000-9999 bbl			Huge Spills =>10000 bbl			Significant Spills =>1000 bbl			All Spills		
		Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 103years	Frequency Spills per 109 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]
2004		0.158		0.082	0.476		5.862	0.751		87.639	1.227		93.501	1.386		93.583
2005		0.158		0.082	0.476		5.862	0.751		87.639	1.227		93.501	1.386		93.583
2006		0.255		0.133	0.767		9.443	1.333		165.633	2.099		175.077	2.355		175.209
2007		0.158		0.082	0.476		5.862	0.751		87.639	1.227		93.501	1.386		93.583
2008		0.278		0.144	0.835		10.281	1.440		178.153	2.275		188.434	2.553		188.578
2009		0.697		0.329	0.677		8.072	1.054		119.016	1.731		127.088	2.429		127.417
2010	**7.9**	3.716	0.470	1.603	2.016	0.255	15.760	1.864	0.236	176.356	3.880	0.491	192.116	7.595	0.961	193.719
2011	**15.7**	5.843	0.372	2.566	2.262	0.144	17.613	2.045	0.130	168.936	4.307	0.274	186.548	10.150	0.647	189.114
2012	**23.6**	8.932	0.378	3.876	3.813	0.162	27.908	3.049	0.129	237.298	6.861	0.291	265.206	15.793	0.669	269.082
2013	**31.5**	10.654	0.338	4.661	4.258	0.135	32.481	3.699	0.117	300.156	7.957	0.253	332.637	18.610	0.591	337.298
2014	**28.7**	11.195	0.390	4.908	4.393	0.153	33.865	3.896	0.136	319.026	8.289	0.289	352.891	19.485	0.679	357.798
2015	**39.6**	15.697	0.396	6.767	6.993	0.177	49.593	5.243	0.132	392.650	12.236	0.309	442.242	27.933	0.705	449.010
2016	**43.8**	17.504	0.400	7.591	7.445	0.170	54.206	5.900	0.135	455.547	13.345	0.305	509.753	30.849	0.704	517.344
2017	**40.0**	17.504	0.438	7.591	7.445	0.186	54.206	5.900	0.148	455.547	13.345	0.334	509.753	30.849	0.771	517.344
2018	**36.8**	17.504	0.476	7.591	7.445	0.202	54.206	5.900	0.160	455.547	13.345	0.363	509.753	30.849	0.838	517.344
2019	**34.3**	17.504	0.510	7.591	7.445	0.217	54.206	5.900	0.172	455.547	13.345	0.389	509.753	30.849	0.899	517.344
2020	**29.0**	17.504	0.604	7.591	7.445	0.257	54.206	5.900	0.203	455.547	13.345	0.460	509.753	30.849	1.064	517.344
2021	**24.7**	17.504	0.709	7.591	7.445	0.301	54.206	5.900	0.239	455.547	13.345	0.540	509.753	30.849	1.249	517.344
2022	**20.9**	17.504	0.837	7.591	7.445	0.356	54.206	5.900	0.282	455.547	13.345	0.639	509.753	30.849	1.476	517.344
2023	**17.7**	17.504	0.989	7.591	7.445	0.421	54.206	5.900	0.333	455.547	13.345	0.754	509.753	30.849	1.743	517.344
2024	**15.0**	17.504	1.167	7.591	7.445	0.496	54.206	5.900	0.393	455.547	13.345	0.890	509.753	30.849	2.057	517.344
2025	**11.2**	12.177	1.087	5.260	5.316	0.475	37.965	4.051	0.362	305.469	9.367	0.836	343.434	21.544	1.924	348.695
2026	**9.6**	12.177	1.268	5.260	5.316	0.554	37.965	4.051	0.422	305.469	9.367	0.976	343.434	21.544	2.244	348.695
2027	**6.6**	6.850	1.038	2.930	3.187	0.483	21.725	2.201	0.334	155.391	5.388	0.816	177.116	12.238	1.854	180.046
2028	**5.7**	6.850	1.202	2.930	3.187	0.559	21.725	2.201	0.386	155.391	5.388	0.945	177.116	12.238	2.147	180.046
2029	**4.9**	6.850	1.398	2.930	3.187	0.650	21.725	2.201	0.449	155.391	5.388	1.100	177.116	12.238	2.498	180.046
2030	**4.2**	5.483	1.306	2.405	2.082	0.496	16.003	1.847	0.440	149.887	3.929	0.935	165.890	9.412	2.241	168.295
2031	**3.6**	5.483	1.523	2.405	2.082	0.578	16.003	1.847	0.513	149.887	3.929	1.091	165.890	9.412	2.615	168.295
2032	**3.1**	5.483	1.769	2.405	2.082	0.672	16.003	1.847	0.596	149.887	3.929	1.267	165.890	9.412	3.036	168.295
2033	**2.7**	5.483	2.031	2.405	2.082	0.771	16.003	1.847	0.684	149.887	3.929	1.455	165.890	9.412	3.486	168.295
2034																
2035																
2036																
2037																
2038																
Total LOF	**460.8**	**282.111**		**122**	**122.966**		**916**	**101.073**		**8097**	**224.039**		**9012**	**506.150**		**9135**
Average LOF		**9.404**	**0.612**	**4**	**4.099**	**0.267**	**31**	**3.369**	**0.219**	**270**	**7.468**	**0.486**	**300**	**16.872**	**1.098**	**304**

Table 4.1.14
Sale 1 - Year 2016 - Monte Carlo Results

SALE 1 Year 2016	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills
	Frequency Spills per 10^3years					Frequency Spills per 10^9 bbl Produced					Spill Index [bbl]				
Mean =	17.50	7.45	5.90	13.35	30.85	0.40	0.17	0.13	0.30	0.70	7.58	54.14	453.92	508.06	515.64
Std Deviation =	6.85	2.38	1.38	3.12	7.58	0.16	0.05	0.03	0.07	0.17	5.09	25.33	166.83	168.75	168.83
Variance =	46.991	5.654	1.903	9.706	57.430	0.024	0.003	0.001	0.005	0.030	25.875	641.728	27830.730	28477.370	28504.210
Skewness =	0.57	0.49	0.18	0.25	0.45	0.57	0.49	0.18	0.25	0.45	1.51	0.75	0.47	0.47	0.47
Kurtosis =	2.81	2.93	2.83	2.90	2.82	2.81	2.93	2.83	2.90	2.82	5.90	3.49	3.15	3.18	3.17
Mode =	14.87	6.40	6.33	11.98	33.42	0.61	0.15	0.16	0.27	0.76	3.99	38.10	336.73	403.87	238.43
Minimum =	3.665	1.394	2.076	4.074	12.206	0.084	0.032	0.047	0.093	0.279	0.048	-5.653	57.627	89.063	100.160
5% Perc =	8.076	3.992	3.705	8.488	19.551	0.184	0.091	0.085	0.194	0.446	1.930	19.473	203.555	254.737	261.714
10% Perc =	9.265	4.598	4.127	9.457	21.641	0.212	0.105	0.094	0.216	0.494	2.578	24.401	247.551	300.820	308.648
15% Perc =	10.270	5.022	4.439	10.087	22.946	0.234	0.115	0.101	0.230	0.524	3.060	28.576	280.502	332.078	339.452
20% Perc =	11.235	5.354	4.707	10.666	24.124	0.257	0.122	0.107	0.244	0.551	3.527	31.871	309.260	359.667	367.135
25% Perc =	12.128	5.670	4.941	11.157	25.226	0.277	0.129	0.113	0.255	0.576	3.959	35.321	334.223	386.799	393.868
30% Perc =	12.989	5.971	5.116	11.576	26.248	0.297	0.136	0.117	0.264	0.599	4.390	38.345	355.170	410.086	418.341
35% Perc =	13.921	6.282	5.311	11.995	27.182	0.318	0.143	0.121	0.274	0.621	4.842	41.377	378.285	431.522	439.141
40% Perc =	14.716	6.555	5.506	12.425	28.082	0.336	0.150	0.126	0.284	0.641	5.303	44.483	400.053	452.817	460.282
45% Perc =	15.575	6.863	5.681	12.802	28.931	0.356	0.157	0.130	0.292	0.661	5.786	47.460	420.241	475.868	483.356
50% Perc =	16.524	7.166	5.858	13.237	29.860	0.377	0.164	0.134	0.302	0.682	6.233	50.572	440.511	495.134	503.779
55% Perc =	17.509	7.483	6.045	13.634	31.058	0.400	0.171	0.138	0.311	0.709	6.822	53.834	460.705	516.303	524.229
60% Perc =	18.530	7.825	6.241	13.987	32.172	0.423	0.179	0.142	0.319	0.735	7.465	57.228	482.578	537.060	545.385
65% Perc =	19.589	8.174	6.404	14.414	33.330	0.447	0.187	0.146	0.329	0.761	8.144	60.767	505.826	561.518	568.816
70% Perc =	20.739	8.559	6.598	14.840	34.578	0.473	0.195	0.151	0.339	0.789	8.864	65.029	532.804	587.964	596.134
75% Perc =	22.154	9.023	6.828	15.352	35.978	0.506	0.206	0.156	0.350	0.821	9.854	69.273	559.280	615.176	621.757
80% Perc =	23.441	9.480	7.073	15.948	37.394	0.535	0.216	0.161	0.364	0.854	10.915	74.410	591.103	646.552	653.645
85% Perc =	24.998	10.051	7.342	16.611	39.225	0.571	0.229	0.168	0.379	0.896	12.365	80.256	628.854	685.742	693.119
90% Perc =	27.201	10.754	7.710	17.483	41.113	0.621	0.246	0.176	0.399	0.939	14.407	88.387	676.355	732.058	740.066
95% Perc =	30.205	11.653	8.247	18.771	44.481	0.690	0.266	0.188	0.429	1.016	17.787	102.136	746.994	804.537	811.342
Maximum =	45.353	17.402	10.734	24.254	58.144	1.035	0.397	0.245	0.554	1.327	34.668	159.414	1141.096	1187.318	1190.433

Table 4.1.15
Sale 1 LOF Average - Pipeline - Monte Carlo Results

SALE 1 Pipeline	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills
All years Average LOF	**Frequency Spills per 10^3years**					**Frequency Spills per 10^9 bbl Produced**					**Spill Index [bbl]**				
Mean =	2.89	2.32	0.74	3.06	5.95	0.19	0.15	0.05	0.20	0.39	1.11	12.04	11.56	23.60	24.71
Std Deviation =	1.19	1.13	0.38	1.19	1.69	0.08	0.07	0.02	0.08	0.11	0.83	9.24	6.42	11.16	11.19
Variance =	1.413	1.283	0.143	1.413	2.866	0.006	0.005	0.001	0.006	0.012	0.690	85.420	41.245	124.542	125.229
Skewness =	0.54	0.64	0.73	0.55	0.43	0.54	0.64	0.73	0.55	0.43	1.40	1.39	0.99	0.90	0.90
Kurtosis =	2.78	2.85	3.14	2.84	2.98	2.78	2.85	3.14	2.84	2.98	5.26	5.50	4.07	4.05	4.04
Mode =	1.76	1.52	0.43	2.66	5.30	0.20	0.10	0.03	0.17	0.34	0.61	5.57	16.54	18.06	20.20
Minimum =	0.484	0.212	0.069	0.544	1.575	0.032	0.014	0.004	0.035	0.103	-0.138	-2.046	1.054	2.320	2.646
5% Perc =	1.220	0.781	0.246	1.397	3.412	0.079	0.051	0.016	0.091	0.222	0.179	1.595	3.456	8.628	9.681
10% Perc =	1.453	0.974	0.306	1.633	3.866	0.095	0.063	0.020	0.106	0.252	0.267	2.679	4.424	10.979	12.026
15% Perc =	1.651	1.143	0.354	1.805	4.166	0.107	0.074	0.023	0.118	0.271	0.353	3.576	5.273	12.514	13.598
20% Perc =	1.816	1.268	0.397	1.977	4.429	0.118	0.083	0.026	0.129	0.288	0.428	4.413	5.877	14.058	15.107
25% Perc =	1.976	1.420	0.438	2.143	4.693	0.129	0.092	0.029	0.140	0.306	0.505	5.294	6.615	15.368	16.470
30% Perc =	2.127	1.561	0.482	2.297	4.920	0.138	0.102	0.031	0.150	0.320	0.575	6.208	7.321	16.653	17.830
35% Perc =	2.265	1.693	0.530	2.455	5.157	0.147	0.110	0.034	0.160	0.336	0.642	7.041	8.039	17.966	18.952
40% Perc =	2.419	1.842	0.581	2.591	5.387	0.158	0.120	0.038	0.169	0.351	0.725	7.806	8.780	19.194	20.286
45% Perc =	2.572	1.997	0.635	2.743	5.612	0.167	0.130	0.041	0.179	0.365	0.807	8.725	9.568	20.579	21.621
50% Perc =	2.725	2.153	0.685	2.909	5.820	0.177	0.140	0.045	0.189	0.379	0.889	9.601	10.404	21.785	22.938
55% Perc =	2.888	2.282	0.736	3.077	6.066	0.188	0.149	0.048	0.200	0.395	0.989	10.692	11.146	23.140	24.329
60% Perc =	3.075	2.448	0.793	3.255	6.292	0.200	0.159	0.052	0.212	0.410	1.101	11.755	12.020	24.605	25.715
65% Perc =	3.273	2.651	0.858	3.427	6.522	0.213	0.173	0.056	0.223	0.425	1.211	13.246	13.012	26.288	27.302
70% Perc =	3.474	2.836	0.918	3.610	6.762	0.226	0.185	0.060	0.235	0.440	1.331	14.767	14.039	28.016	29.081
75% Perc =	3.672	3.047	0.980	3.837	7.038	0.239	0.198	0.064	0.250	0.458	1.491	16.541	15.186	29.928	30.984
80% Perc =	3.926	3.289	1.061	4.058	7.340	0.256	0.214	0.069	0.264	0.478	1.666	18.540	16.610	32.156	33.193
85% Perc =	4.178	3.566	1.153	4.354	7.727	0.272	0.232	0.075	0.283	0.503	1.908	21.092	18.325	35.193	36.291
90% Perc =	4.577	3.952	1.269	4.740	8.244	0.298	0.257	0.083	0.309	0.537	2.249	24.810	20.580	38.901	40.083
95% Perc =	5.124	4.455	1.443	5.267	8.978	0.334	0.290	0.094	0.343	0.585	2.828	30.924	23.684	44.755	45.986
Maximum =	7.355	6.231	2.298	7.539	12.502	0.479	0.406	0.150	0.491	0.814	5.696	74.104	43.587	83.225	84.404

Table 4.1.16
Sale 1 LOF Average - Platforms - Monte Carlo Results

SALE 1 Platforms	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills
All years Average LOF	**Frequency Spills per 10^3years**					**Frequency Spills per 10^9 bbl Produced**					**Spill Index [bbl]**				
Mean =	6.10	0.52	0.52	1.03	7.14	0.40	0.03	0.03	0.07	0.46	2.74	2.91	2.91	5.82	8.56
Std Deviation =	3.51	0.31	0.31	0.61	3.57	0.23	0.02	0.02	0.04	0.23	2.58	2.38	2.38	4.75	5.39
Variance =	12.333	0.094	0.094	0.375	12.715	0.052	0.000	0.000	0.002	0.054	6.680	5.651	5.651	22.604	29.106
Skewness =	0.69	0.66	0.66	0.66	0.66	0.69	0.66	0.66	0.66	0.66	1.65	1.33	1.33	1.33	1.03
Kurtosis =	2.76	2.72	2.72	2.72	2.77	2.76	2.72	2.72	2.72	2.77	6.06	5.01	5.01	5.01	4.08
Mode =	2.69	0.20	0.20	0.39	6.27	0.50	0.01	0.01	0.03	0.51	0.71	1.03	1.03	2.06	3.30
Minimum =	0.741	0.025	0.025	0.049	1.108	0.048	0.002	0.002	0.003	0.072	-0.967	-1.196	-1.196	-2.392	-1.317
5% Perc =	1.620	0.123	0.123	0.247	2.441	0.105	0.008	0.008	0.016	0.159	0.193	0.292	0.292	0.584	1.882
10% Perc =	2.016	0.160	0.160	0.321	2.981	0.131	0.010	0.010	0.021	0.194	0.383	0.538	0.538	1.076	2.756
15% Perc =	2.410	0.194	0.194	0.388	3.433	0.157	0.013	0.013	0.025	0.224	0.558	0.740	0.740	1.481	3.341
20% Perc =	2.811	0.229	0.229	0.459	3.824	0.183	0.015	0.015	0.030	0.249	0.727	0.936	0.936	1.872	3.941
25% Perc =	3.209	0.261	0.261	0.522	4.254	0.209	0.017	0.017	0.034	0.277	0.911	1.128	1.128	2.255	4.451
30% Perc =	3.603	0.300	0.300	0.599	4.685	0.235	0.020	0.020	0.039	0.305	1.084	1.320	1.320	2.640	5.003
35% Perc =	4.054	0.339	0.339	0.678	5.092	0.264	0.022	0.022	0.044	0.332	1.268	1.544	1.544	3.087	5.566
40% Perc =	4.483	0.374	0.374	0.748	5.546	0.292	0.024	0.024	0.049	0.361	1.471	1.762	1.762	3.524	6.100
45% Perc =	4.969	0.420	0.420	0.840	6.027	0.324	0.027	0.027	0.055	0.392	1.670	1.991	1.991	3.982	6.687
50% Perc =	5.453	0.462	0.462	0.924	6.505	0.355	0.030	0.030	0.060	0.424	1.890	2.263	2.263	4.525	7.373
55% Perc =	6.017	0.506	0.506	1.012	7.052	0.392	0.033	0.033	0.066	0.459	2.196	2.543	2.543	5.085	8.174
60% Perc =	6.549	0.553	0.553	1.107	7.588	0.427	0.036	0.036	0.072	0.494	2.495	2.899	2.899	5.798	8.925
65% Perc =	7.120	0.602	0.602	1.204	8.118	0.464	0.039	0.039	0.078	0.528	2.877	3.254	3.254	6.509	9.743
70% Perc =	7.696	0.658	0.658	1.316	8.774	0.501	0.043	0.043	0.086	0.572	3.293	3.660	3.660	7.321	10.591
75% Perc =	8.392	0.721	0.721	1.442	9.504	0.546	0.047	0.047	0.094	0.619	3.770	4.109	4.109	8.218	11.583
80% Perc =	9.290	0.795	0.795	1.590	10.361	0.605	0.052	0.052	0.104	0.675	4.351	4.610	4.610	9.220	12.837
85% Perc =	10.147	0.880	0.880	1.760	11.267	0.661	0.057	0.057	0.115	0.734	5.163	5.356	5.356	10.713	14.102
90% Perc =	11.300	0.962	0.962	1.923	12.286	0.736	0.063	0.063	0.125	0.800	6.386	6.179	6.179	12.358	16.157
95% Perc =	12.726	1.088	1.088	2.176	13.709	0.829	0.071	0.071	0.142	0.893	8.217	7.745	7.745	15.489	19.269
Maximum =	18.185	1.608	1.608	3.216	19.682	1.184	0.105	0.105	0.209	1.281	17.879	15.604	15.604	31.208	39.573

Table 4.1.17
Sale 1 LOF Average - Wells - Monte Carlo Results

SALE 1 Wells	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills
All years Average LOF	**Frequency Spills per 10^3years**					**Frequency Spills per 10^9 bbl Produced**					**Spill Index [bbl]**				
Mean =	0.42	1.27	2.11	3.37	3.80	0.03	0.08	0.14	0.22	0.25	0.22	15.63	255.27	270.90	271.12
Std Deviation =	0.15	0.46	0.56	0.98	1.00	0.01	0.03	0.04	0.06	0.06	0.15	10.30	96.12	96.65	96.65
Variance =	0.024	0.216	0.314	0.964	0.991	0.000	0.001	0.001	0.004	0.004	0.023	106.036	9239.903	9341.099	9341.020
Skewness =	-0.01	-0.02	-0.04	-0.03	-0.04	-0.01	-0.02	-0.04	-0.03	-0.04	0.78	0.86	0.47	0.46	0.46
Kurtosis =	2.42	2.42	2.69	2.56	2.57	2.42	2.42	2.69	2.56	2.57	3.51	3.56	3.10	3.09	3.09
Mode =	0.36	0.65	2.09	3.63	3.01	0.03	0.04	0.14	0.24	0.25	0.18	16.52	242.89	190.96	343.87
Minimum =	0.028	0.077	0.383	0.507	0.984	0.002	0.005	0.025	0.033	0.064	-0.095	-3.819	41.761	53.975	54.015
5% Perc =	0.162	0.482	1.167	1.714	2.129	0.011	0.031	0.076	0.112	0.139	0.015	2.226	110.616	125.647	125.785
10% Perc =	0.216	0.636	1.379	2.060	2.469	0.014	0.041	0.090	0.134	0.161	0.044	3.873	136.781	152.195	152.448
15% Perc =	0.250	0.748	1.514	2.314	2.721	0.016	0.049	0.099	0.151	0.177	0.067	5.233	156.179	170.473	170.891
20% Perc =	0.281	0.849	1.616	2.509	2.917	0.018	0.055	0.105	0.163	0.190	0.087	6.538	171.598	187.357	187.583
25% Perc =	0.310	0.934	1.725	2.678	3.096	0.020	0.061	0.112	0.174	0.202	0.106	7.808	185.147	200.332	200.538
30% Perc =	0.339	1.008	1.804	2.833	3.259	0.022	0.066	0.117	0.184	0.212	0.125	9.069	198.717	213.926	214.246
35% Perc =	0.361	1.082	1.885	2.991	3.405	0.023	0.070	0.123	0.195	0.222	0.144	10.274	210.569	226.229	226.482
40% Perc =	0.381	1.145	1.961	3.135	3.550	0.025	0.075	0.128	0.204	0.231	0.161	11.384	222.188	237.965	238.160
45% Perc =	0.402	1.208	2.051	3.263	3.684	0.026	0.079	0.134	0.212	0.240	0.178	12.639	234.416	249.160	249.368
50% Perc =	0.423	1.273	2.122	3.387	3.807	0.028	0.083	0.138	0.220	0.248	0.196	13.879	246.073	262.235	262.380
55% Perc =	0.442	1.330	2.190	3.522	3.937	0.029	0.087	0.143	0.229	0.256	0.215	15.143	258.431	275.129	275.270
60% Perc =	0.462	1.386	2.267	3.644	4.067	0.030	0.090	0.148	0.237	0.265	0.235	16.445	271.699	288.675	289.030
65% Perc =	0.484	1.460	2.337	3.771	4.204	0.032	0.095	0.152	0.246	0.274	0.257	17.911	286.374	301.737	302.148
70% Perc =	0.506	1.524	2.411	3.905	4.353	0.033	0.099	0.157	0.254	0.283	0.281	19.791	300.686	316.510	316.828
75% Perc =	0.534	1.596	2.503	4.059	4.503	0.035	0.104	0.163	0.264	0.293	0.306	21.664	317.191	334.168	334.427
80% Perc =	0.560	1.676	2.588	4.240	4.674	0.036	0.109	0.168	0.276	0.304	0.338	23.793	337.216	352.014	352.424
85% Perc =	0.592	1.777	2.701	4.429	4.865	0.039	0.116	0.176	0.288	0.317	0.374	26.567	358.408	373.061	373.224
90% Perc =	0.630	1.887	2.837	4.679	5.099	0.041	0.123	0.185	0.305	0.332	0.428	30.171	382.651	399.223	399.464
95% Perc =	0.680	2.042	3.022	5.014	5.450	0.044	0.133	0.197	0.326	0.355	0.506	35.431	425.776	440.142	440.330
Maximum =	0.822	2.450	3.954	6.291	6.645	0.053	0.159	0.257	0.410	0.433	0.846	60.821	653.032	680.398	680.634

Table 4.1.18
Sale 1 LOF Average Platforms + Wells - Monte Carlo Results

SALE 1 Platforms + Wells	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills
All years Average LOF	**Frequency Spills per 10^3years**					**Frequency Spills per 10^9 bbl Produced**					**Spill Index [bbl]**				
Mean =	6.53	1.78	2.63	4.41	10.93	0.42	0.12	0.17	0.29	0.71	2.96	18.54	258.18	276.73	279.69
Std Deviation =	3.51	0.56	0.64	1.16	3.68	0.23	0.04	0.04	0.08	0.24	2.59	10.56	96.14	96.74	96.85
Variance =	12.332	0.313	0.408	1.347	13.556	0.052	0.001	0.002	0.006	0.057	6.701	111.562	9242.884	9358.111	9379.971
Skewness =	0.68	0.11	0.03	0.07	0.58	0.68	0.11	0.03	0.07	0.58	1.64	0.81	0.47	0.46	0.46
Kurtosis =	2.77	2.76	2.85	2.80	2.77	2.77	2.76	2.85	2.80	2.77	6.03	3.48	3.10	3.09	3.10
Mode =	2.56	1.70	2.27	4.30	8.52	0.17	0.11	0.15	0.28	0.55	0.66	11.24	293.01	292.78	356.26
Minimum =	1.061	0.200	0.660	0.898	3.203	0.069	0.013	0.043	0.058	0.209	-0.790	-2.817	44.156	57.964	59.402
5% Perc =	2.001	0.865	1.562	2.490	5.914	0.130	0.056	0.102	0.162	0.385	0.390	4.302	113.417	131.402	134.315
10% Perc =	2.445	1.056	1.784	2.888	6.606	0.159	0.069	0.116	0.188	0.430	0.604	6.408	139.917	157.681	160.555
15% Perc =	2.829	1.182	1.955	3.197	7.162	0.184	0.077	0.127	0.208	0.466	0.781	7.948	159.166	176.681	180.024
20% Perc =	3.237	1.291	2.083	3.405	7.595	0.211	0.084	0.136	0.222	0.494	0.942	9.385	174.945	193.354	195.845
25% Perc =	3.640	1.393	2.193	3.611	8.034	0.237	0.091	0.143	0.235	0.523	1.132	10.666	188.551	206.251	208.835
30% Perc =	4.035	1.473	2.289	3.784	8.482	0.263	0.096	0.149	0.246	0.552	1.301	11.839	201.681	219.260	222.649
35% Perc =	4.458	1.555	2.377	3.945	8.910	0.290	0.101	0.155	0.257	0.580	1.482	13.118	213.591	232.404	234.895
40% Perc =	4.908	1.632	2.460	4.099	9.387	0.320	0.106	0.160	0.267	0.611	1.695	14.311	225.041	244.154	247.357
45% Perc =	5.352	1.705	2.546	4.257	9.910	0.348	0.111	0.166	0.277	0.645	1.899	15.512	237.606	255.932	258.936
50% Perc =	5.882	1.776	2.629	4.398	10.343	0.383	0.116	0.171	0.286	0.673	2.125	16.645	249.316	268.273	271.174
55% Perc =	6.436	1.840	2.701	4.543	10.861	0.419	0.120	0.176	0.296	0.707	2.419	18.095	261.422	281.319	284.206
60% Perc =	6.965	1.913	2.783	4.692	11.428	0.453	0.125	0.181	0.305	0.744	2.721	19.556	274.938	293.742	296.373
65% Perc =	7.542	1.991	2.872	4.838	12.009	0.491	0.130	0.187	0.315	0.782	3.101	21.061	289.622	308.528	311.483
70% Perc =	8.139	2.075	2.959	5.019	12.646	0.530	0.135	0.193	0.327	0.823	3.525	22.928	303.443	322.442	324.900
75% Perc =	8.818	2.173	3.052	5.202	13.434	0.574	0.142	0.199	0.339	0.875	3.981	24.781	319.843	339.454	342.243
80% Perc =	9.694	2.264	3.171	5.393	14.184	0.631	0.147	0.206	0.351	0.923	4.566	26.851	339.879	358.233	361.317
85% Perc =	10.589	2.365	3.295	5.645	15.147	0.689	0.154	0.215	0.367	0.986	5.393	29.702	360.325	378.375	381.642
90% Perc =	11.693	2.505	3.453	5.920	16.130	0.761	0.163	0.225	0.385	1.050	6.617	33.319	385.462	405.189	408.080
95% Perc =	13.088	2.715	3.685	6.331	17.712	0.852	0.177	0.240	0.412	1.153	8.428	38.700	428.144	445.477	447.962
Maximum =	18.723	3.699	4.700	8.393	23.330	1.219	0.241	0.306	0.546	1.519	18.081	64.661	658.126	686.393	686.953

Table 4.1.19
Sale 1 LOF Average - Monte Carlo Results

SALE 1	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills
All years Average LOF	**Frequency Spills per 10^3years**					**Frequency Spills per 10^9 bbl Produced**					**Spill Index [bbl]**				
Mean =	9.42	4.10	3.37	7.47	16.88	0.61	0.27	0.22	0.49	1.10	4.07	30.58	269.75	300.33	304.39
Std Deviation =	3.71	1.26	0.74	1.66	4.02	0.24	0.08	0.05	0.11	0.26	2.71	14.27	96.29	97.32	97.42
Variance =	13.755	1.598	0.551	2.752	16.195	0.058	0.007	0.002	0.012	0.069	7.351	203.624	9270.889	9471.882	9491.287
Skewness =	0.62	0.49	0.15	0.23	0.50	0.62	0.49	0.15	0.23	0.50	1.43	0.79	0.47	0.45	0.46
Kurtosis =	2.93	2.97	3.02	2.96	2.99	2.93	2.97	3.02	2.96	2.99	5.36	3.75	3.10	3.07	3.07
Mode =	6.24	4.18	3.04	7.27	9.60	0.41	0.26	0.20	0.47	0.63	2.91	30.22	176.97	274.29	296.88
Minimum =	2.438	0.897	1.065	2.767	6.894	0.159	0.058	0.069	0.180	0.449	-0.030	0.686	51.554	66.082	76.293
5% Perc =	4.257	2.250	2.205	4.814	11.020	0.277	0.146	0.144	0.313	0.717	1.050	11.069	125.536	153.613	157.600
10% Perc =	5.036	2.560	2.429	5.345	12.033	0.328	0.167	0.158	0.348	0.783	1.382	14.090	151.688	180.447	185.017
15% Perc =	5.616	2.783	2.605	5.774	12.796	0.366	0.181	0.170	0.376	0.833	1.643	16.384	170.524	200.276	204.123
20% Perc =	6.064	2.987	2.734	6.047	13.333	0.395	0.194	0.178	0.394	0.868	1.893	18.364	185.973	215.030	219.023
25% Perc =	6.525	3.169	2.860	6.312	13.862	0.425	0.206	0.186	0.411	0.902	2.127	20.216	198.805	229.007	233.042
30% Perc =	7.000	3.339	2.967	6.543	14.429	0.456	0.217	0.193	0.426	0.939	2.365	21.983	213.362	242.078	246.534
35% Perc =	7.417	3.488	3.058	6.791	14.913	0.483	0.227	0.199	0.442	0.971	2.600	23.449	225.250	255.236	258.741
40% Perc =	7.868	3.637	3.150	6.979	15.434	0.512	0.237	0.205	0.454	1.005	2.833	24.967	237.045	266.565	270.678
45% Perc =	8.368	3.806	3.246	7.191	15.934	0.545	0.248	0.211	0.468	1.037	3.069	26.909	248.930	279.020	283.277
50% Perc =	8.869	3.962	3.346	7.386	16.416	0.577	0.258	0.218	0.481	1.069	3.334	28.606	260.543	291.487	295.196
55% Perc =	9.391	4.126	3.448	7.586	16.956	0.611	0.269	0.224	0.494	1.104	3.656	30.354	273.588	304.090	308.307
60% Perc =	9.910	4.293	3.552	7.807	17.494	0.645	0.279	0.231	0.508	1.139	4.017	32.060	286.658	318.610	322.242
65% Perc =	10.444	4.483	3.650	8.040	18.121	0.680	0.292	0.238	0.523	1.180	4.340	33.965	301.727	333.330	337.625
70% Perc =	11.126	4.676	3.758	8.282	18.828	0.724	0.304	0.245	0.539	1.226	4.760	36.192	315.901	347.516	351.618
75% Perc =	11.894	4.926	3.861	8.558	19.551	0.774	0.321	0.251	0.557	1.273	5.234	38.685	330.588	364.225	368.446
80% Perc =	12.686	5.155	4.001	8.881	20.369	0.826	0.336	0.260	0.578	1.326	5.870	41.720	350.769	381.430	385.621
85% Perc =	13.524	5.465	4.142	9.218	21.336	0.880	0.356	0.270	0.600	1.389	6.675	45.670	370.763	402.510	406.443
90% Perc =	14.604	5.825	4.326	9.662	22.363	0.951	0.379	0.282	0.629	1.456	7.852	50.154	396.432	429.853	433.978
95% Perc =	16.255	6.394	4.598	10.301	24.015	1.058	0.416	0.299	0.671	1.563	9.742	57.157	440.181	471.883	475.920
Maximum =	22.719	8.834	6.372	13.408	33.808	1.479	0.575	0.415	0.873	2.201	19.075	101.992	668.221	703.705	707.586

Table 4.1.20
Composition of Spill Indicators - Sale 1 - Year 2016

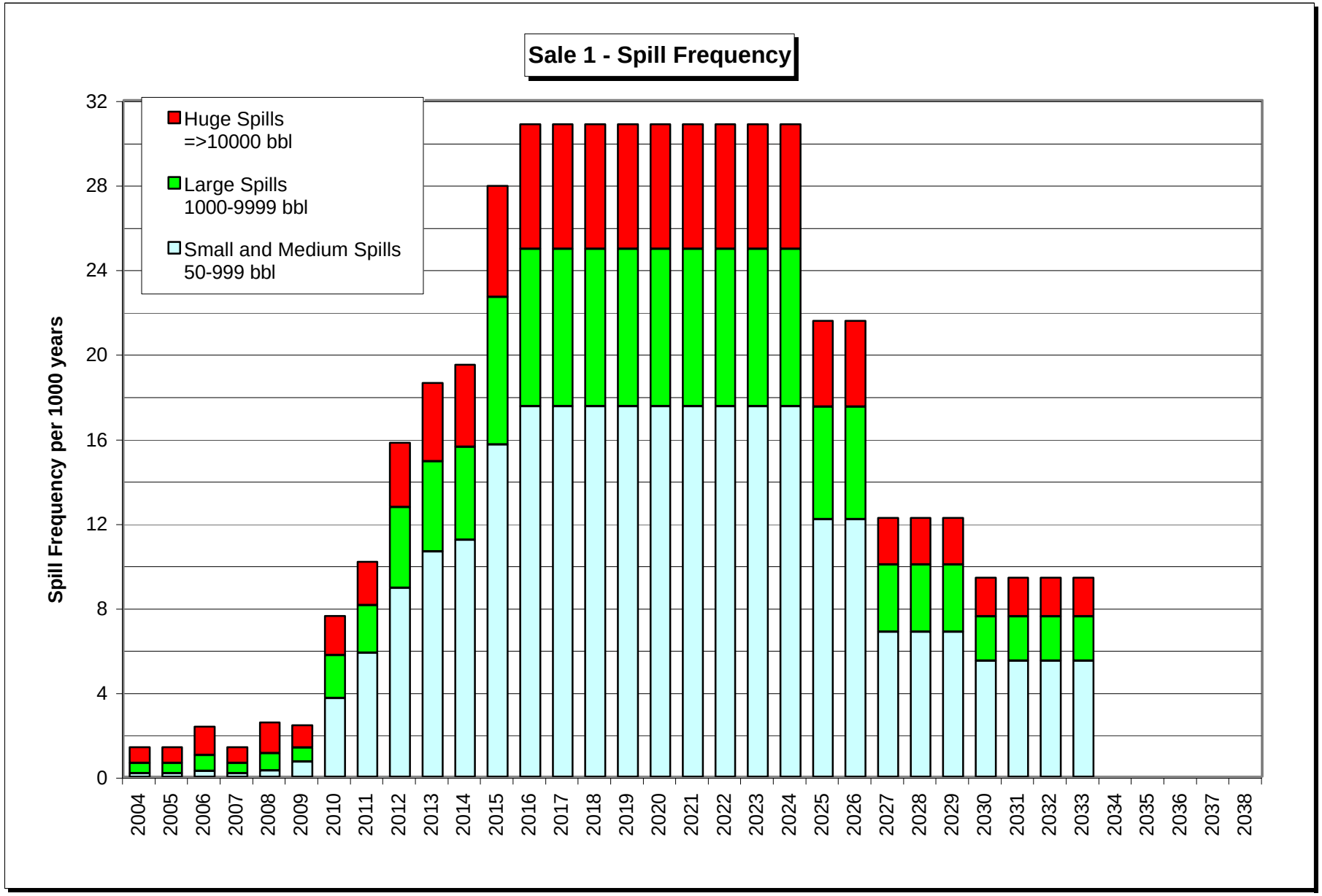
Spill Size	Spill Source									
	P/L		Platforms		Wells		Platforms and Wells		All	
	Sale 1 - Year 2016 Spill Frequency per 10^3 years									
Small and Medium Spills 50-999 bbl	5.429	49%	11.366	86%	0.708	11%	12.074	61%	17.504	57%
Large Spills 1000-9999 bbl	4.358	39%	0.962	7%	2.124	33%	3.087	16%	7.445	24%
Huge Spills =>10000 bbl	1.398	12%	0.962	7%	3.540	56%	4.503	23%	5.900	19%
Significant Spills =>1000 bbl	5.756	51%	1.925	14%	5.664	89%	7.589	39%	13.345	43%
All Spills	**11.185**	**100%**	**13.291**	**100%**	**6.372**	**100%**	**19.664**	**100%**	**30.849**	**100%**
	Sale 1 - Lyear 2016 Spill Frequency per 10^9 bbl produced									
Small and Medium Spills 50-999 bbl	0.124	49%	0.260	86%	0.016	11%	0.276	61%	0.400	57%
Large Spills 1000-9999 bbl	0.100	39%	0.022	7%	0.048	33%	0.070	16%	0.170	24%
Huge Spills =>10000 bbl	0.032	12%	0.022	7%	0.081	56%	0.103	23%	0.135	19%
Significant Spills =>1000 bbl	0.131	51%	0.044	14%	0.129	89%	0.173	39%	0.305	43%
All Spills	**0.255**	**100%**	**0.303**	**100%**	**0.145**	**100%**	**0.449**	**100%**	**0.704**	**100%**
	Sale 1 - Year 2016 Spill Index [bbl]									
Small and Medium Spills 50-999 bbl	2	4%	5	32%	0	0%	6	1%	8	1%
Large Spills 1000-9999 bbl	23	49%	5	34%	26	6%	32	7%	54	10%
Huge Spills =>10000 bbl	22	47%	5	34%	428	94%	434	92%	456	88%
Significant Spills =>1000 bbl	44	96%	11	68%	455	100%	465	99%	510	99%
All Spills	**46**	**100%**	**16**	**100%**	**455**	**100%**	**471**	**100%**	**517**	**100%**

Spill Source	Spill Size									
	S+M 50-999 bbl		Large 1000-9999 bbl		Huge =>10000 bbl		Significant =>1000 bbl		All Spills	
	Sale 1 - Year 2016 Spill Frequency per 10^3 years									
P/L	5.429	31%	4.358	59%	1.398	24%	5.756	43%	11.185	36%
Platforms	11.366	65%	0.962	13%	0.962	16%	1.925	14%	13.291	43%
Wells	0.708	4%	2.124	29%	3.540	60%	5.664	42%	6.372	21%
Platforms and Wells	12.074	69%	3.087	41%	4.503	76%	7.589	57%	19.664	64%
All	**17.504**	**100%**	**7.445**	**100%**	**5.900**	**100%**	**13.345**	**100%**	**30.849**	**100%**
	Sale 1 - Year 2016 Spill Frequency per 10^9 bbl produced									
P/L	0.124	31%	0.100	59%	0.032	24%	0.131	43%	0.255	36%
Platforms	0.260	65%	0.022	13%	0.022	16%	0.044	14%	0.303	43%
Wells	0.016	4%	0.048	29%	0.081	60%	0.129	42%	0.145	21%
Platforms and Wells	0.276	69%	0.070	41%	0.103	76%	0.173	57%	0.449	64%
All	**0.400**	**100%**	**0.170**	**100%**	**0.135**	**100%**	**0.305**	**100%**	**0.704**	**100%**
	Sale 1 - Year 2016 Spill Index [bbl]									
P/L	2	27%	23	42%	22	5%	44	9%	46	9%
Platforms	5	68%	5	10%	5	1%	11	2%	16	3%
Wells	0	5%	26	48%	428	94%	455	89%	455	88%
Platforms and Wells	6	73%	32	58%	434	95%	465	91%	471	91%
All	**8**	**100%**	**54**	**100%**	**456**	**100%**	**510**	**100%**	**517**	**100%**

Table 4.1.21
Composition of Spill Indicators - Sale 1 - LOF Average

Spill Size	Spill Source									
	P/L		Platforms		Wells		Platforms and Wells		All	
	Sale 1 - LOF Average Spill Frequency per 10^3 years									
Small and Medium Spills 50-999 bbl	2.892	49%	6.090	86%	0.422	11%	6.512	60%	9.404	56%
Large Spills 1000-9999 bbl	2.318	39%	0.516	7%	1.265	33%	1.781	16%	4.099	24%
Huge Spills =>10000 bbl	0.744	12%	0.516	7%	2.110	56%	2.626	24%	3.369	20%
Significant Spills =>1000 bbl	3.062	51%	1.031	14%	3.375	89%	4.406	40%	7.468	44%
All Spills	**5.953**	**100%**	**7.122**	**100%**	**3.797**	**100%**	**10.918**	**100%**	**16.872**	**100%**
	Sale 1 - LOF Average Spill Frequency per 10^9 bbl produced									
Small and Medium Spills 50-999 bbl	0.188	49%	0.397	86%	0.027	11%	0.424	60%	0.612	56%
Large Spills 1000-9999 bbl	0.151	39%	0.034	7%	0.082	33%	0.116	16%	0.267	24%
Huge Spills =>10000 bbl	0.048	12%	0.034	7%	0.137	56%	0.171	24%	0.219	20%
Significant Spills =>1000 bbl	0.199	51%	0.067	14%	0.220	89%	0.287	40%	0.486	44%
All Spills	**0.388**	**100%**	**0.464**	**100%**	**0.247**	**100%**	**0.711**	**100%**	**1.098**	**100%**
	Sale 1 - LOF Average Spill Index [bbl]									
Small and Medium Spills 50-999 bbl	1	5%	3	32%	0	0%	3	1%	4	1%
Large Spills 1000-9999 bbl	12	49%	3	34%	16	6%	19	7%	31	10%
Huge Spills =>10000 bbl	12	47%	3	34%	255	94%	258	92%	270	89%
Significant Spills =>1000 bbl	24	95%	6	68%	271	100%	277	99%	300	99%
All Spills	**25**	**100%**	**9**	**100%**	**271**	**100%**	**280**	**100%**	**304**	**100%**

Spill Source	Spill Size									
	S+M 50-999 bbl		Large 1000-9999 bbl		Huge =>10000 bbl		Significant =>1000 bbl		All Spills	
	Sale 1 - LOF Average Spill Frequency per 10^3 years									
P/L	2.892	31%	2.318	57%	0.744	22%	3.062	41%	5.953	35%
Platforms	6.090	65%	0.516	13%	0.516	15%	1.031	14%	7.122	42%
Wells	0.422	4%	1.265	31%	2.110	63%	3.375	45%	3.797	23%
Platforms and Wells	6.512	69%	1.781	43%	2.626	78%	4.406	59%	10.918	65%
All	**9.404**	**100%**	**4.099**	**100%**	**3.369**	**100%**	**7.468**	**100%**	**16.872**	**100%**
	Sale 1 - LOF Average Spill Frequency per 10^9 bbl produced									
P/L	0.188	31%	0.151	57%	0.048	22%	0.199	41%	0.388	35%
Platforms	0.397	65%	0.034	13%	0.034	15%	0.067	14%	0.464	42%
Wells	0.027	4%	0.082	31%	0.137	63%	0.220	45%	0.247	23%
Platforms and Wells	0.424	69%	0.116	43%	0.171	78%	0.287	59%	0.711	65%
All	**0.612**	**100%**	**0.267**	**100%**	**0.219**	**100%**	**0.486**	**100%**	**1.098**	**100%**
	Sale 1 - LOF Average Spill Index [bbl]									
P/L	1	27%	12	39%	12	4%	24	8%	25	8%
Platforms	3	67%	3	10%	3	1%	6	2%	9	3%
Wells	0	5%	16	51%	255	95%	271	90%	271	89%
Platforms and Wells	3	73%	19	61%	258	96%	277	92%	280	92%
All	**4**	**100%**	**31**	**100%**	**270**	**100%**	**300**	**100%**	**304**	**100%**


Sale 1 - Spill Frequency
Huge Spills
=>10000 bbl
Large Spills
1000-9999 bbl
Small and Medium Spills
50-999 bbl
Spill Frequency per 1000 years
0
4
8
12
16
20
24
28
32
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
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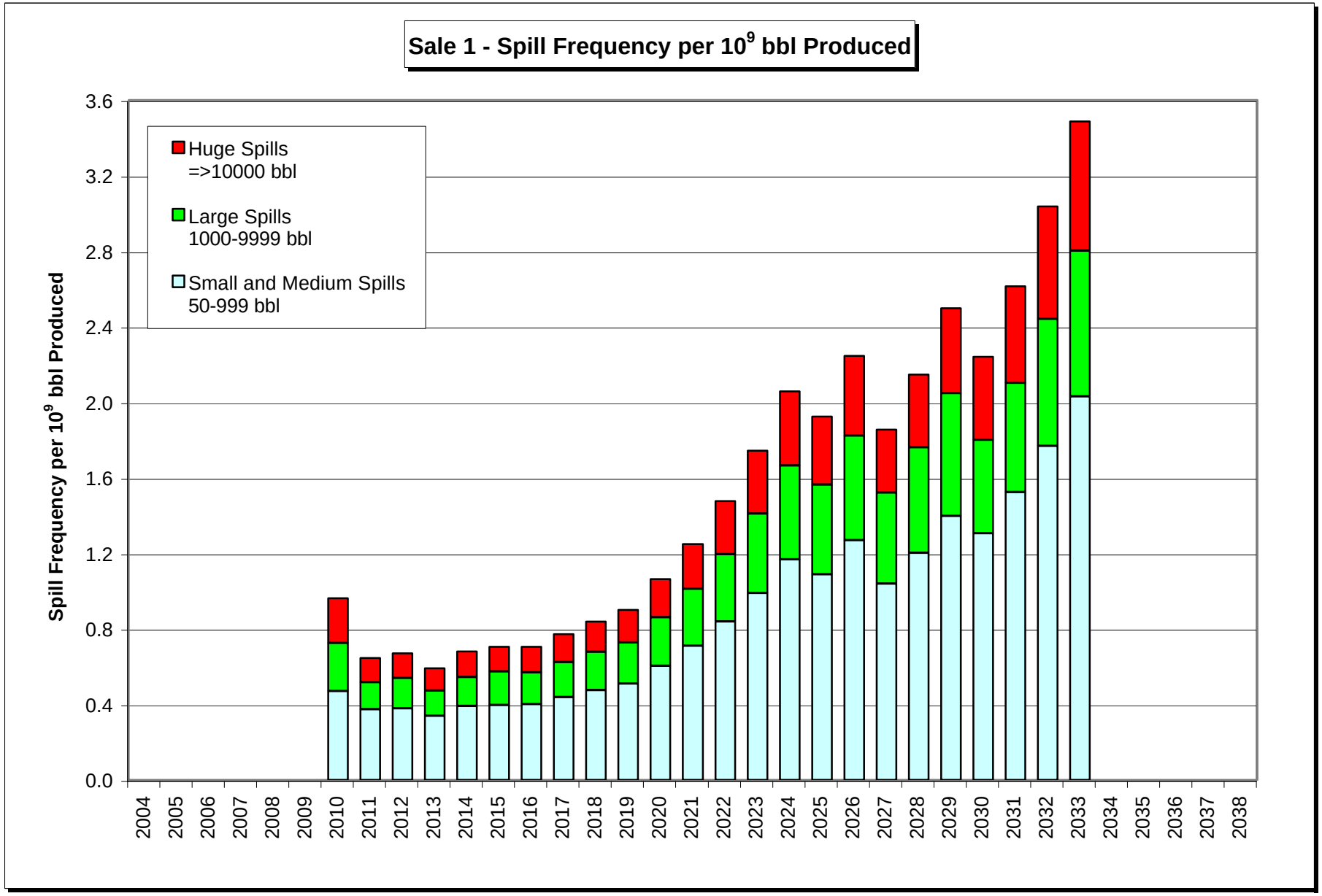
2038


Sale 1 - Spill Frequency per 10^9 bbl Produced
Huge Spills
=>10000 bbl
Large Spills
1000-9999 bbl
Small and Medium Spills
50-999 bbl
Spill Frequency per 10^9 bbl Produced
3.6
3.2
2.8
2.4
2.0
1.6
1.2
0.8
0.4
0.0
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
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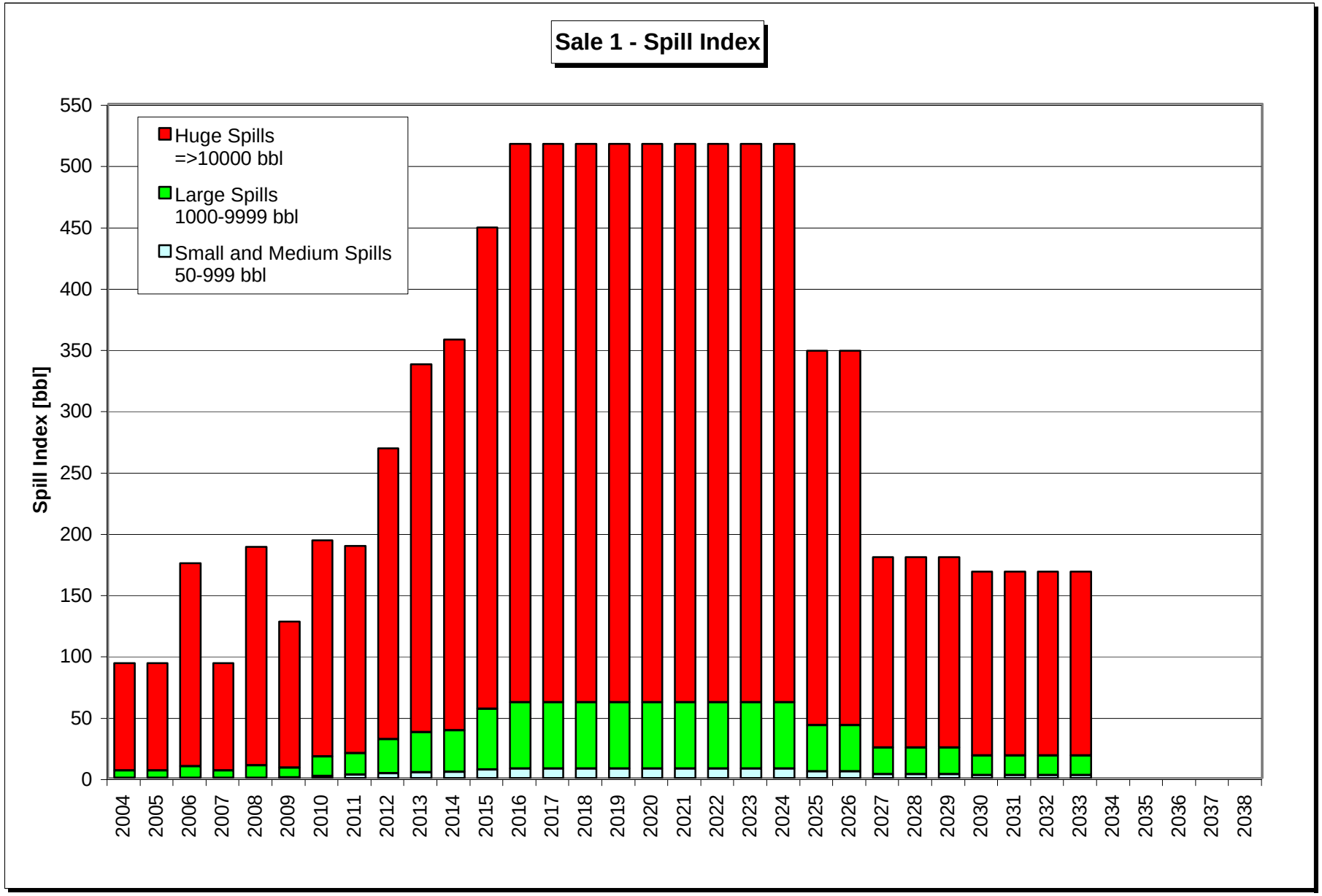
2036
2037
2038


Sale 1 - Spill Index
Huge Spills
=>10000 bbl
Large Spills
1000-9999 bbl
Small and Medium Spills
50-999 bbl
Spill Index [bbl]
0
50
100
150
200
250
300
350
400
450
500
550
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
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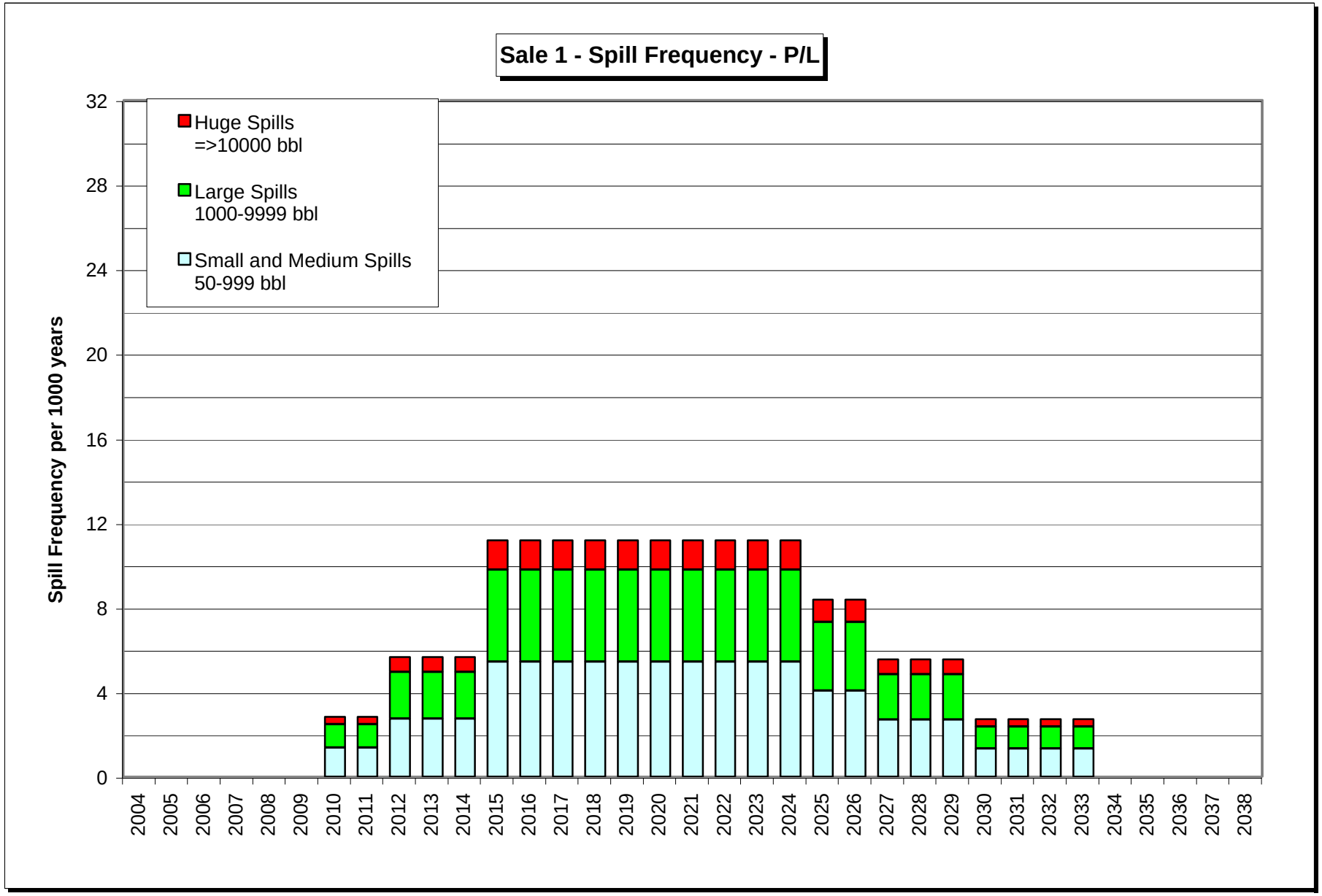
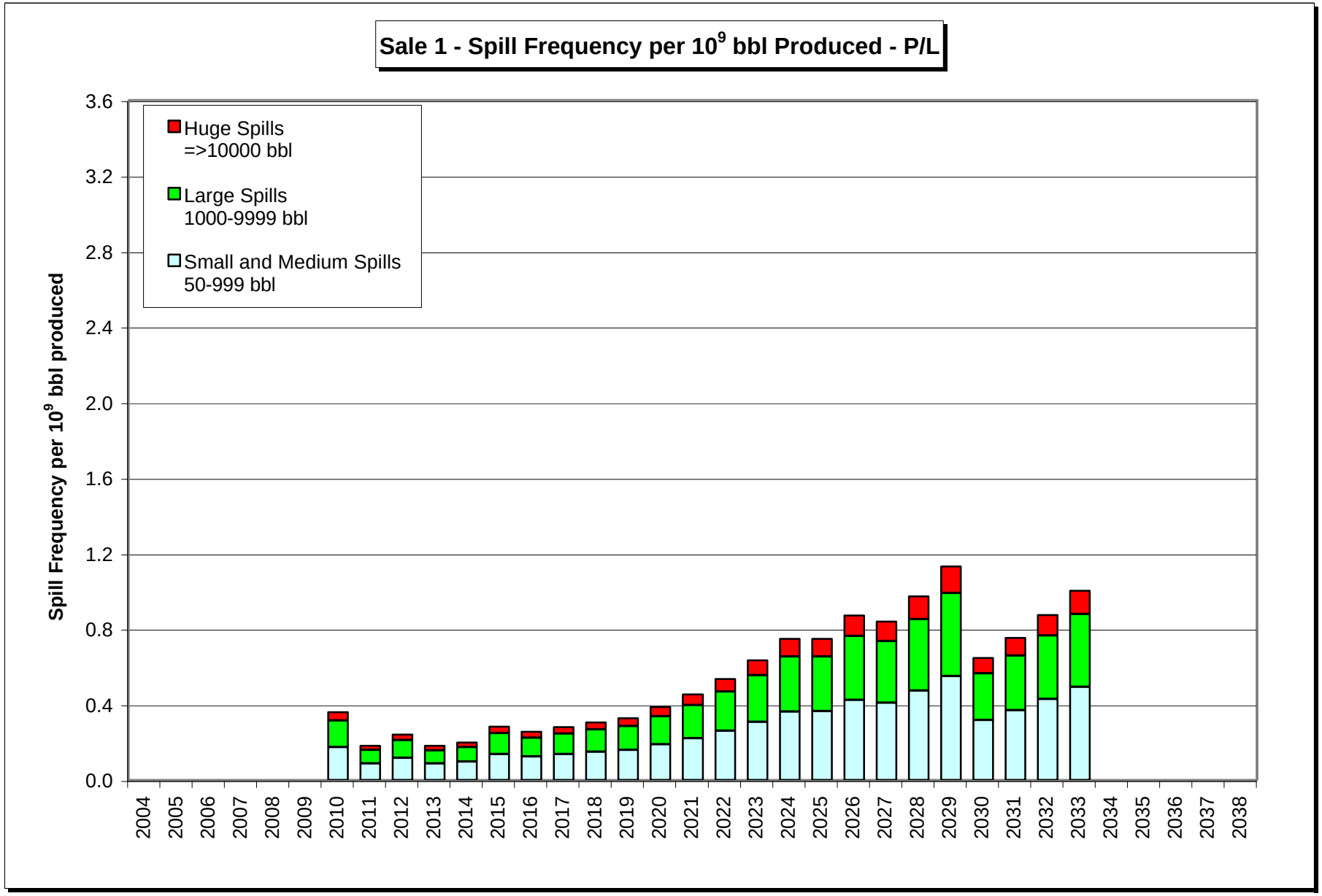
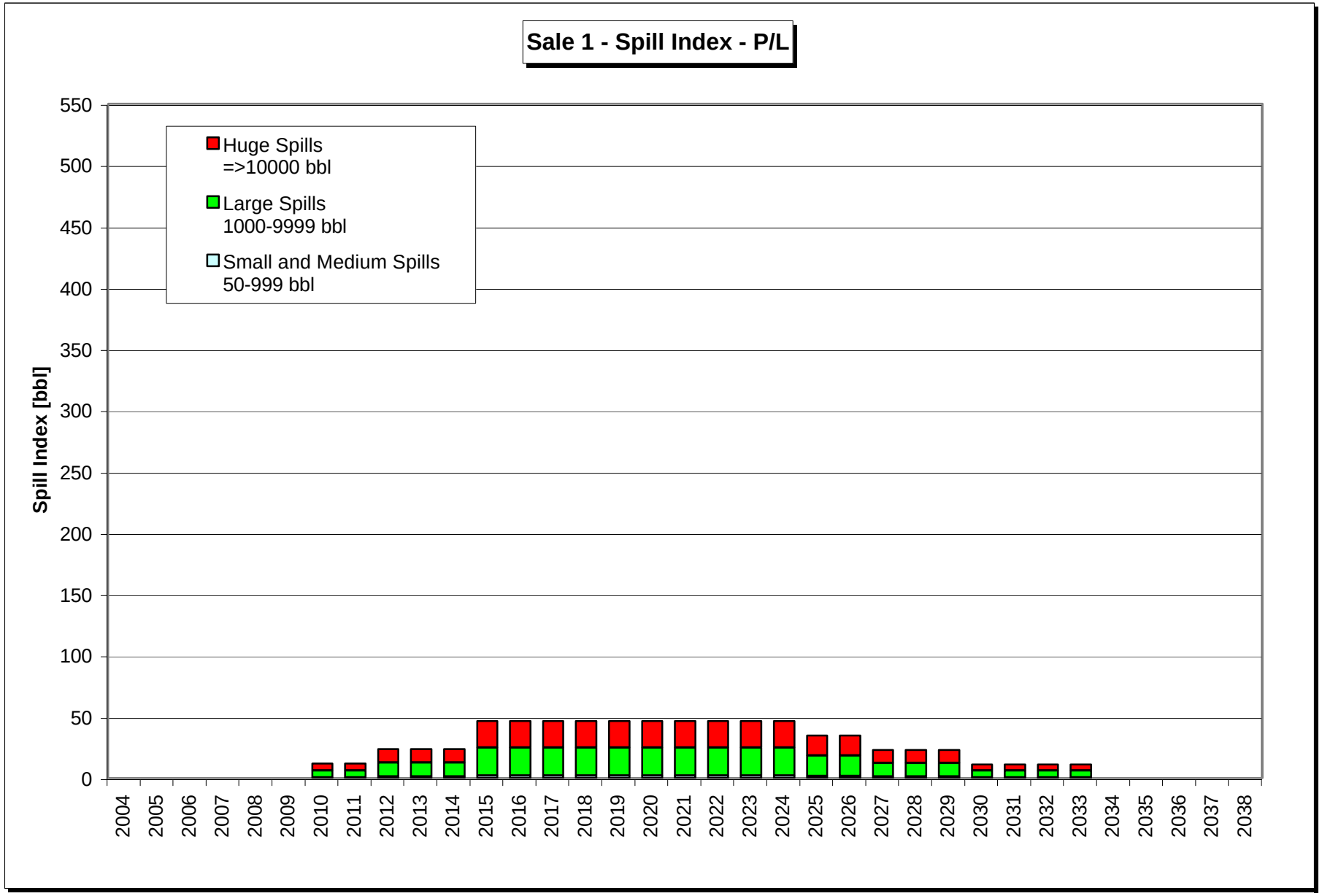
2030
2031
2032
2033
2034
2035
2036
2037
2038


Sale 1 - Spill Frequency - P/L
Huge Spills
=>10000 bbl
Large Spills
1000-9999 bbl
Small and Medium Spills
50-999 bbl
Spill Frequency per 1000 years
0
4
8
12
16
20
24
28
32
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
2031
2032
2033
2034
2035
2036
2037
2038


Sale 1 - Spill Frequency per 10^9 bbl Produced - P/L
Huge Spills =>10000 bbl
Large Spills 1000-9999 bbl
Small and Medium Spills 50-999 bbl
Spill Frequency per 10^9 bbl produced
3.6
3.2
2.8
2.4
2.0
1.6
1.2
0.8
0.4
0.0
2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038


Sale 1 - Spill Index - P/L
Huge Spills
=>10000 bbl
Large Spills
1000-9999 bbl
Small and Medium Spills
50-999 bbl
Spill Index [bbl]
550
500
450
400
350
300
250
200
150
100
50
0
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
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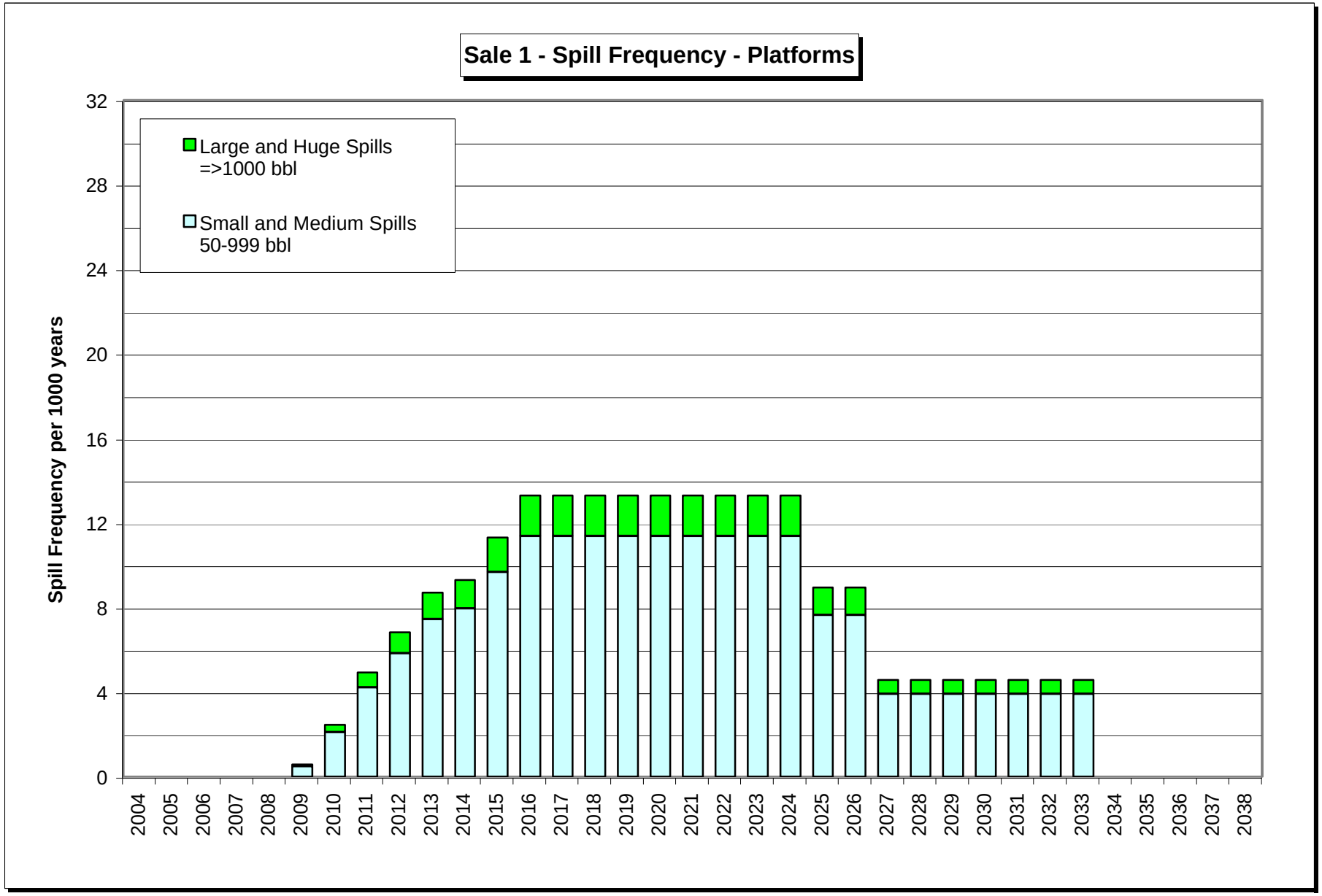
Sale 1 - Spill Frequency - Platforms
Large and Huge Spills =>1000 bbl
Small and Medium Spills 50-999 bbl
Spill Frequency per 1000 years
0
4
8
12
16
20
24
28
32
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
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2033
2034
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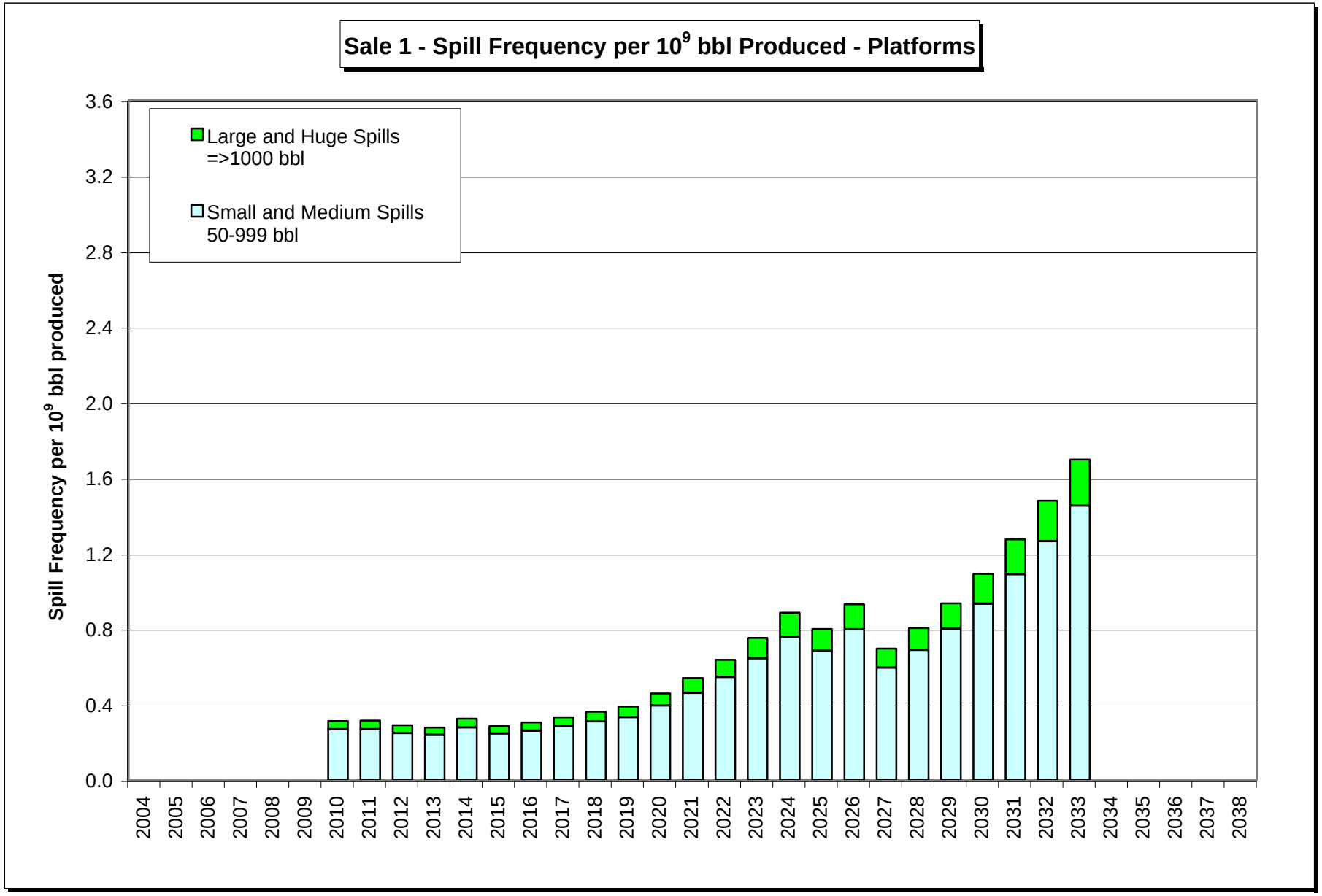
2036
2037
2038


Sale 1 - Spill Frequency per 10^9 bbl Produced - Platforms
Large and Huge Spills =>1000 bbl
Small and Medium Spills 50-999 bbl
Spill Frequency per 10^9 bbl produced
3.6
3.2
2.8
2.4
2.0
1.6
1.2
0.8
0.4
0.0
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
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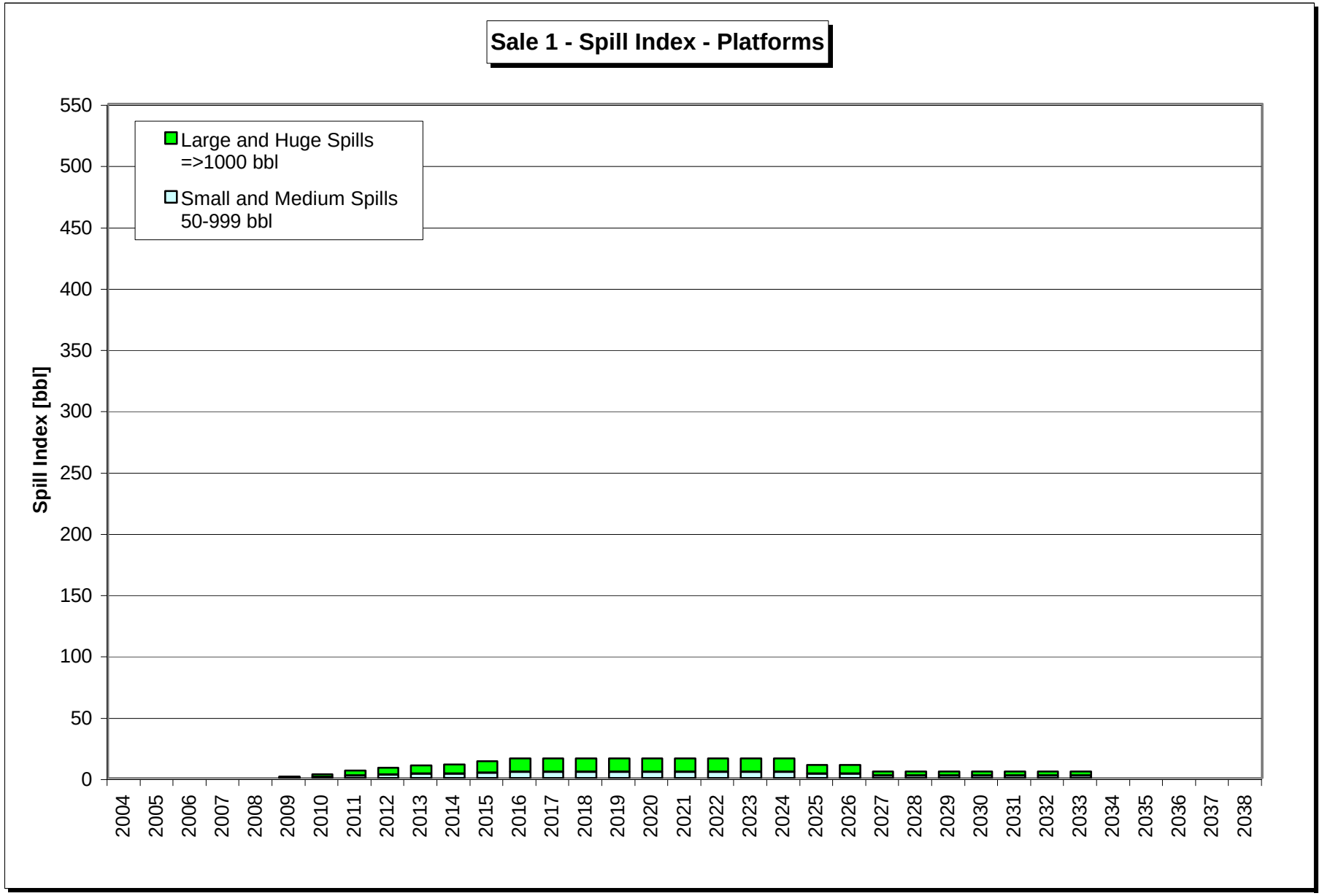
2038


Sale 1 - Spill Index - Platforms
Large and Huge Spills =>1000 bbl
Small and Medium Spills 50-999 bbl
Spill Index [bbl]
550
500
450
400
350
300
250
200
150
100
50
0
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
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2037
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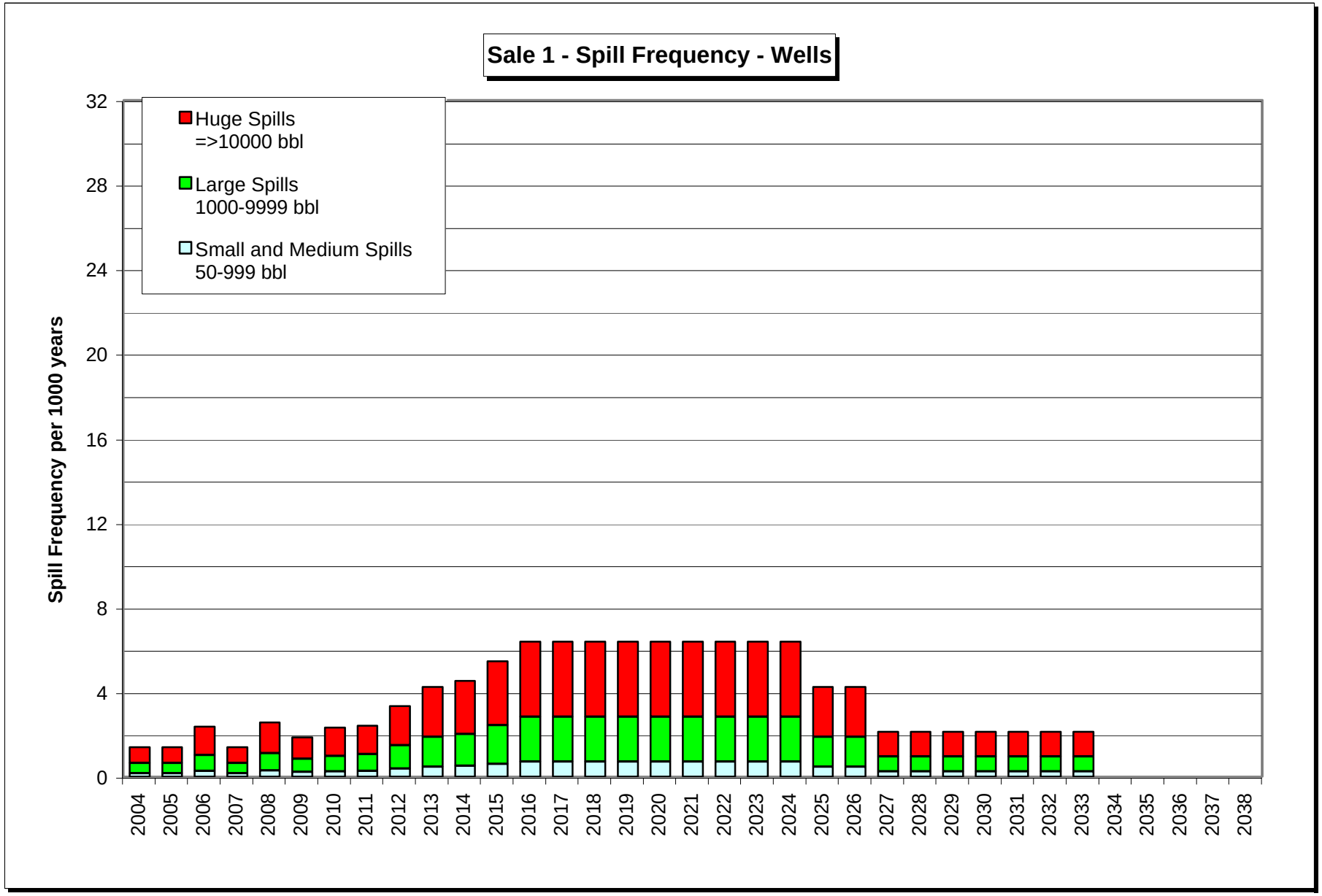
Sale 1 - Spill Frequency - Wells
Huge Spills
=>10000 bbl
Large Spills
1000-9999 bbl
Small and Medium Spills
50-999 bbl
Spill Frequency per 1000 years
0
4
8
12
16
20
24
28
32
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
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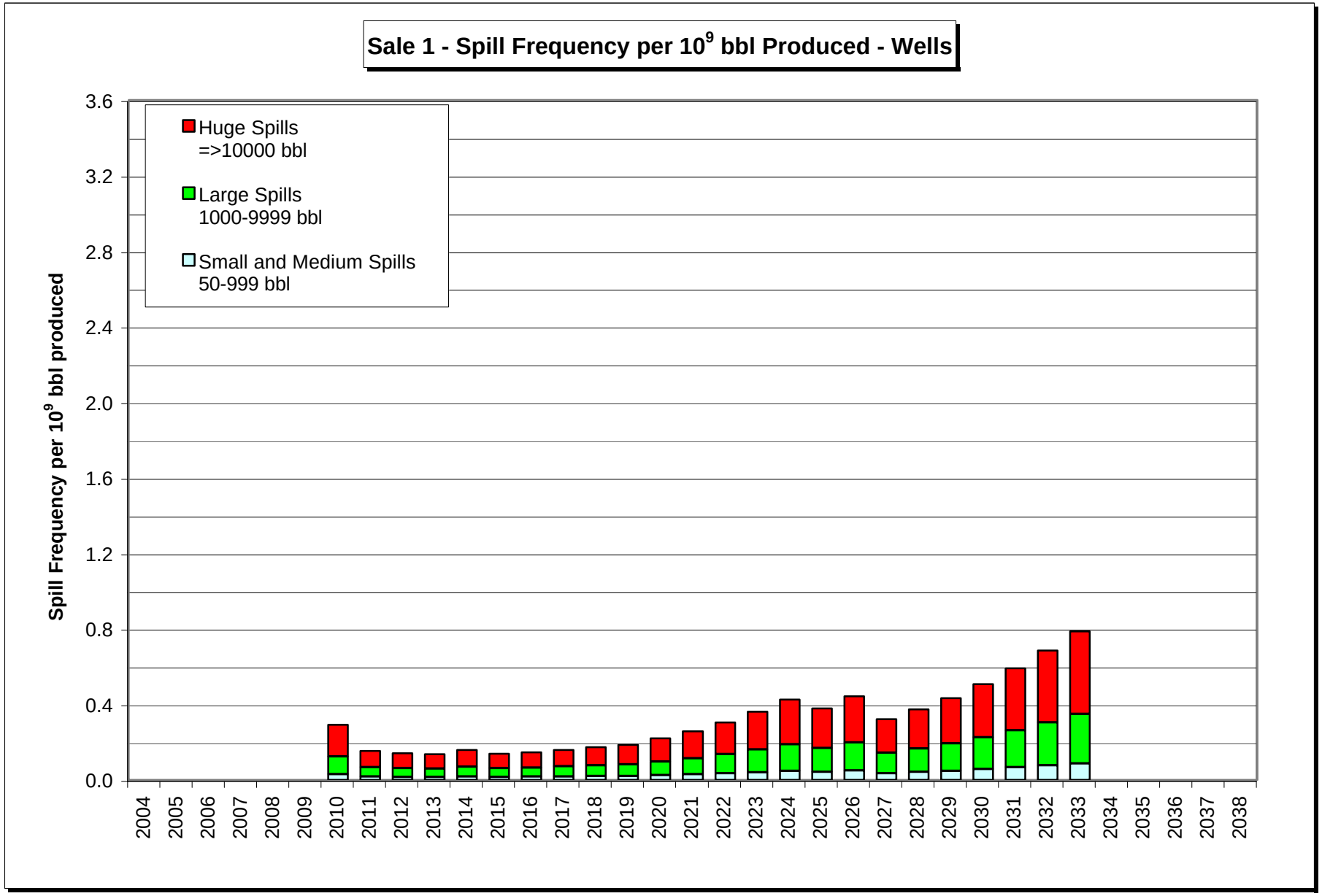
2036
2037
2038


Sale 1 - Spill Frequency per 10^9 bbl Produced - Wells
Huge Spills
=>10000 bbl
Large Spills
1000-9999 bbl
Small and Medium Spills
50-999 bbl
Spill Frequency per 10^9 bbl produced
3.6
3.2
2.8
2.4
2.0
1.6
1.2
0.8
0.4
0.0
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
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2015
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2017
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2019
2020
2021
2022
2023
2024
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2034
2035
2036
2037
2038

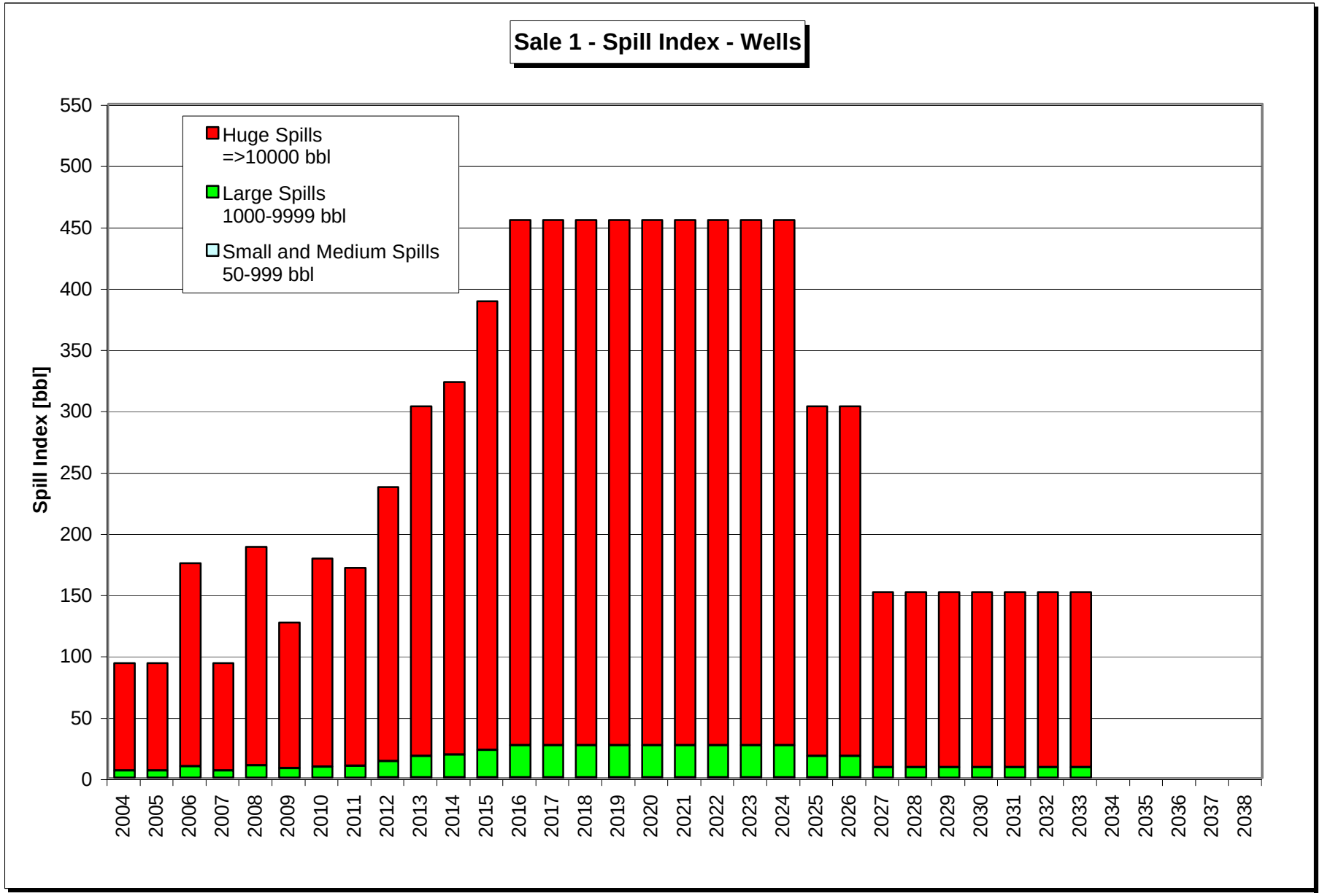
Sale 1 - Spill Index - Wells
Huge Spills
=>10000 bbl
Large Spills
1000-9999 bbl
Small and Medium Spills
50-999 bbl
Spill Index [bbl]
550
500
450
400
350
300
250
200
150
100
50
0
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
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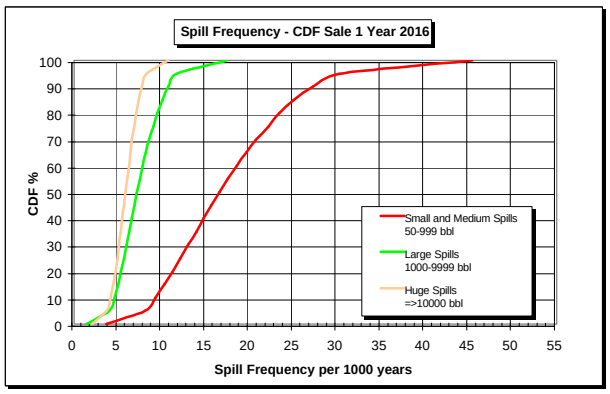
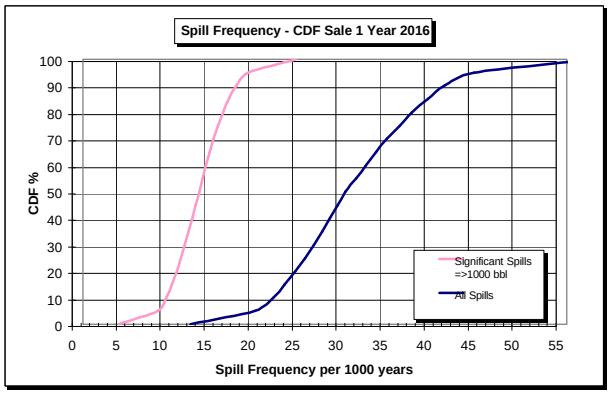
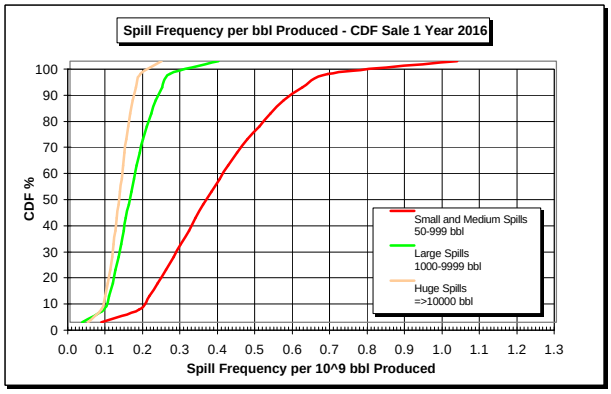
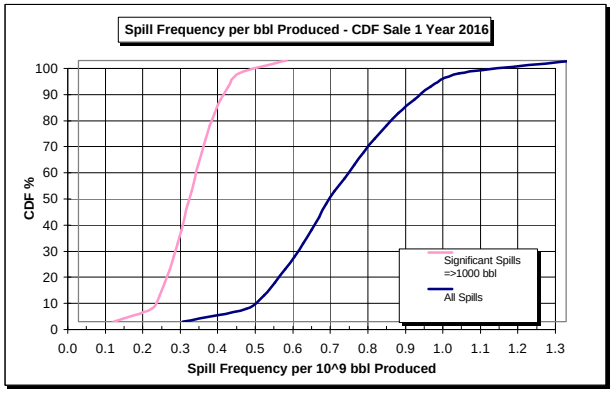
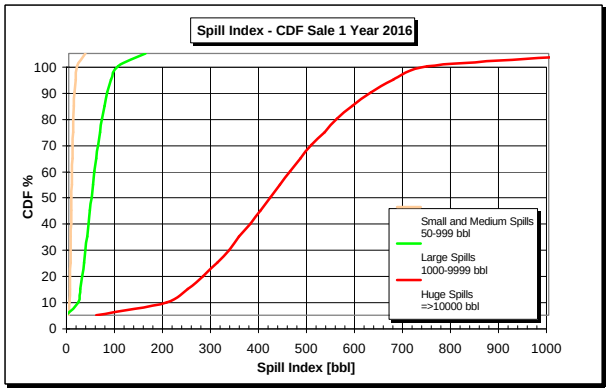
Figure 4.1.13 Spill Indicators - CDF - Year 2016











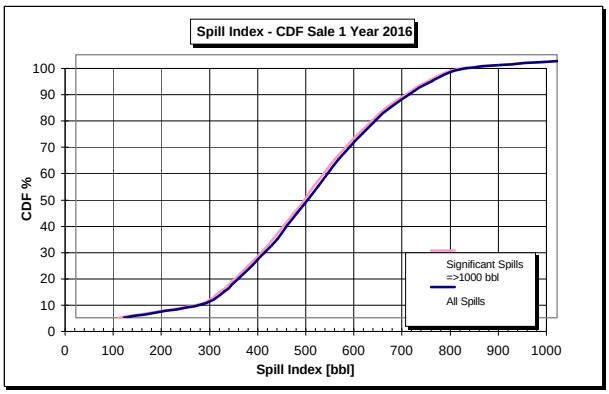
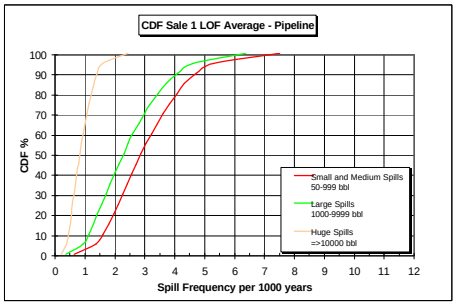
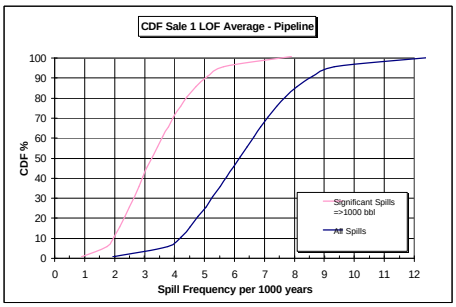
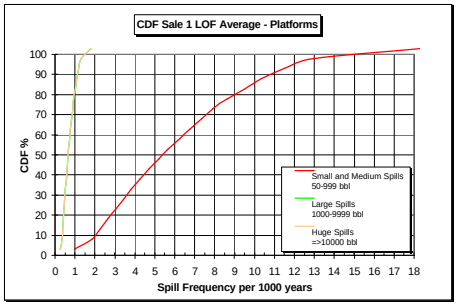
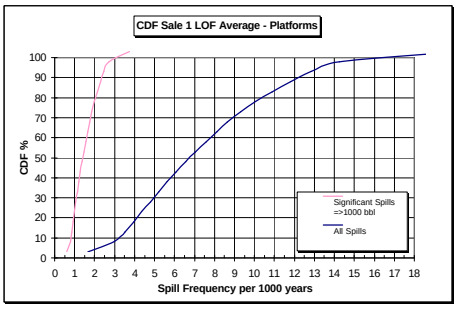


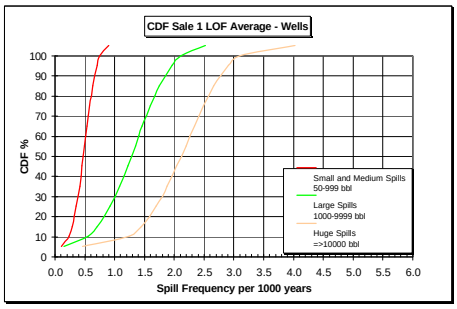
Figure 4.1.14 Spill Frequency - CDF - Sale 1

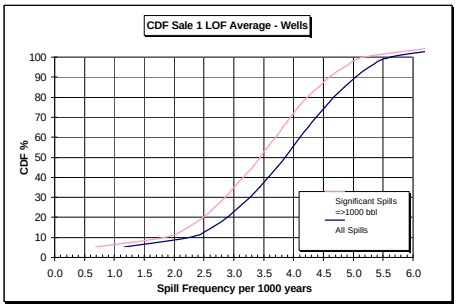


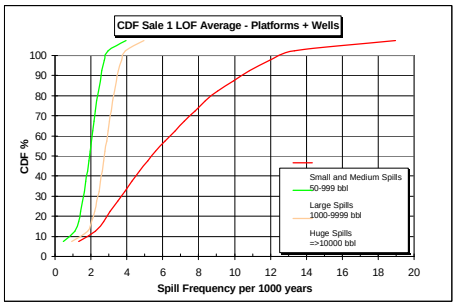


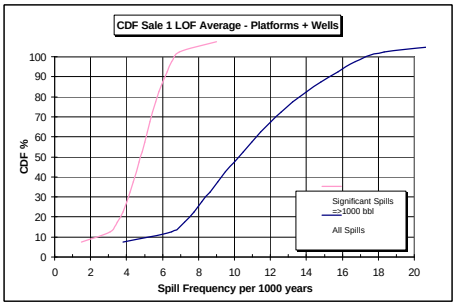


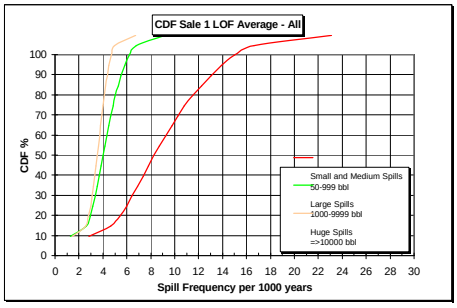












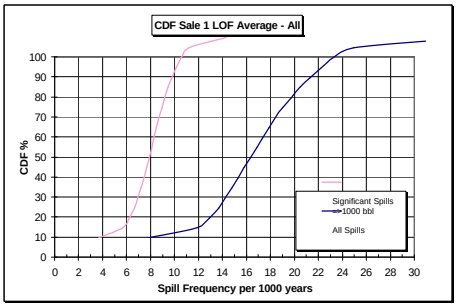


Figure 4.1.15 Spill Frequency per bbl produced - CDF - Sale 1

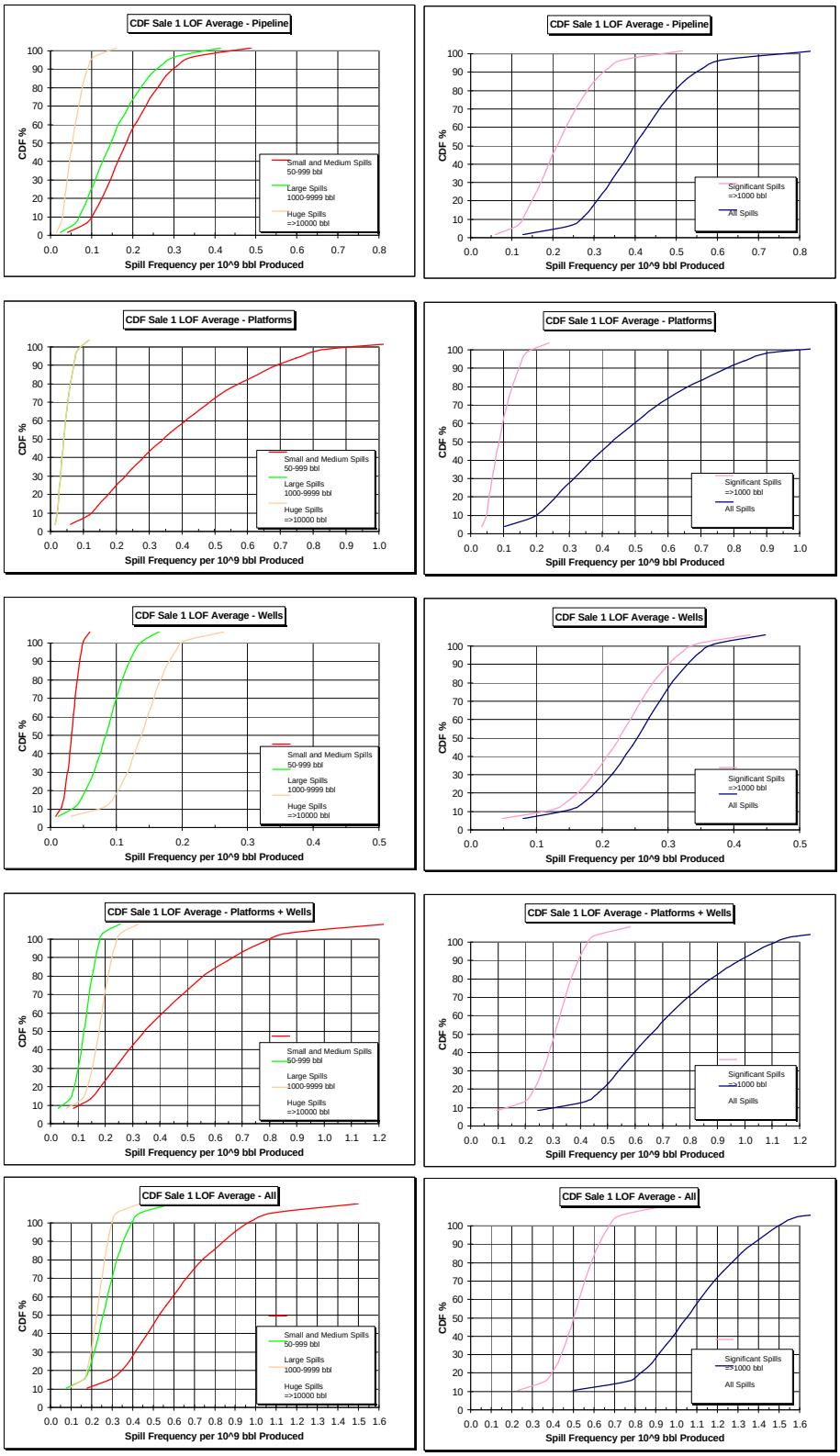


Figure 4.1.16 Spill Index [bbl] - CDF - Sale 1

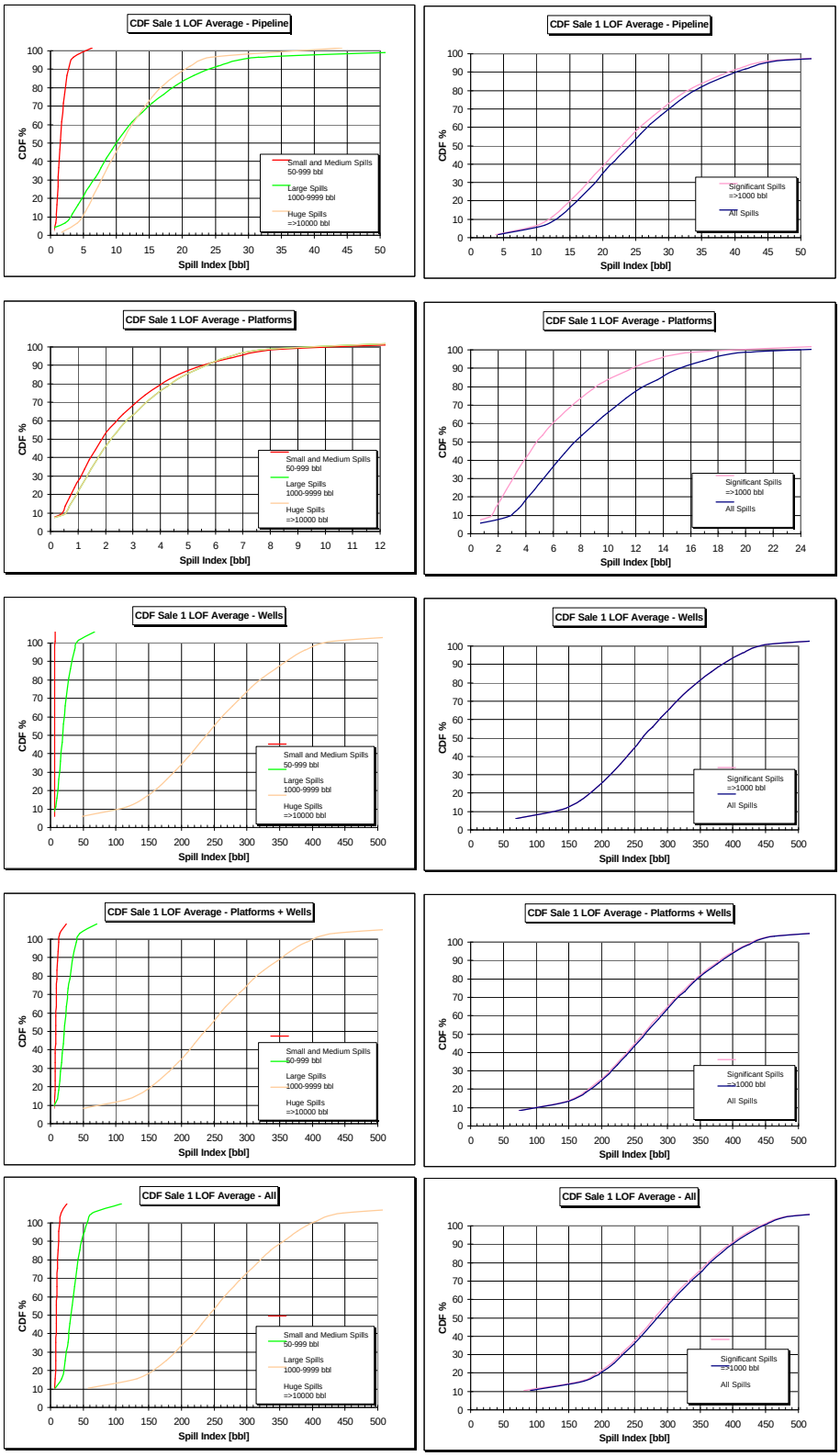
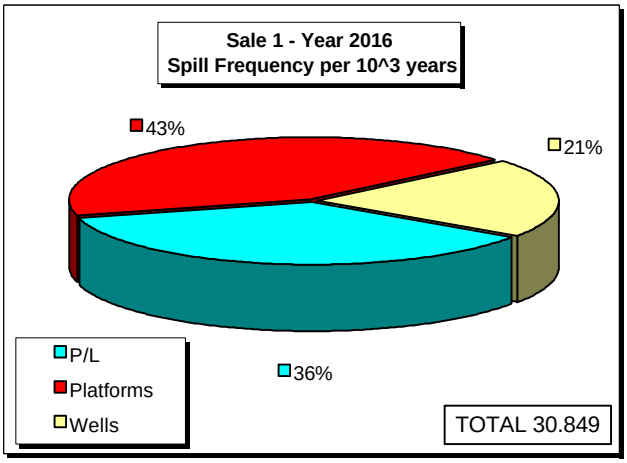
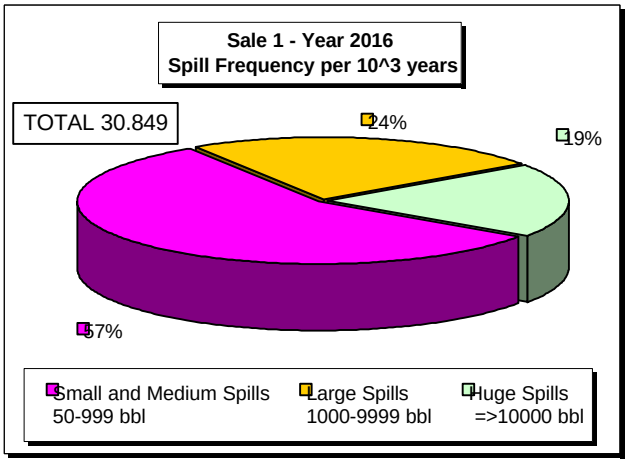


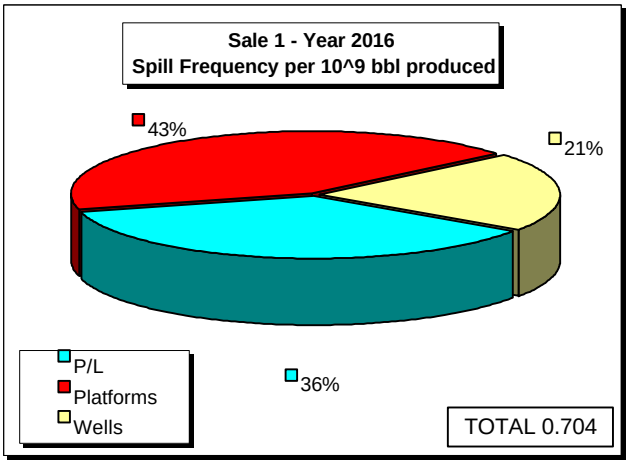
Figure 4.1.17
Sale 1 - Year 2016 - Spill Indicators

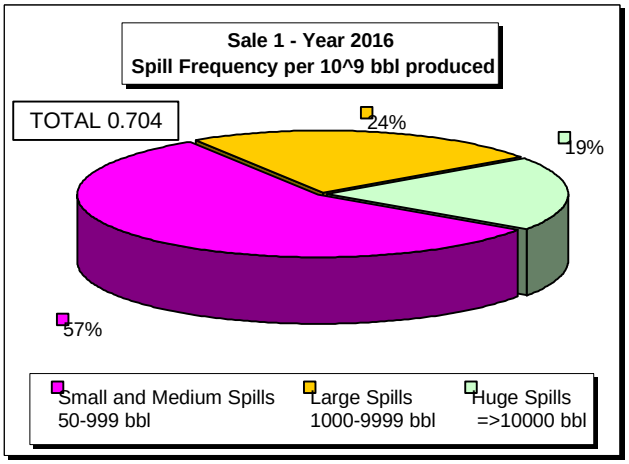
BY SPILL SOURCE

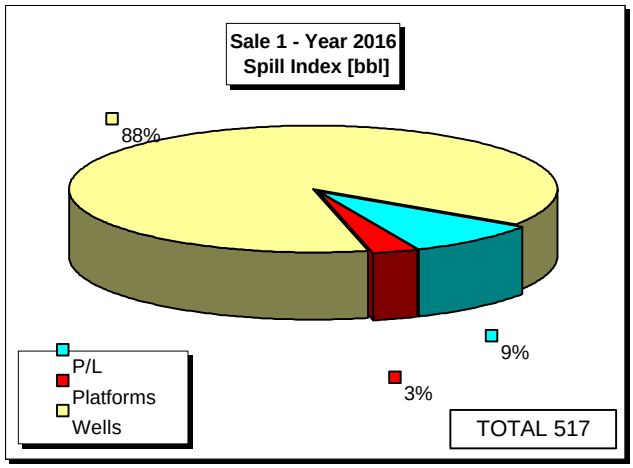


BY SPILL SIZE









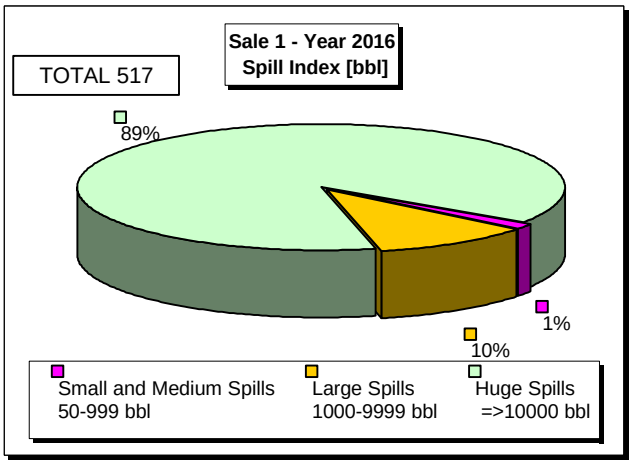
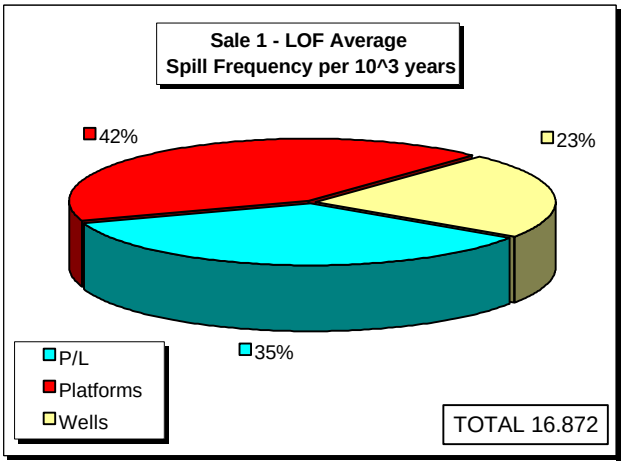
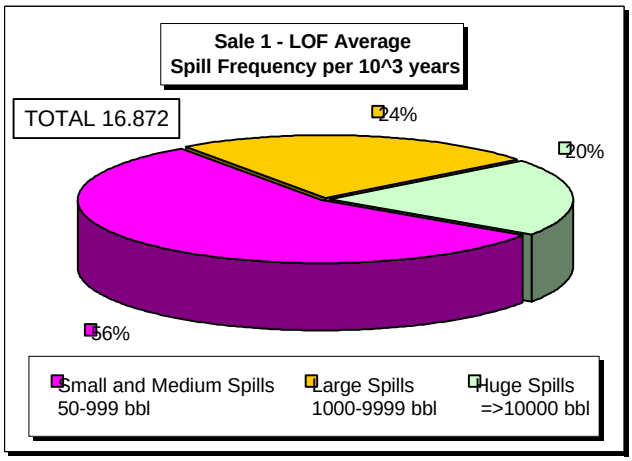


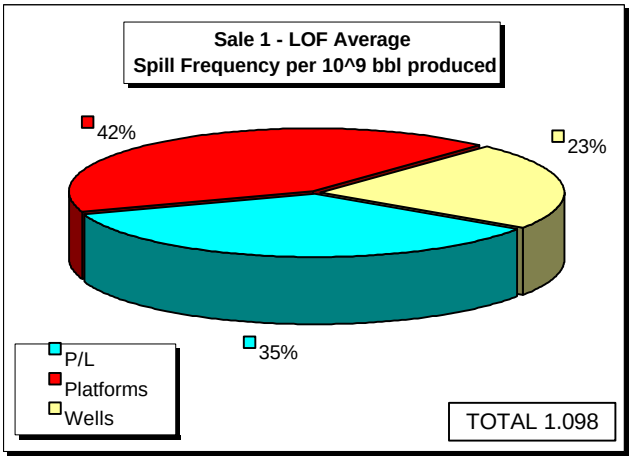
Figure 4.1.18
Sale 1 - LOF Average Spill Indicators

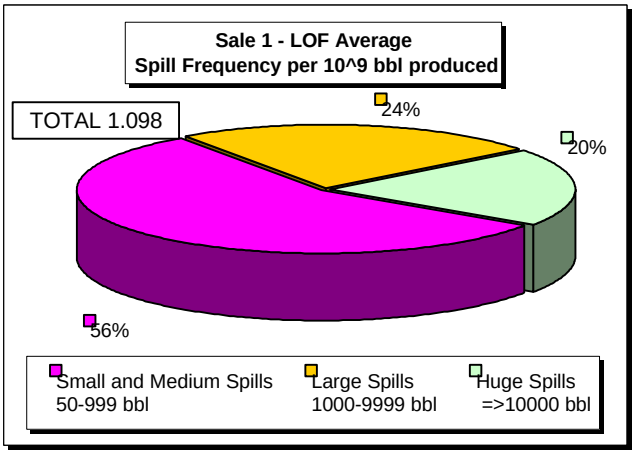
BY SPILL SOURCE

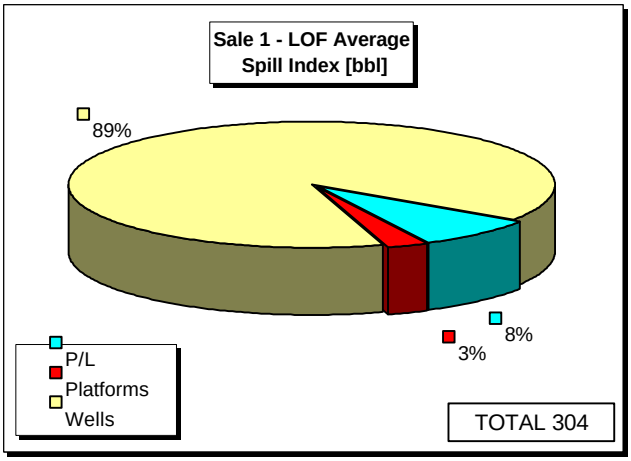


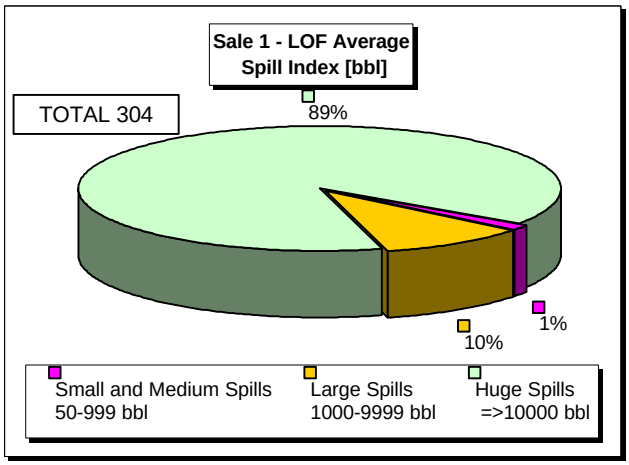
BY SPILL SIZE











APPENDIX 4
Spill Occurrence

4.2
Arctic Spill Occurrence
Beaufort Sea Sale 2

Table 4.2.1
Arctic Spill Occurrence Beaufort Sea Sale 2 P/L Spills

Year	Water Depth	P/L Dia <10"													P/L Dia >= 10"												
		P/L [miles]	Small Spills 50-99 bbl			Medium Spills 100-999 bbl			Large Spills 1000-9999 bbl			Huge Spills =>10000 bbl			P/L [miles]	Small Spills 50-99 bbl			Medium Spills 100-999 bbl			Large Spills 1000-9999 bbl			Huge Spills =>10000 bbl		
			Expected Spill [bbl] =		71	Expected Spill [bbl] =		485	Expected Spill [bbl] =		5279	Expected Spill [bbl] =		14880		Expected Spill [bbl] =		71	Expected Spill [bbl] =		516	Expected Spill [bbl] =		5176	Expected Spill [bbl] =		15552
		Cumm.	Frequency spills per 10^5km-year	Frequency spills per 10^2years	Spill Index bbl	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl	Cumm.	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl
2004	Shallow		3.671			6.432			4.375			1.144				2.519			5.975			6.870			2.200		
	Medium		3.587			6.283			4.004			1.041				2.433			5.826			6.476			2.087		
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total																										
2005	Shallow		3.671			6.432			4.375			1.144				2.519			5.975			6.870			2.200		
	Medium		3.587			6.283			4.004			1.041				2.433			5.826			6.476			2.087		
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total																										
2006	Shallow		3.671			6.432			4.375			1.144				2.519			5.975			6.870			2.200		
	Medium		3.587			6.283			4.004			1.041				2.433			5.826			6.476			2.087		
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total																										
2007	Shallow		3.671			6.432			4.375			1.144				2.519			5.975			6.870			2.200		
	Medium		3.587			6.283			4.004			1.041				2.433			5.826			6.476			2.087		
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total																										
2008	Shallow		3.671			6.432			4.375			1.144				2.519			5.975			6.870			2.200		
	Medium		3.587			6.283			4.004			1.041				2.433			5.826			6.476			2.087		
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total																										
2009	Shallow		3.671			6.432			4.375			1.144				2.519			5.975			6.870			2.200		
	Medium		3.587			6.283			4.004			1.041				2.433			5.826			6.476			2.087		
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total																										
2010	Shallow		3.671			6.432			4.375			1.144				2.519			5.975			6.870			2.200		
	Medium		3.587			6.283			4.004			1.041				2.433			5.826			6.476			2.087		
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total																										
2011	Shallow		3.671			6.432			4.375			1.144				2.519			5.975			6.870			2.200		
	Medium		3.587			6.283			4.004			1.041				2.433			5.826			6.476			2.087		
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total																										
2012	Shallow		3.671			6.432			4.375			1.144				2.519			5.975			6.870			2.200		
	Medium		3.587			6.283			4.004			1.041				2.433			5.826			6.476			2.087		
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total																										
2013	Shallow		3.671			6.432			4.375			1.144			10	2.519	0.405	0.03	5.975	0.961	0.50	6.870	1.105	5.72	2.200	0.354	5.50
	Medium		3.587			6.283			4.004			1.041				2.433			5.826			6.476			2.087		
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total														**10**		**0.405**	**0.03**		**0.961**	**0.50**		**1.105**	**5.72**		**0.354**	**5.50**
2014	Shallow		3.671			6.432			4.375			1.144			10	2.519	0.405	0.03	5.975	0.961	0.50	6.870	1.105	5.72	2.200	0.354	5.50
	Medium		3.587			6.283			4.004			1.041				2.433			5.826			6.476			2.087		
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total														**10**		**0.405**	**0.03**		**0.961**	**0.50**		**1.105**	**5.72**		**0.354**	**5.50**
2015	Shallow		3.671			6.432			4.375			1.144			10	2.519	0.405	0.03	5.975	0.961	0.50	6.870	1.105	5.72	2.200	0.354	5.50
	Medium		3.587			6.283			4.004			1.041				2.433			5.826			6.476			2.087		
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total														**10**		**0.405**	**0.03**		**0.961**	**0.50**		**1.105**	**5.72**		**0.354**	**5.50**
2016	Shallow		3.671			6.432			4.375			1.144			10	2.519	0.405	0.03	5.975	0.961	0.50	6.870	1.105	5.72	2.200	0.354	5.50
	Medium		3.587			6.283			4.004			1.041				2.433			5.826			6.476			2.087		
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total														**10**		**0.405**	**0.03**		**0.961**	**0.50**		**1.105**	**5.72**		**0.354**	**5.50**
2017	Shallow		3.671			6.432			4.375			1.144			20	2.519	0.811	0.06	5.975	1.923	0.99	6.870	2.211	11.44	2.200	0.708	11.01
	Medium	5	3.587	0.289	0.02	6.283	0.505	0.25	4.004	0.322	1.70	1.041	0.084	1.25	15	2.433	0.587	0.04	5.826	1.406	0.73	6.476	1.563	8.09	2.087	0.504	7.83
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total	**5**		**0.289**	**0.02**		**0.505**	**0.25**		**0.322**	**1.70**		**0.084**	**1.25**	**35**		**1.398**	**0.10**		**3.329**	**1.72**		**3.774**	**19.53**		**1.212**	**18.84**
2018	Shallow		3.671			6.432			4.375			1.144			20	2.519	0.811	0.06	5.975	1.923	0.99	6.870	2.211	11.44	2.200	0.708	11.01
	Medium	5	3.587	0.289	0.02	6.283	0.505	0.25	4.004	0.322	1.70	1.041	0.084	1.25	15	2.433	0.587	0.04	5.826	1.406	0.73	6.476	1.563	8.09	2.087	0.504	7.83
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total	**5**		**0.289**	**0.02**		**0.505**	**0.25**		**0.322**	**1.70**		**0.084**	**1.25**	**35**		**1.398**	**0.10**		**3.329**	**1.72**		**3.774**	**19.53**		**1.212**	**18.84**
2019	Shallow		3.671			6.432			4.375			1.144			20	2.519	0.811	0.06	5.975	1.923	0.99	6.870	2.211	11.44	2.200	0.708	11.01
	Medium	5	3.587	0.289	0.02	6.283	0.505	0.25	4.004	0.322	1.70	1.041	0.084	1.25	15	2.433	0.587	0.04	5.826	1.406	0.73	6.476	1.563	8.09	2.087	0.504	7.83
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total	**5**		**0.289**	**0.02**		**0.505**	**0.25**		**0.322**	**1.70**		**0.084**	**1.25**	**35**		**1.398**	**0.10**		**3.329**	**1.72**		**3.774**	**19.53**		**1.212**	**18.84**
2020	Shallow		3.671			6.432			4.375			1.144			20	2.519	0.811	0.06	5.975	1.923	0.99	6.870	2.211	11.44	2.200	0.708	11.01
	Medium	5	3.587	0.289	0.02	6.283	0.505	0.25	4.004	0.322	1.70	1.041	0.084	1.25	15	2.433	0.587	0.04	5.826	1.406	0.73	6.476	1.563	8.09	2.087	0.504	7.83
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total	**5**		**0.289**	**0.02**		**0.505**	**0.25**		**0.322**	**1.70**		**0.084**	**1.25**	**35**		**1.398**	**0.10**		**3.329**	**1.72**		**3.774**	**19.53**		**1.212**	**18.84**
2021	Shallow		3.671			6.432			4.375			1.144			20	2.519	0.811	0.06	5.975	1.923	0.99	6.870	2.211	11.44	2.200	0.708	11.01
	Medium	5	3.587	0.289	0.02	6.283	0.505	0.25	4.004	0.322	1.70	1.041	0.084	1.25	15	2.433	0.587	0.04	5.826	1.406	0.73	6.476	1.563	8.09	2.087	0.504	7.83
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total	**5**		**0.289**	**0.02**		**0.505**	**0.25**		**0.322**	**1.70**		**0.084**	**1.25**	**35**		**1.398**	**0.10**		**3.329**	**1.72**		**3.774**	**19.53**		**1.212**	**18.84**
2022	Shallow		3.671			6.432			4.375			1.144			20	2.519	0.811	0.06	5.975	1.923	0.99	6.870	2.211	11.44	2.200	0.708	11.01
	Medium	5	3.587	0.289	0.02	6.283	0.505	0.25	4.004	0.322	1.70	1.041	0.084	1.25	15	2.433	0.587	0.04	5.826	1.406	0.73	6.476	1.563	8.09	2.087	0.504	7.83
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total	**5**		**0.289**	**0.02**		**0.505**	**0.25**		**0.322**	**1.70**		**0.084**	**1.25**	**35**		**1.398**	**0.10**		**3.329**	**1.72**		**3.774**	**19.53**		**1.212**	**18.84**
2023	Shallow		3.671			6.432			4.375			1.144			20	2.519	0.811	0.06	5.975	1.923	0.99	6.870	2.211	11.44	2.200	0.708	11.01
	Medium	5	3.587	0.289	0.02	6.283	0.505	0.25	4.004	0.322	1.70	1.041	0.084	1.25	15	2.433	0.587	0.04	5.826	1.406	0.73	6.476	1.563	8.09	2.087	0.504	7.83
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		

Table 4.2.1
Arctic Spill Occurrence Beaufort Sea Sale 2 P/L Spills

Year	Water Depth	P/L Dia <10"													P/L Dia >= 10"												
		P/L [miles]	Small Spills 50-99 bbl			Medium Spills 100-999 bbl			Large Spills 1000-9999 bbl			Huge Spills =>10000 bbl			P/L [miles]	Small Spills 50-99 bbl			Medium Spills 100-999 bbl			Large Spills 1000-9999 bbl			Huge Spills =>10000 bbl		
			Expected Spill [bbl] =		71	Expected Spill [bbl] =		485	Expected Spill [bbl] =		5279	Expected Spill [bbl] =		14880		Expected Spill [bbl] =		71	Expected Spill [bbl] =		516	Expected Spill [bbl] =		5176	Expected Spill [bbl] =		15552
		Cumm.	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl	Cumm.	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl
	Total	**5**		**0.289**	**0.02**		**0.505**	**0.25**		**0.322**	**1.70**		**0.084**	**1.25**	**35**		**1.398**	**0.10**		**3.329**	**1.72**		**3.774**	**19.53**		**1.212**	**18.84**
2024	Shallow		3.671			6.432			4.375			1.144			20	2.519	0.811	0.06	5.975	1.923	0.99	6.870	2.211	11.44	2.200	0.708	11.01
	Medium	5	3.587	0.289	0.02	6.283	0.505	0.25	4.004	0.322	1.70	1.041	0.084	1.25	15	2.433	0.587	0.04	5.826	1.406	0.73	6.476	1.563	8.09	2.087	0.504	7.83
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total	**5**		**0.289**	**0.02**		**0.505**	**0.25**		**0.322**	**1.70**		**0.084**	**1.25**	**35**		**1.398**	**0.10**		**3.329**	**1.72**		**3.774**	**19.53**		**1.212**	**18.84**
2025	Shallow		3.671			6.432			4.375			1.144			20	2.519	0.811	0.06	5.975	1.923	0.99	6.870	2.211	11.44	2.200	0.708	11.01
	Medium	5	3.587	0.289	0.02	6.283	0.505	0.25	4.004	0.322	1.70	1.041	0.084	1.25	15	2.433	0.587	0.04	5.826	1.406	0.73	6.476	1.563	8.09	2.087	0.504	7.83
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total	**5**		**0.289**	**0.02**		**0.505**	**0.25**		**0.322**	**1.70**		**0.084**	**1.25**	**35**		**1.398**	**0.10**		**3.329**	**1.72**		**3.774**	**19.53**		**1.212**	**18.84**
2026	Shallow		3.671			6.432			4.375			1.144			20	2.519	0.811	0.06	5.975	1.923	0.99	6.870	2.211	11.44	2.200	0.708	11.01
	Medium	5	3.587	0.289	0.02	6.283	0.505	0.25	4.004	0.322	1.70	1.041	0.084	1.25	15	2.433	0.587	0.04	5.826	1.406	0.73	6.476	1.563	8.09	2.087	0.504	7.83
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total	**5**		**0.289**	**0.02**		**0.505**	**0.25**		**0.322**	**1.70**		**0.084**	**1.25**	**35**		**1.398**	**0.10**		**3.329**	**1.72**		**3.774**	**19.53**		**1.212**	**18.84**
2027	Shallow		3.671			6.432			4.375			1.144			20	2.519	0.811	0.06	5.975	1.923	0.99	6.870	2.211	11.44	2.200	0.708	11.01
	Medium	5	3.587	0.289	0.02	6.283	0.505	0.25	4.004	0.322	1.70	1.041	0.084	1.25	15	2.433	0.587	0.04	5.826	1.406	0.73	6.476	1.563	8.09	2.087	0.504	7.83
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total	**5**		**0.289**	**0.02**		**0.505**	**0.25**		**0.322**	**1.70**		**0.084**	**1.25**	**35**		**1.398**	**0.10**		**3.329**	**1.72**		**3.774**	**19.53**		**1.212**	**18.84**
2028	Shallow		3.671			6.432			4.375			1.144			5	2.519	0.203	0.01	5.975	0.481	0.25	6.870	0.553	2.86	2.200	0.177	2.75
	Medium	5	3.587	0.289	0.02	6.283	0.505	0.25	4.004	0.322	1.70	1.041	0.084	1.25	15	2.433	0.587	0.04	5.826	1.406	0.73	6.476	1.563	8.09	2.087	0.504	7.83
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total	**5**		**0.289**	**0.02**		**0.505**	**0.25**		**0.322**	**1.70**		**0.084**	**1.25**	**20**		**0.790**	**0.06**		**1.887**	**0.97**		**2.116**	**10.95**		**0.681**	**10.59**
2029	Shallow		3.671			6.432			4.375			1.144			5	2.519	0.203	0.01	5.975	0.481	0.25	6.870	0.553	2.86	2.200	0.177	2.75
	Medium	5	3.587	0.289	0.02	6.283	0.505	0.25	4.004	0.322	1.70	1.041	0.084	1.25	15	2.433	0.587	0.04	5.826	1.406	0.73	6.476	1.563	8.09	2.087	0.504	7.83
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total	**5**		**0.289**	**0.02**		**0.505**	**0.25**		**0.322**	**1.70**		**0.084**	**1.25**	**20**		**0.790**	**0.06**		**1.887**	**0.97**		**2.116**	**10.95**		**0.681**	**10.59**
2030	Shallow		3.671			6.432			4.375			1.144			5	2.519	0.203	0.01	5.975	0.481	0.25	6.870	0.553	2.86	2.200	0.177	2.75
	Medium	5	3.587	0.289	0.02	6.283	0.505	0.25	4.004	0.322	1.70	1.041	0.084	1.25	15	2.433	0.587	0.04	5.826	1.406	0.73	6.476	1.563	8.09	2.087	0.504	7.83
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total	**5**		**0.289**	**0.02**		**0.505**	**0.25**		**0.322**	**1.70**		**0.084**	**1.25**	**20**		**0.790**	**0.06**		**1.887**	**0.97**		**2.116**	**10.95**		**0.681**	**10.59**
2031	Shallow		3.671			6.432			4.375			1.144			5	2.519	0.203	0.01	5.975	0.481	0.25	6.870	0.553	2.86	2.200	0.177	2.75
	Medium	5	3.587	0.289	0.02	6.283	0.505	0.25	4.004	0.322	1.70	1.041	0.084	1.25	15	2.433	0.587	0.04	5.826	1.406	0.73	6.476	1.563	8.09	2.087	0.504	7.83
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total	**5**		**0.289**	**0.02**		**0.505**	**0.25**		**0.322**	**1.70**		**0.084**	**1.25**	**20**		**0.790**	**0.06**		**1.887**	**0.97**		**2.116**	**10.95**		**0.681**	**10.59**
2032	Shallow		3.671			6.432			4.375			1.144			5	2.519	0.203	0.01	5.975	0.481	0.25	6.870	0.553	2.86	2.200	0.177	2.75
	Medium	5	3.587	0.289	0.02	6.283	0.505	0.25	4.004	0.322	1.70	1.041	0.084	1.25	15	2.433	0.587	0.04	5.826	1.406	0.73	6.476	1.563	8.09	2.087	0.504	7.83
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total	**5**		**0.289**	**0.02**		**0.505**	**0.25**		**0.322**	**1.70**		**0.084**	**1.25**	**20**		**0.790**	**0.06**		**1.887**	**0.97**		**2.116**	**10.95**		**0.681**	**10.59**
2033	Shallow		3.671			6.432			4.375			1.144			5	2.519	0.203	0.01	5.975	0.481	0.25	6.870	0.553	2.86	2.200	0.177	2.75
	Medium	5	3.587	0.289	0.02	6.283	0.505	0.25	4.004	0.322	1.70	1.041	0.084	1.25	15	2.433	0.587	0.04	5.826	1.406	0.73	6.476	1.563	8.09	2.087	0.504	7.83
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total	**5**		**0.289**	**0.02**		**0.505**	**0.25**		**0.322**	**1.70**		**0.084**	**1.25**	**20**		**0.790**	**0.06**		**1.887**	**0.97**		**2.116**	**10.95**		**0.681**	**10.59**
2034	Shallow		3.671			6.432			4.375			1.144			5	2.519	0.203	0.01	5.975	0.481	0.25	6.870	0.553	2.86	2.200	0.177	2.75
	Medium	5	3.587	0.289	0.02	6.283	0.505	0.25	4.004	0.322	1.70	1.041	0.084	1.25	15	2.433	0.587	0.04	5.826	1.406	0.73	6.476	1.563	8.09	2.087	0.504	7.83
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total	**5**		**0.289**	**0.02**		**0.505**	**0.25**		**0.322**	**1.70**		**0.084**	**1.25**	**20**		**0.790**	**0.06**		**1.887**	**0.97**		**2.116**	**10.95**		**0.681**	**10.59**
2035	Shallow		3.671			6.432			4.375			1.144			5	2.519	0.203	0.01	5.975	0.481	0.25	6.870	0.553	2.86	2.200	0.177	2.75
	Medium	5	3.587	0.289	0.02	6.283	0.505	0.25	4.004	0.322	1.70	1.041	0.084	1.25	15	2.433	0.587	0.04	5.826	1.406	0.73	6.476	1.563	8.09	2.087	0.504	7.83
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total	**5**		**0.289**	**0.02**		**0.505**	**0.25**		**0.322**	**1.70**		**0.084**	**1.25**	**20**		**0.790**	**0.06**		**1.887**	**0.97**		**2.116**	**10.95**		**0.681**	**10.59**
2036	Shallow		3.671			6.432			4.375			1.144				2.519			5.975			6.870			2.200		
	Medium		3.587			6.283			4.004			1.041			5	2.433	0.196	0.01	5.826	0.469	0.24	6.476	0.521	2.70	2.087	0.168	2.61
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total														**5**		**0.196**	**0.01**		**0.469**	**0.24**		**0.521**	**2.70**		**0.168**	**2.61**
2037	Shallow		3.671			6.432			4.375			1.144				2.519			5.975			6.870			2.200		
	Medium		3.587			6.283			4.004			1.041			5	2.433	0.196	0.01	5.826	0.469	0.24	6.476	0.521	2.70	2.087	0.168	2.61
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total														**5**		**0.196**	**0.01**		**0.469**	**0.24**		**0.521**	**2.70**		**0.168**	**2.61**
2038	Shallow		3.671			6.432			4.375			1.144				2.519			5.975			6.870			2.200		
	Medium		3.587			6.283			4.004			1.041			5	2.433	0.196	0.01	5.826	0.469	0.24	6.476	0.521	2.70	2.087	0.168	2.61
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total														**5**		**0.196**	**0.01**		**0.469**	**0.24**		**0.521**	**2.70**		**0.168**	**2.61**

Table 4.2.2
Arctic Spill Occurrence - Sale 2 - P/L - Summary

Year	Production [MMbbl]	Small Spills 50-99 bbl			Medium Spills 100-999 bbl			Small and Medium Spills 50-999 bbl			Large Spills 1000-9999 bbl			Huge Spills =>10000 bbl			Significant Spills =>1000 bbl			All Spills		
		Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 103years	Frequency Spills per 109 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]
2004																						
2005																						
2006																						
2007																						
2008																						
2009																						
2010																						
2011																						
2012																						
2013	**7.9**	0.405	0.051	0.029	0.961	0.122	0.496	1.367	0.173	0.525	1.105	0.140	5.721	0.354	0.045	5.504	1.459	0.185	11.226	2.826	0.358	11.751
2014	**15.7**	0.405	0.026	0.029	0.961	0.061	0.496	1.367	0.087	0.525	1.105	0.070	5.721	0.354	0.023	5.504	1.459	0.093	11.226	2.826	0.180	11.751
2015	**15.7**	0.405	0.026	0.029	0.961	0.061	0.496	1.367	0.087	0.525	1.105	0.070	5.721	0.354	0.023	5.504	1.459	0.093	11.226	2.826	0.180	11.751
2016	**15.7**	0.405	0.026	0.029	0.961	0.061	0.496	1.367	0.087	0.525	1.105	0.070	5.721	0.354	0.023	5.504	1.459	0.093	11.226	2.826	0.180	11.751
2017	**34.5**	1.686	0.049	0.120	3.834	0.111	1.963	5.521	0.160	2.083	4.096	0.119	21.233	1.295	0.038	20.088	5.391	0.156	41.321	10.912	0.316	43.404
2018	**39.3**	1.686	0.043	0.120	3.834	0.098	1.963	5.521	0.140	2.083	4.096	0.104	21.233	1.295	0.033	20.088	5.391	0.137	41.321	10.912	0.278	43.404
2019	**37.4**	1.686	0.045	0.120	3.834	0.103	1.963	5.521	0.148	2.083	4.096	0.110	21.233	1.295	0.035	20.088	5.391	0.144	41.321	10.912	0.292	43.404
2020	**35.9**	1.686	0.047	0.120	3.834	0.107	1.963	5.521	0.154	2.083	4.096	0.114	21.233	1.295	0.036	20.088	5.391	0.150	41.321	10.912	0.304	43.404
2021	**34.6**	1.686	0.049	0.120	3.834	0.111	1.963	5.521	0.160	2.083	4.096	0.118	21.233	1.295	0.037	20.088	5.391	0.156	41.321	10.912	0.315	43.404
2022	**33.6**	1.686	0.050	0.120	3.834	0.114	1.963	5.521	0.164	2.083	4.096	0.122	21.233	1.295	0.039	20.088	5.391	0.160	41.321	10.912	0.325	43.404
2023	**29.3**	1.686	0.058	0.120	3.834	0.131	1.963	5.521	0.188	2.083	4.096	0.140	21.233	1.295	0.044	20.088	5.391	0.184	41.321	10.912	0.372	43.404
2024	**25.6**	1.686	0.066	0.120	3.834	0.150	1.963	5.521	0.216	2.083	4.096	0.160	21.233	1.295	0.051	20.088	5.391	0.211	41.321	10.912	0.426	43.404
2025	**22.3**	1.686	0.076	0.120	3.834	0.172	1.963	5.521	0.248	2.083	4.096	0.184	21.233	1.295	0.058	20.088	5.391	0.242	41.321	10.912	0.489	43.404
2026	**19.5**	1.686	0.086	0.120	3.834	0.197	1.963	5.521	0.283	2.083	4.096	0.210	21.233	1.295	0.066	20.088	5.391	0.276	41.321	10.912	0.560	43.404
2027	**17.0**	1.686	0.099	0.120	3.834	0.226	1.963	5.521	0.325	2.083	4.096	0.241	21.233	1.295	0.076	20.088	5.391	0.317	41.321	10.912	0.642	43.404
2028	**13.3**	1.078	0.081	0.077	2.392	0.180	1.219	3.471	0.261	1.295	2.438	0.183	12.651	0.764	0.057	11.832	3.202	0.241	24.483	6.673	0.502	25.778
2029	**11.7**	1.078	0.092	0.077	2.392	0.204	1.219	3.471	0.297	1.295	2.438	0.208	12.651	0.764	0.065	11.832	3.202	0.274	24.483	6.673	0.570	25.778
2030	**10.3**	1.078	0.105	0.077	2.392	0.232	1.219	3.471	0.337	1.295	2.438	0.237	12.651	0.764	0.074	11.832	3.202	0.311	24.483	6.673	0.648	25.778
2031	**9.1**	1.078	0.119	0.056	2.392	0.263	0.973	3.471	0.381	1.030	2.438	0.268	10.951	0.764	0.084	10.585	3.202	0.352	21.536	6.673	0.733	22.565
2032	**8.0**	1.078	0.135	0.077	2.392	0.299	1.219	3.471	0.434	1.295	2.438	0.305	12.651	0.764	0.096	11.832	3.202	0.400	24.483	6.673	0.834	25.778
2033	**7.0**	1.078	0.154	0.077	2.392	0.342	1.219	3.471	0.496	1.295	2.438	0.348	12.651	0.764	0.109	11.832	3.202	0.457	24.483	6.673	0.953	25.778
2034	**6.2**	1.078	0.174	0.077	2.392	0.386	1.219	3.471	0.560	1.295	2.438	0.393	12.651	0.764	0.123	11.832	3.20	0.52	24.48	6.673	1.076	25.778
2035	**5.4**	1.078	0.200	0.077	2.392	0.443	1.219	3.471	0.643	1.295	2.438	0.451	12.651	0.764	0.142	11.832	3.20	0.59	24.48	6.673	1.236	25.778
2036		0.196		0.014	0.469		0.242	0.664		0.256	0.521		2.697	0.168		2.611	0.69		5.31	1.353		5.563
2037		0.196		0.014	0.469		0.242	0.664		0.256	0.521		2.697	0.168		2.611	0.69		5.31	1.353		5.563
2038		0.196		0.014	0.469		0.242	0.664		0.256	0.521		2.697	0.168		2.611	0.69		5.31	1.353		5.563
Total LOF	**455.0**	**29.386**		**2**	**66.568**		**34**	**95.954**		**36**	**70.544**		**364**	**22.283**		**344**	**92.827**		**708**	**188.781**		**744**
Average LOF		**0.918**	**0.065**	**0**	**2.080**	**0.146**	**1**	**2.999**	**0.211**	**1**	**2.204**	**0.155**	**11**	**0.696**	**0.049**	**11**	**2.901**	**0.204**	**22**	**5.899**	**0.415**	**23**

Table 4.2.3
Arctic Spill Occurrence - Sale 2 - Platforms

Year	Water Depth	N Platforms	N P Wells	Small and Medium Spills 50-999 bbl			Large and Huge Spills =>1000 bbl		
				Expected Spill [bbl] =		**452**	Expected Spill [bbl] =		**5631**
		Cum.	Cum.	Frequency spills per 10^4well-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4well-year	Frequency spills per 10^3years	Spill Index bbl
2004	Shallow			1.619			0.274		
	Medium			1.704			0.288		
	Deep			1.828			0.309		
	Total								
2005	Shallow			1.619			0.274		
	Medium			1.704			0.288		
	Deep			1.828			0.309		
	Total								
2006	Shallow			1.619			0.274		
	Medium			1.704			0.288		
	Deep			1.828			0.309		
	Total								
2007	Shallow			1.619			0.274		
	Medium			1.704			0.288		
	Deep			1.828			0.309		
	Total								
2008	Shallow			1.619			0.274		
	Medium			1.704			0.288		
	Deep			1.828			0.309		
	Total								
2009	Shallow			1.619			0.274		
	Medium			1.704			0.288		
	Deep			1.828			0.309		
	Total								
2010	Shallow			1.619			0.274		
	Medium			1.704			0.288		
	Deep			1.828			0.309		
	Total								
2011	Shallow			1.619			0.274		
	Medium			1.704			0.288		
	Deep			1.828			0.309		
	Total								
2012	Shallow	1	3	1.619	0.486	0.22	0.274	0.082	0.46
	Medium			1.704			0.288		
	Deep			1.828			0.309		
	Total	**1**	**3**		**0.486**	**0.22**		**0.082**	**0.46**
2013	Shallow	1	13	1.619	2.105	0.95	0.274	0.357	2.01
	Medium			1.704			0.288		
	Deep			1.828			0.309		
	Total	**1**	**13**		**2.105**	**0.95**		**0.357**	**2.01**
2014	Shallow	1	23	1.619	3.724	1.68	0.274	0.631	3.55
	Medium			1.704			0.288		
	Deep			1.828			0.309		
	Total	**1**	**23**		**3.724**	**1.68**		**0.631**	**3.55**
2015	Shallow	1	23	1.619	3.724	1.68	0.274	0.631	3.55
	Medium			1.704			0.288		
	Deep			1.828			0.309		
	Total	**1**	**23**		**3.724**	**1.68**		**0.631**	**3.55**
2016	Shallow	1	23	1.619	3.724	1.68	0.274	0.631	3.55
	Medium	1	3	1.704	0.511	0.23	0.288	0.087	0.49
	Deep			1.828			0.309		
	Total	**2**	**26**		**4.235**	**1.91**		**0.717**	**4.04**
2017	Shallow	1	23	1.619	3.724	1.68	0.274	0.631	3.55
	Medium	2	16	1.704	2.726	1.23	0.288	0.461	2.60
	Deep			1.828			0.309		
	Total	**3**	**39**		**6.450**	**2.91**		**1.092**	**6.15**
2018	Shallow	1	23	1.619	3.724	1.68	0.274	0.631	3.55
	Medium	2	36	1.704	6.133	2.77	0.288	1.038	5.85
	Deep			1.828			0.309		
	Total	**3**	**59**		**9.857**	**4.45**		**1.669**	**9.40**
2019	Shallow	1	23	1.619	3.724	1.68	0.274	0.631	3.55
	Medium	2	46	1.704	7.837	3.54	0.288	1.326	7.47
	Deep			1.828			0.309		
	Total	**3**	**69**		**11.561**	**5.22**		**1.957**	**11.02**
2020	Shallow	1	23	1.619	3.724	1.68	0.274	0.631	3.55
	Medium	2	46	1.704	7.837	3.54	0.288	1.326	7.47
	Deep			1.828			0.309		
	Total	**3**	**69**		**11.561**	**5.22**		**1.957**	**11.02**
2021	Shallow	1	23	1.619	3.724	1.68	0.274	0.631	3.55
	Medium	2	46	1.704	7.837	3.54	0.288	1.326	7.47
	Deep			1.828			0.309		
	Total	**3**	**69**		**11.561**	**5.22**		**1.957**	**11.02**
2022	Shallow	1	23	1.619	3.724	1.68	0.274	0.631	3.55
	Medium	2	46	1.704	7.837	3.54	0.288	1.326	7.47
	Deep			1.828			0.309		
	Total	**3**	**69**		**11.561**	**5.22**		**1.957**	**11.02**
2023	Shallow	1	23	1.619	3.724	1.68	0.274	0.631	3.55
	Medium	2	46	1.704	7.837	3.54	0.288	1.326	7.47
	Deep			1.828			0.309		
	Total	**3**	**69**		**11.561**	**5.22**		**1.957**	**11.02**
2024	Shallow	1	23	1.619	3.724	1.68	0.274	0.631	3.55
	Medium	2	46	1.704	7.837	3.54	0.288	1.326	7.47

Table 4.2.3
Arctic Spill Occurrence - Sale 2 - Platforms

Year	Water Depth	N Platforms	N P Wells	Small and Medium Spills 50-999 bbl			Large and Huge Spills =>1000 bbl		
				Expected Spill [bbl] =		**452**	Expected Spill [bbl] =		**5631**
		Cum.	Cum.	Frequency spills per 10^4well-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4well-year	Frequency spills per 10^3years	Spill Index bbl
2024	Deep			1.828			0.309		
	Total	**3**	**69**		**11.561**	**5.22**		**1.957**	**11.02**
2025	Shallow	1	23	1.619	3.724	1.68	0.274	0.631	3.55
	Medium	2	46	1.704	7.837	3.54	0.288	1.326	7.47
	Deep			1.828			0.309		
	Total	**3**	**69**		**11.561**	**5.22**		**1.957**	**11.02**
2026	Shallow	1	23	1.619	3.724	1.68	0.274	0.631	3.55
	Medium	2	46	1.704	7.837	3.54	0.288	1.326	7.47
	Deep			1.828			0.309		
	Total	**3**	**69**		**11.561**	**5.22**		**1.957**	**11.02**
2027	Shallow	1	23	1.619	3.724	1.68	0.274	0.631	3.55
	Medium	2	46	1.704	7.837	3.54	0.288	1.326	7.47
	Deep			1.828			0.309		
	Total	**3**	**69**		**11.561**	**5.22**		**1.957**	**11.02**
2028	Shallow			1.619			0.274		
	Medium	2	46	1.704	7.837	3.54	0.288	1.326	7.47
	Deep			1.828			0.309		
	Total	**2**	**46**		**7.837**	**3.54**		**1.326**	**7.47**
2029	Shallow			1.619			0.274		
	Medium	2	46	1.704	7.837	3.54	0.288	1.326	7.47
	Deep			1.828			0.309		
	Total	**2**	**46**		**7.837**	**3.54**		**1.326**	**7.47**
2030	Shallow			1.619			0.274		
	Medium	2	46	1.704	7.837	3.54	0.288	1.326	7.47
	Deep			1.828			0.309		
	Total	**2**	**46**		**7.837**	**3.54**		**1.326**	**7.47**
2031	Shallow			1.619			0.274		
	Medium	2	46	1.704	7.837	3.54	0.288	1.326	7.47
	Deep			1.828			0.309		
	Total	**2**	**46**		**7.837**	**3.54**		**1.326**	**7.47**
2032	Shallow			1.619			0.274		
	Medium	2	46	1.704	7.837	3.54	0.288	1.326	7.47
	Deep			1.828			0.309		
	Total	**2**	**46**		**7.837**	**3.54**		**1.326**	**7.47**
2033	Shallow			1.619			0.274		
	Medium	2	46	1.704	7.837	3.54	0.288	1.326	7.47
	Deep			1.828			0.309		
	Total	**2**	**46**		**7.837**	**3.54**		**1.326**	**7.47**
2034	Shallow			1.619			0.274		
	Medium	2	46	1.704	7.837	3.54	0.288	1.326	7.47
	Deep			1.828			0.309		
	Total	**2**	**46**		**7.837**	**3.54**		**1.326**	**7.47**
2035	Shallow			1.619			0.274		
	Medium	2	46	1.704	7.837	3.54	0.288	1.326	7.47
	Deep			1.828			0.309		
	Total	**2**	**46**		**7.837**	**3.54**		**1.326**	**7.47**
2036	Shallow			1.619			0.274		
	Medium			1.704			0.288		
	Deep			1.828			0.309		
	Total								
2037	Shallow			1.619			0.274		
	Medium			1.704			0.288		
	Deep			1.828			0.309		
	Total								
2038	Shallow			1.619			0.274		
	Medium			1.704			0.288		
	Deep			1.828			0.309		
	Total								

Table 4.2.4
Arctic Spill Occurrence - Sale 2 - Platforms - Summary

Year	Production [MMbbl]	Small and Medium Spills 50-999 bbl			Large and Huge Spills =>1000 bbl			Significant Spills =>1000 bbl			All Spills		
		Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 103years	Frequency Spills per 109 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]
2004													
2005													
2006													
2007													
2008													
2009													
2010													
2011													
2012		0.486		0.220	0.082		0.463	0.082		0.463	0.568		0.683
2013	**7.9**	2.105	0.266	0.951	0.357	0.045	2.008	0.357	0.045	2.008	2.461	0.312	2.959
2014	**15.7**	3.724	0.237	1.683	0.631	0.040	3.553	0.631	0.040	3.553	4.355	0.277	5.235
2015	**15.7**	3.724	0.237	1.683	0.631	0.040	3.553	0.631	0.040	3.553	4.355	0.277	5.235
2016	**15.7**	4.235	0.270	1.914	0.717	0.046	4.040	0.717	0.046	4.040	4.952	0.315	5.954
2017	**34.5**	6.450	0.187	2.915	1.092	0.032	6.150	1.092	0.032	6.150	7.542	0.219	9.065
2018	**39.3**	9.857	0.251	4.455	1.669	0.042	9.398	1.669	0.042	9.398	11.526	0.293	13.852
2019	**37.4**	11.561	0.309	5.225	1.957	0.052	11.021	1.957	0.052	11.021	13.518	0.361	16.246
2020	**35.9**	11.561	0.322	5.225	1.957	0.055	11.021	1.957	0.055	11.021	13.518	0.377	16.246
2021	**34.6**	11.561	0.334	5.225	1.957	0.057	11.021	1.957	0.057	11.021	13.518	0.391	16.246
2022	**33.6**	11.561	0.344	5.225	1.957	0.058	11.021	1.957	0.058	11.021	13.518	0.402	16.246
2023	**29.3**	11.561	0.395	5.225	1.957	0.067	11.021	1.957	0.067	11.021	13.518	0.461	16.246
2024	**25.6**	11.561	0.452	5.225	1.957	0.076	11.021	1.957	0.076	11.021	13.518	0.528	16.246
2025	**22.3**	11.561	0.518	5.225	1.957	0.088	11.021	1.957	0.088	11.021	13.518	0.606	16.246
2026	**19.5**	11.561	0.593	5.225	1.957	0.100	11.021	1.957	0.100	11.021	13.518	0.693	16.246
2027	**17.0**	11.561	0.680	5.225	1.957	0.115	11.021	1.957	0.115	11.021	13.518	0.795	16.246
2028	**13.3**	7.837	0.589	3.542	1.326	0.100	7.469	1.326	0.100	7.469	9.163	0.689	11.010
2029	**11.7**	7.837	0.670	3.542	1.326	0.113	7.469	1.326	0.113	7.469	9.163	0.783	11.010
2030	**10.3**	7.837	0.761	3.542	1.326	0.129	7.469	1.326	0.129	7.469	9.163	0.890	11.010
2031	**9.1**	7.837	0.861	3.542	1.326	0.146	7.469	1.326	0.146	7.469	9.163	1.007	11.010
2032	**8.0**	7.837	0.980	3.542	1.326	0.166	7.469	1.326	0.166	7.469	9.163	1.145	11.010
2033	**7.0**	7.837	1.120	3.542	1.326	0.189	7.469	1.326	0.189	7.469	9.163	1.309	11.010
2034	**6.2**	7.837	1.264	3.542	1.326	0.214	7.469	9.16	1.48	11.01	9.163	1.478	11.010
2035	**5.4**	7.837	1.451	3.542	1.326	0.246	7.469	9.16	1.70	11.01	9.163	1.697	11.010
2036													
2037													
2038													
Total LOF	**455.0**	**197.323**		**89**	**33.406**		**188**	**49.079**		**195**	**230.729**		**277**
Average LOF		**6.166**	**0.434**	**3**	**1.044**	**0.073**	**6**	**1.534**	**0.108**	**6**	**7.210**	**0.507**	**9**

Table 4.2.5
Arctic Spill Occurrence - Sale 2 - Production Wells

Year	Water Depth	Production Wells Blowout												
		N Wells	Small and Medium Spills 50-999 bbl			Large Spills 1000-9999 bbl			Spills 10000-149999 bbl			Spills =>150000 bbl		
			Expected Spill [bbl] =		**519**	Expected Spill [bbl] =		**5292**	Expected Spill [bbl] =		**68349**	Expected Spill [bbl] =		**200000**
		Cum.	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl
2004	Shallow		0.103			0.718			0.308			0.205		
	Medium		0.103			0.718			0.308			0.205		
	Deep		0.103			0.718			0.308			0.205		
	Total													
2005	Shallow		0.103			0.718			0.308			0.205		
	Medium		0.103			0.718			0.308			0.205		
	Deep		0.103			0.718			0.308			0.205		
	Total													
2006	Shallow		0.103			0.718			0.308			0.205		
	Medium		0.103			0.718			0.308			0.205		
	Deep		0.103			0.718			0.308			0.205		
	Total													
2007	Shallow		0.103			0.718			0.308			0.205		
	Medium		0.103			0.718			0.308			0.205		
	Deep		0.103			0.718			0.308			0.205		
	Total													
2008	Shallow		0.103			0.718			0.308			0.205		
	Medium		0.103			0.718			0.308			0.205		
	Deep		0.103			0.718			0.308			0.205		
	Total													
2009	Shallow		0.103			0.718			0.308			0.205		
	Medium		0.103			0.718			0.308			0.205		
	Deep		0.103			0.718			0.308			0.205		
	Total													
2010	Shallow		0.103			0.718			0.308			0.205		
	Medium		0.103			0.718			0.308			0.205		
	Deep		0.103			0.718			0.308			0.205		
	Total													
2011	Shallow		0.103			0.718			0.308			0.205		
	Medium		0.103			0.718			0.308			0.205		
	Deep		0.103			0.718			0.308			0.205		
	Total													
2012	Shallow	3	0.103	0.031	0.02	0.718	0.215	1.14	0.308	0.092	6.31	0.205	0.062	12.31
	Medium		0.103			0.718			0.308			0.205		
	Deep		0.103			0.718			0.308			0.205		
	Total	**3**		0.031	**0.02**		0.215	**1.14**		0.092	**6.31**		0.062	**12.31**
2013	Shallow	13	0.103	0.133	0.07	0.718	0.934	4.94	0.308	0.400	27.35	0.205	0.267	53.36
	Medium		0.103			0.718			0.308			0.205		
	Deep		0.103			0.718			0.308			0.205		
	Total	**13**		0.133	**0.07**		0.934	**4.94**		0.400	**27.35**		0.267	**53.36**
2014	Shallow	23	0.103	0.236	0.12	0.718	1.652	8.74	0.308	0.708	48.39	0.205	0.472	94.40
	Medium		0.103			0.718			0.308			0.205		
	Deep		0.103			0.718			0.308			0.205		
	Total	**23**		0.236	**0.12**		1.652	**8.74**		0.708	**48.39**		0.472	**94.40**
2015	Shallow	23	0.103	0.236	0.12	0.718	1.652	8.74	0.308	0.708	48.39	0.205	0.472	94.40
	Medium		0.103			0.718			0.308			0.205		
	Deep		0.103			0.718			0.308			0.205		
	Total	**23**		0.236	**0.12**		1.652	**8.74**		0.708	**48.39**		0.472	**94.40**
2016	Shallow	23	0.103	0.236	0.12	0.718	1.652	8.74	0.308	0.708	48.39	0.205	0.472	94.40
	Medium	3	0.103	0.031	0.02	0.718	0.215	1.14	0.308	0.092	6.31	0.205	0.062	12.31
	Deep		0.103			0.718			0.308			0.205		
	Total	**26**		0.267	**0.14**		1.868	**9.88**		0.800	**54.71**		0.534	**106.72**
2017	Shallow	23	0.103	0.236	0.12	0.718	1.652	8.74	0.308	0.708	48.39	0.205	0.472	94.40
	Medium	16	0.103	0.164	0.09	0.718	1.149	6.08	0.308	0.493	33.66	0.205	0.328	65.67
	Deep		0.103			0.718			0.308			0.205		
	Total	**39**		0.400	**0.21**		2.801	**14.83**		1.201	**82.06**		0.800	**160.08**
2018	Shallow	23	0.103	0.236	0.12	0.718	1.652	8.74	0.308	0.708	48.39	0.205	0.472	94.40
	Medium	36	0.103	0.369	0.19	0.718	2.586	13.68	0.308	1.108	75.75	0.205	0.739	147.76
	Deep		0.103			0.718			0.308			0.205		
	Total	**59**		0.605	**0.31**		4.238	**22.43**		1.816	**124.14**		1.211	**242.17**
2019	Shallow	23	0.103	0.236	0.12	0.718	1.652	8.74	0.308	0.708	48.39	0.205	0.472	94.40
	Medium	46	0.103	0.472	0.25	0.718	3.304	17.49	0.308	1.416	96.79	0.205	0.944	188.81
	Deep		0.103			0.718			0.308			0.205		
	Total	**69**		0.708	**0.37**		4.956	**26.23**		2.124	**145.18**		1.416	**283.21**
2020	Shallow	23	0.103	0.236	0.12	0.718	1.652	8.74	0.308	0.708	48.39	0.205	0.472	94.40
	Medium	46	0.103	0.472	0.25	0.718	3.304	17.49	0.308	1.416	96.79	0.205	0.944	188.81
	Deep		0.103			0.718			0.308			0.205		
	Total	**69**		0.708	**0.37**		4.956	**26.23**		2.124	**145.18**		1.416	**283.21**
2021	Shallow	23	0.103	0.236	0.12	0.718	1.652	8.74	0.308	0.708	48.39	0.205	0.472	94.40
	Medium	46	0.103	0.472	0.25	0.718	3.304	17.49	0.308	1.416	96.79	0.205	0.944	188.81
	Deep		0.103			0.718			0.308			0.205		
	Total	**69**		0.708	**0.37**		4.956	**26.23**		2.124	**145.18**		1.416	**283.21**

Table 4.2.5
Arctic Spill Occurrence - Sale 2 - Production Wells

Year	Water Depth	Production Wells Blowout												
		N Wells	Small and Medium Spills 50-999 bbl			Large Spills 1000-9999 bbl			Spills 10000-149999 bbl			Spills =>150000 bbl		
			Expected Spill [bbl] =		**519**	Expected Spill [bbl] =		**5292**	Expected Spill [bbl] =		**68349**	Expected Spill [bbl] =		**200000**
		Cum.	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl
2022	Shallow	23	0.103	0.236	0.12	0.718	1.652	8.74	0.308	0.708	48.39	0.205	0.472	94.40
	Medium	46	0.103	0.472	0.25	0.718	3.304	17.49	0.308	1.416	96.79	0.205	0.944	188.81
	Deep		0.103			0.718			0.308			0.205		
	Total	**69**		0.708	**0.37**		4.956	**26.23**		2.124	**145.18**		1.416	**283.21**
2023	Shallow	23	0.103	0.236	0.12	0.718	1.652	8.74	0.308	0.708	48.39	0.205	0.472	94.40
	Medium	46	0.103	0.472	0.25	0.718	3.304	17.49	0.308	1.416	96.79	0.205	0.944	188.81
	Deep		0.103			0.718			0.308			0.205		
	Total	**69**		0.708	**0.37**		4.956	**26.23**		2.124	**145.18**		1.416	**283.21**
2024	Shallow	23	0.103	0.236	0.12	0.718	1.652	8.74	0.308	0.708	48.39	0.205	0.472	94.40
	Medium	46	0.103	0.472	0.25	0.718	3.304	17.49	0.308	1.416	96.79	0.205	0.944	188.81
	Deep		0.103			0.718			0.308			0.205		
	Total	**69**		0.708	**0.37**		4.956	**26.23**		2.124	**145.18**		1.416	**283.21**
2025	Shallow	23	0.103	0.236	0.12	0.718	1.652	8.74	0.308	0.708	48.39	0.205	0.472	94.40
	Medium	46	0.103	0.472	0.25	0.718	3.304	17.49	0.308	1.416	96.79	0.205	0.944	188.81
	Deep		0.103			0.718			0.308			0.205		
	Total	**69**		0.708	**0.37**		4.956	**26.23**		2.124	**145.18**		1.416	**283.21**
2026	Shallow	23	0.103	0.236	0.12	0.718	1.652	8.74	0.308	0.708	48.39	0.205	0.472	94.40
	Medium	46	0.103	0.472	0.25	0.718	3.304	17.49	0.308	1.416	96.79	0.205	0.944	188.81
	Deep		0.103			0.718			0.308			0.205		
	Total	**69**		0.708	**0.37**		4.956	**26.23**		2.124	**145.18**		1.416	**283.21**
2027	Shallow	23	0.103	0.236	0.12	0.718	1.652	8.74	0.308	0.708	48.39	0.205	0.472	94.40
	Medium	46	0.103	0.472	0.25	0.718	3.304	17.49	0.308	1.416	96.79	0.205	0.944	188.81
	Deep		0.103			0.718			0.308			0.205		
	Total	**69**		0.708	**0.37**		4.956	**26.23**		2.124	**145.18**		1.416	**283.21**
2028	Shallow		0.103			0.718			0.308			0.205		
	Medium	46	0.103	0.472	0.25	0.718	3.304	17.49	0.308	1.416	96.79	0.205	0.944	188.81
	Deep		0.103			0.718			0.308			0.205		
	Total	**46**		0.472	**0.25**		3.304	**17.49**		1.416	**96.79**		0.944	**188.81**
2029	Shallow		0.103			0.718			0.308			0.205		
	Medium	46	0.103	0.472	0.25	0.718	3.304	17.49	0.308	1.416	96.79	0.205	0.944	188.81
	Deep		0.103			0.718			0.308			0.205		
	Total	**46**		0.472	**0.25**		3.304	**17.49**		1.416	**96.79**		0.944	**188.81**
2030	Shallow		0.103			0.718			0.308			0.205		
	Medium	46	0.103	0.472	0.25	0.718	3.304	17.49	0.308	1.416	96.79	0.205	0.944	188.81
	Deep		0.103			0.718			0.308			0.205		
	Total	**46**		0.472	**0.25**		3.304	**17.49**		1.416	**96.79**		0.944	**188.81**
2031	Shallow		0.103			0.718			0.308			0.205		
	Medium	46	0.103	0.472	0.25	0.718	3.304	17.49	0.308	1.416	96.79	0.205	0.944	188.81
	Deep		0.103			0.718			0.308			0.205		
	Total	**46**		0.472	**0.25**		3.304	**17.49**		1.416	**96.79**		0.944	**188.81**
2032	Shallow		0.103			0.718			0.308			0.205		
	Medium	46	0.103	0.472	0.25	0.718	3.304	17.49	0.308	1.416	96.79	0.205	0.944	188.81
	Deep		0.103			0.718			0.308			0.205		
	Total	**46**		0.472	**0.25**		3.304	**17.49**		1.416	**96.79**		0.944	**188.81**
2033	Shallow		0.103			0.718			0.308			0.205		
	Medium	46	0.103	0.472	0.25	0.718	3.304	17.49	0.308	1.416	96.79	0.205	0.944	188.81
	Deep		0.103			0.718			0.308			0.205		
	Total	**46**		0.472	**0.25**		3.304	**17.49**		1.416	**96.79**		0.944	**188.81**
2034	Shallow		0.103			0.718			0.308			0.205		
	Medium	46	0.103	0.472	0.25	0.718	3.304	17.49	0.308	1.416	96.79	0.205	0.944	188.81
	Deep		0.103			0.718			0.308			0.205		
	Total	**46**		0.472	**0.25**		3.304	**17.49**		1.416	**96.79**		0.944	**188.81**
2035	Shallow		0.103			0.718			0.308			0.205		
	Medium	46	0.103	0.472	0.25	0.718	3.304	17.49	0.308	1.416	96.79	0.205	0.944	188.81
	Deep		0.103			0.718			0.308			0.205		
	Total	**46**		0.472	**0.25**		3.304	**17.49**		1.416	**96.79**		0.944	**188.81**
2036	Shallow		0.103			0.718			0.308			0.205		
	Medium		0.103			0.718			0.308			0.205		
	Deep		0.103			0.718			0.308			0.205		
	Total													
2037	Shallow		0.103			0.718			0.308			0.205		
	Medium		0.103			0.718			0.308			0.205		
	Deep		0.103			0.718			0.308			0.205		
	Total													
2038	Shallow		0.103			0.718			0.308			0.205		
	Medium		0.103			0.718			0.308			0.205		
	Deep		0.103			0.718			0.308			0.205		
	Total													

Table 4.2.6
Arctic Spill Occurrence - Sale 2 - Production Wells - Summary

Year	Production [MMbbl]	Small and Medium Spills 50-99 bbl			Large Spills 1000-9999 bbl			Huge Spills =>10000 bbl			All Spills		
		Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]
2004													
2005													
2006													
2007													
2008													
2009													
2010													
2011													
2012		0.031		0.016	0.092		1.140	0.154		18.626	0.277		19.782
2013	**7.9**	0.133	0.017	0.069	0.400	0.051	4.942	0.667	0.084	80.712	1.201	0.152	85.723
2014	**15.7**	0.236	0.015	0.123	0.708	0.045	8.743	1.180	0.075	142.797	2.124	0.135	151.663
2015	**15.7**	0.236	0.015	0.123	0.708	0.045	8.743	1.180	0.075	142.797	2.124	0.135	151.663
2016	**15.7**	0.267	0.017	0.139	0.800	0.051	9.883	1.334	0.085	161.423	2.401	0.153	171.445
2017	**34.5**	0.400	0.012	0.208	1.201	0.035	14.825	2.001	0.058	242.135	3.602	0.104	257.168
2018	**39.3**	0.605	0.015	0.314	1.816	0.046	22.428	3.027	0.077	366.307	5.449	0.139	389.049
2019	**37.4**	0.708	0.019	0.368	2.124	0.057	26.229	3.540	0.095	428.392	6.372	0.170	454.989
2020	**35.9**	0.708	0.020	0.368	2.124	0.059	26.229	3.540	0.099	428.392	6.372	0.178	454.989
2021	**34.6**	0.708	0.020	0.368	2.124	0.061	26.229	3.540	0.102	428.392	6.372	0.184	454.989
2022	**33.6**	0.708	0.021	0.368	2.124	0.063	26.229	3.540	0.105	428.392	6.372	0.190	454.989
2023	**29.3**	0.708	0.024	0.368	2.124	0.072	26.229	3.540	0.121	428.392	6.372	0.217	454.989
2024	**25.6**	0.708	0.028	0.368	2.124	0.083	26.229	3.540	0.138	428.392	6.372	0.249	454.989
2025	**22.3**	0.708	0.032	0.368	2.124	0.095	26.229	3.540	0.159	428.392	6.372	0.286	454.989
2026	**19.5**	0.708	0.036	0.368	2.124	0.109	26.229	3.540	0.182	428.392	6.372	0.327	454.989
2027	**17.0**	0.708	0.042	0.368	2.124	0.125	26.229	3.540	0.208	428.392	6.372	0.375	454.989
2028	**13.3**	0.472	0.035	0.245	1.416	0.106	17.486	2.360	0.177	285.595	4.248	0.319	303.326
2029	**11.7**	0.472	0.040	0.245	1.416	0.121	17.486	2.360	0.202	285.595	4.248	0.363	303.326
2030	**10.3**	0.472	0.046	0.245	1.416	0.137	17.486	2.360	0.229	285.595	4.248	0.412	303.326
2031	**9.1**	0.472	0.052	0.245	1.416	0.156	17.486	2.360	0.259	285.595	4.248	0.467	303.326
2032	**8.0**	0.472	0.059	0.245	1.416	0.177	17.486	2.360	0.295	285.595	4.248	0.531	303.326
2033	**7.0**	0.472	0.067	0.245	1.416	0.202	17.486	2.360	0.337	285.595	4.248	0.607	303.326
2034	**6.2**	0.472	0.076	0.245	1.416	0.228	17.486	2.360	0.381	285.595	4.248	0.685	303.326
2035	**5.4**	0.472	0.087	0.245	1.416	0.262	17.486	2.360	0.437	285.595	4.248	0.787	303.326
2036													
2037													
2038													

Table 4.2.7
Occurrence Spill Risks - Sale 2 - Exploration Wells

Year	Water Depth	Exploration Wells Blowout												
		N Wells	Small and Medium Spills 50-999 bbl			Large Spills 1000-9999 bbl			Spills 10000-149999 bbl			Spills =>150000 bbl		
			Expected Spill [bbl] =		519	Expected Spill [bbl] =		5292	Expected Spill [bbl] =		68349	Expected Spill [bbl] =		200000
		Cum.	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl
2004	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2005	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2006	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2007	Shallow	1	1.583	0.158	0.08	11.077	1.108	5.86	4.759	0.476	32.53	2.755	0.276	55.11
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total	**1**		0.158	**0.08**		1.108	**5.86**		0.476	**32.53**		0.276	**55.11**
2008	Shallow	1	1.583	0.158	0.08	11.077	1.108	5.86	4.759	0.476	32.53	2.755	0.276	55.11
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total	**1**		0.158	**0.08**		1.108	**5.86**		0.476	**32.53**		0.276	**55.11**
2009	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2010	Shallow		1.583			11.077			4.759			2.755		
	Medium	1	1.809	0.181	0.09	12.659	1.266	6.70	5.439	0.544	37.18	3.149	0.315	62.98
	Deep		2.035			14.242			6.119			3.543		
	Total	**1**		0.181	**0.09**		1.266	**6.70**		0.544	**37.18**		0.315	**62.98**
2011	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2012	Shallow		1.583			11.077			4.759			2.755		
	Medium	1	1.809	0.181	0.09	12.659	1.266	6.70	5.439	0.544	37.18	3.149	0.315	62.98
	Deep	1	2.035	0.204	0.11	14.242	1.424	7.54	6.119	0.612	41.82	3.543	0.354	70.85
	Total	**2**		0.384	**0.20**		2.690	**14.24**		1.156	**79.00**		0.669	**133.84**
2013	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep	1	2.035	0.204	0.11	14.242	1.424	7.54	6.119	0.612	41.82	3.543	0.354	70.85
	Total	**1**		0.204	**0.11**		1.424	**7.54**		0.612	**41.82**		0.354	**70.85**
2014	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2015	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2016	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2017	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2018	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2019	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2020	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2021	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2022	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2023	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2024	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2025	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2026	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2027	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2028	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2029	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													

Table 4.2.7
Occurrence Spill Risks - Sale 2 - Exploration Wells

Year	Water Depth	Exploration Wells Blowout												
		N Wells	Small and Medium Spills 50-999 bbl			Large Spills 1000-9999 bbl			Spills 10000-149999 bbl			Spills =>150000 bbl		
			Expected Spill [bbl] =		**519**	Expected Spill [bbl] =		**5292**	Expected Spill [bbl] =		**68349**	Expected Spill [bbl] =		**200000**
		Cum.	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl
2030	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2031	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2032	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2033	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2034	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2035	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2036	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2037	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2038	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													

Table 4.2.8
Arctic Spill Occurrence - Sale 2 - Exploration Wells - Summary

Year	Production [MMbbl]	Small and Medium Spills 50-99 bbl			Large Spills 1000-9999 bbl			Huge Spills =>10000 bbl			All Spills		
		Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]
2004													
2005													
2006													
2007		0.158		0.082	0.476		5.862	0.751		87.639	1.386		93.583
2008		0.158		0.082	0.476		5.862	0.751		87.639	1.386		93.583
2009													
2010		0.181		0.094	0.544		6.699	0.859		100.159	1.584		106.952
2011													
2012		0.384		0.200	1.156		14.236	1.825		212.838	3.365		227.274
2013	**7.9**	0.204	0.026	0.106	0.612	0.077	7.537	0.966	0.122	112.679	1.782	0.226	120.321
2014	**15.7**												
2015	**15.7**												
2016	**15.7**												
2017	**34.5**												
2018	**39.3**												
2019	**37.4**												
2020	**35.9**												
2021	**34.6**												
2022	**33.6**												
2023	**29.3**												
2024	**25.6**												
2025	**22.3**												
2026	**19.5**												
2027	**17.0**												
2028	**13.3**												
2029	**11.7**												
2030	**10.3**												
2031	**9.1**												
2032	**8.0**												
2033	**7.0**												
2034	**6.2**												
2035	**5.4**												
2036													
2037													
2038													

Table 4.2.9
Arctic Spill Occurrence Beaufort Sea Sale 2 Development Wells

Year	Water Depth	Development Wells Blowout												
		N Wells	Small and Medium Spills 50-999 bbl			Large Spills 1000-9999 bbl			Spills 10000-149999 bbl			Spills =>150000 bbl		
			Expected Spill [bbl] =		**519**	Expected Spill [bbl] =		**5292**	Expected Spill [bbl] =		**68349**	Expected Spill [bbl] =		**200000**
		Cum.	Frequency spills per 10^4well-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4well-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4well-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4well-year	Frequency spills per 10^3years	Spill Index bbl
2004	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2005	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2006	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2007	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2008	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2009	Shallow	2	0.484	0.097	0.05	3.383	0.677	3.58	1.453	0.291	19.87	1.453	0.291	58.13
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total	**2**		0.097	**0.05**		0.677	**3.58**		0.291	**19.87**		0.291	**58.13**
2010	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2011	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2012	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2013	Shallow		0.484			3.383			1.453			1.453		
	Medium	2	0.554	0.111	0.06	3.867	0.773	4.09	1.661	0.332	22.70	1.661	0.332	66.43
	Deep		0.623			4.350			1.868			1.868		
	Total	**2**		0.111	**0.06**		0.773	**4.09**		0.332	**22.70**		0.332	**66.43**
2014	Shallow		0.484			3.383			1.453			1.453		
	Medium	2	0.554	0.111	0.06	3.867	0.773	4.09	1.661	0.332	22.70	1.661	0.332	66.43
	Deep		0.623			4.350			1.868			1.868		
	Total	**2**		0.111	**0.06**		0.773	**4.09**		0.332	**22.70**		0.332	**66.43**
2015	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2016	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2017	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2018	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2019	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2020	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2021	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2022	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2023	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2024	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2025	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2026	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2027	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2028	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2029	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													

Table 4.2.9
Arctic Spill Occurrence Beaufort Sea Sale 2 Development Wells

Year	Water Depth	Development Wells Blowout												
		N Wells	Small and Medium Spills 50-999 bbl			Large Spills 1000-9999 bbl			Spills 10000-149999 bbl			Spills =>150000 bbl		
			Expected Spill [bbl] =		519	Expected Spill [bbl] =		5292	Expected Spill [bbl] =		68349	Expected Spill [bbl] =		200000
		Cum.	Frequency spills per 10^4well-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4well-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4well-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4well-year	Frequency spills per 10^3years	Spill Index bbl
2030	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2031	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2032	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2033	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2034	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2035	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2036	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2037	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2038	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													

Table 4.2.10
Arctic Spill Occurrence - Sale 2 - Development Wells - Summary

Year	Production [MMbbl]	Small and Medium Spills 50-99 bbl			Large Spills 1000-9999 bbl			Huge Spills =>10000 bbl			All Spills		
		Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]
2004													
2005													
2006													
2007													
2008													
2009		0.097		0.050	0.291		3.581	0.581		77.994	0.969		81.626
2010													
2011													
2012													
2013	**7.9**	0.111	0.014	0.058	0.332	0.042	4.093	0.664	0.084	89.136	1.107	0.140	93.287
2014	**15.7**	0.111	0.007	0.058	0.332	0.021	4.093	0.664	0.042	89.136	1.107	0.071	93.287
2015	**15.7**												
2016	**15.7**												
2017	**34.5**												
2018	**39.3**												
2019	**37.4**												
2020	**35.9**												
2021	**34.6**												
2022	**33.6**												
2023	**29.3**												
2024	**25.6**												
2025	**22.3**												
2026	**19.5**												
2027	**17.0**												
2028	**13.3**												
2029	**11.7**												
2030	**10.3**												
2031	**9.1**												
2032	**8.0**												
2033	**7.0**												
2034	**6.2**												
2035	**5.4**												
2036													
2037													
2038													

Table 4.2.11
Arctic Spill Occurrence - Sale 2 - Wells - Summary

Year	Production [MMbbl]	Small and Medium Spills 50-999 bbl			Large Spills 1000-9999 bbl			Huge Spills =>10000 bbl			Significant Spills =>1000 bbl			All Spills		
		Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 103years	Frequency Spills per 109 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]
2004																
2005																
2006																
2007		0.158		0.082	0.476		5.862	0.751		87.639	1.227		93.501	1.386		93.583
2008		0.158		0.082	0.476		5.862	0.751		87.639	1.227		93.501	1.386		93.583
2009		0.097		0.050	0.291		3.581	0.581		77.994	0.872		81.575	0.969		81.626
2010		0.181		0.094	0.544		6.699	0.859		100.159	1.403		106.858	1.584		106.952
2011																
2012		0.415		0.216	1.248		15.377	1.979		231.464	3.227		246.840	3.642		247.056
2013	**7.9**	0.448	0.057	0.233	1.344	0.170	16.571	2.298	0.291	282.527	3.642	0.461	299.098	4.089	0.518	299.331
2014	**15.7**	0.347	0.022	0.180	1.040	0.066	12.836	1.844	0.117	231.934	2.885	0.184	244.770	3.231	0.206	244.950
2015	**15.7**	0.236	0.015	0.123	0.708	0.045	8.743	1.180	0.075	142.797	1.888	0.120	151.540	2.124	0.135	151.663
2016	**15.7**	0.267	0.017	0.139	0.800	0.051	9.883	1.334	0.085	161.423	2.134	0.136	171.307	2.401	0.153	171.445
2017	**34.5**	0.400	0.012	0.208	1.201	0.035	14.825	2.001	0.058	242.135	3.202	0.093	256.960	3.602	0.104	257.168
2018	**39.3**	0.605	0.015	0.314	1.816	0.046	22.428	3.027	0.077	366.307	4.843	0.123	388.734	5.449	0.139	389.049
2019	**37.4**	0.708	0.019	0.368	2.124	0.057	26.229	3.540	0.095	428.392	5.664	0.151	454.621	6.372	0.170	454.989
2020	**35.9**	0.708	0.020	0.368	2.124	0.059	26.229	3.540	0.099	428.392	5.664	0.158	454.621	6.372	0.178	454.989
2021	**34.6**	0.708	0.020	0.368	2.124	0.061	26.229	3.540	0.102	428.392	5.664	0.164	454.621	6.372	0.184	454.989
2022	**33.6**	0.708	0.021	0.368	2.124	0.063	26.229	3.540	0.105	428.392	5.664	0.169	454.621	6.372	0.190	454.989
2023	**29.3**	0.708	0.024	0.368	2.124	0.072	26.229	3.540	0.121	428.392	5.664	0.193	454.621	6.372	0.217	454.989
2024	**25.6**	0.708	0.028	0.368	2.124	0.083	26.229	3.540	0.138	428.392	5.664	0.221	454.621	6.372	0.249	454.989
2025	**22.3**	0.708	0.032	0.368	2.124	0.095	26.229	3.540	0.159	428.392	5.664	0.254	454.621	6.372	0.286	454.989
2026	**19.5**	0.708	0.036	0.368	2.124	0.109	26.229	3.540	0.182	428.392	5.664	0.290	454.621	6.372	0.327	454.989
2027	**17.0**	0.708	0.042	0.368	2.124	0.125	26.229	3.540	0.208	428.392	5.664	0.333	454.621	6.372	0.375	454.989
2028	**13.3**	0.472	0.035	0.245	1.416	0.106	17.486	2.360	0.177	285.595	3.776	0.284	303.081	4.248	0.319	303.326
2029	**11.7**	0.472	0.040	0.245	1.416	0.121	17.486	2.360	0.202	285.595	3.776	0.323	303.081	4.248	0.363	303.326
2030	**10.3**	0.472	0.046	0.245	1.416	0.137	17.486	2.360	0.229	285.595	3.776	0.367	303.081	4.248	0.412	303.326
2031	**9.1**	0.472	0.052	0.245	1.416	0.156	17.486	2.360	0.259	285.595	3.776	0.415	303.081	4.248	0.467	303.326
2032	**8.0**	0.472	0.059	0.245	1.416	0.177	17.486	2.360	0.295	285.595	3.776	0.472	303.081	4.248	0.531	303.326
2033	**7.0**	0.472	0.067	0.245	1.416	0.202	17.486	2.360	0.337	285.595	3.776	0.539	303.081	4.248	0.607	303.326
2034	**6.2**	0.472	0.076	0.245	1.416	0.228	17.486	2.360	0.381	285.595	3.78	0.61	303.08	4.248	0.685	303.326
2035	**5.4**	0.472	0.087	0.245	1.416	0.262	17.486	2.360	0.437	285.595	3.78	0.70	303.08	4.248	0.787	303.326
2036																
2037																
2038																
Total LOF	**455.0**	**13.461**		**7**	**40.390**		**499**	**67.348**		**8152**	**107.738**		**8651**	**121.199**		**8658**
Average LOF		**0.421**	**0.030**	**0**	**1.262**	**0.089**	**16**	**2.105**	**0.148**	**255**	**3.367**	**0.237**	**270**	**3.787**	**0.266**	**271**

Table 4.2.12
Arctic Spill Occurrence - Sale 2 - Summary

Year	Facility	Production [MMbbl]	Small and Medium Spills 50-999 bbl			Large Spills 1000-9999 bbl			Huge Spills =>10000 bbl			All Spills		
			Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]
2004	Pipeline													
	Platforms													
	Production Wells													
	Exploration Wells													
	Development Wells													
	Total													
2005	Pipeline													
	Platforms													
	Production Wells													
	Exploration Wells													
	Development Wells													
	Total													
2006	Pipeline													
	Platforms													
	Production Wells													
	Exploration Wells													
	Development Wells													
	Total													
2007	Pipeline													
	Platforms													
	Production Wells													
	Exploration Wells		0.158		0.082	0.476		5.862	0.751		87.639	1.386		93.583
	Development Wells													
	Total		0.158		0.082	0.476		5.862	0.751		87.639	1.386		93.583
2008	Pipeline													
	Platforms													
	Production Wells													
	Exploration Wells		0.158		0.082	0.476		5.862	0.751		87.639	1.386		93.583
	Development Wells													
	Total		0.158		0.082	0.476		5.862	0.751		87.639	1.386		93.583
2009	Pipeline													
	Platforms													
	Production Wells													
	Exploration Wells													
	Development Wells		0.097		0.050	0.291		3.581	0.581		77.994	0.969		81.626
	Total		0.097		0.050	0.291		3.581	0.581		77.994	0.969		81.626
2010	Pipeline													
	Platforms													
	Production Wells													
	Exploration Wells		0.181		0.094	0.544		6.699	0.859		100.159	1.584		106.952
	Development Wells													
	Total		0.181		0.094	0.544		6.699	0.859		100.159	1.584		106.952
2011	Pipeline													
	Platforms													
	Production Wells													
	Exploration Wells													
	Development Wells													
	Total													
2012	Pipeline													
	Platforms		0.486		0.220	0.041		0.232	0.041		0.232	0.568		0.683
	Production Wells		0.031		0.016	0.092		1.140	0.154		18.626	0.277		19.782
	Exploration Wells		0.384		0.200	1.156		14.236	1.825		212.838	3.365		227.274
	Development Wells													
	Total		0.901		0.435	1.289		15.608	2.020		231.695	4.210		247.739
2013	Pipeline		1.367	0.173	0.525	1.105	0.140	5.721	0.354	0.045	5.504	2.826	0.358	11.751
	Platforms		2.105	0.266	0.951	0.178	0.023	1.004	0.178	0.023	1.004	2.461	0.312	2.959
	Production Wells	7.9	0.133	0.017	0.069	0.400	0.051	4.942	0.667	0.084	80.712	1.201	0.152	85.723
	Exploration Wells		0.204	0.026	0.106	0.612	0.077	7.537	0.966	0.122	112.679	1.782	0.226	120.321
	Development Wells		0.111	0.014	0.058	0.332	0.042	4.093	0.664	0.084	89.136	1.107	0.140	93.287
	Total		3.919	0.496	1.709	2.628	0.333	23.297	2.830	0.358	289.035	9.377	1.187	314.040
2014	Pipeline		1.367	0.087	0.525	1.105	0.070	5.721	0.354	0.023	5.504	2.826	0.180	11.751
	Platforms		3.724	0.237	1.683	0.315	0.020	1.776	0.315	0.020	1.776	4.355	0.277	5.235
	Production Wells	15.7	0.236	0.015	0.123	0.708	0.045	8.743	1.180	0.075	142.797	2.124	0.135	151.663
	Exploration Wells													
	Development Wells		0.111	0.007	0.058	0.332	0.021	4.093	0.664	0.042	89.136	1.107	0.071	93.287
	Total		5.437	0.346	2.388	2.461	0.157	20.333	2.514	0.160	239.215	10.412	0.663	261.936
2015	Pipeline		1.367	0.087	0.525	1.105	0.070	5.721	0.354	0.023	5.504	2.826	0.180	11.751
	Platforms		3.724	0.237	1.683	0.315	0.020	1.776	0.315	0.020	1.776	4.355	0.277	5.235
	Production Wells	15.7	0.236	0.015	0.123	0.708	0.045	8.743	1.180	0.075	142.797	2.124	0.135	151.663
	Exploration Wells													
	Development Wells													
	Total		5.327	0.339	2.330	2.129	0.136	16.241	1.849	0.118	150.078	9.305	0.593	168.649
2016	Pipeline		1.367	0.087	0.525	1.105	0.070	5.721	0.354	0.023	5.504	2.826	0.180	11.751
	Platforms		4.235	0.270	1.914	0.359	0.023	2.020	0.359	0.023	2.020	4.952	0.315	5.954
	Production Wells	15.7	0.267	0.017	0.139	0.800	0.051	9.883	1.334	0.085	161.423	2.401	0.153	171.445
	Exploration Wells													
	Development Wells													
	Total		5.869	0.374	2.577	2.265	0.144	17.625	2.047	0.130	168.947	10.180	0.648	189.149
2017	Pipeline		5.521	0.160	2.083	4.096	0.119	21.233	1.295	0.038	20.088	10.912	0.316	43.404
	Platforms		6.450	0.187	2.915	0.546	0.016	3.075	0.546	0.016	3.075	7.542	0.219	9.065
	Production Wells	34.5	0.400	0.012	0.208	1.201	0.035	14.825	2.001	0.058	242.135	3.602	0.104	257.168
	Exploration Wells													
	Development Wells													
	Total		12.371	0.359	5.205	5.843	0.169	39.133	3.842	0.111	265.298	22.056	0.639	309.637
2018	Pipeline		5.521	0.140	2.083	4.096	0.104	21.233	1.295	0.033	20.088	10.912	0.278	43.404
	Platforms		9.857	0.251	4.455	0.834	0.021	4.699	0.834	0.021	4.699	11.526	0.293	13.852
	Production Wells	39.3	0.605	0.015	0.314	1.816	0.046	22.428	3.027	0.077	366.307	5.449	0.139	389.049
	Exploration Wells													
	Development Wells													
	Total		15.983	0.407	6.852	6.747	0.172	48.359	5.157	0.131	391.094	27.887	0.710	446.305
2019	Pipeline		5.521	0.148	2.083	4.096	0.110	21.233	1.295	0.035	20.088	10.912	0.292	43.404
	Platforms		11.561	0.309	5.225	0.979	0.026	5.511	0.979	0.026	5.511	13.518	0.361	16.246
	Production Wells	37.4	0.708	0.019	0.368	2.124	0.057	26.229	3.540	0.095	428.392	6.372	0.170	454.989
	Exploration Wells													
	Development Wells													
	Total		17.790	0.476	7.675	7.199	0.192	52.972	5.814	0.155	453.991	30.803	0.824	514.639
2020	Pipeline		5.521	0.154	2.083	4.096	0.114	21.233	1.295	0.036	20.088	10.912	0.304	43.404
	Platforms		11.561	0.322	5.225	0.979	0.027	5.511	0.979	0.027	5.511	13.518	0.377	16.246
	Production Wells	35.9	0.708	0.020	0.368	2.124	0.059	26.229	3.540	0.099	428.392	6.372	0.178	454.989
	Exploration Wells													
	Development Wells													
	Total		17.790	0.496	7.675	7.199	0.201	52.972	5.814	0.162	453.991	30.803	0.858	514.639

Table 4.2.12
Arctic Spill Occurrence - Sale 2 - Summary

Year	Facility	Production [MMbbl]	Small and Medium Spills 50-999 bbl			Large Spills 1000-9999 bbl			Huge Spills =>10000 bbl			All Spills		
			Frequency Spills per 10^3 years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3 years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3 years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3 years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]
2021	Pipeline	34.6	5.521	0.160	2.083	4.096	0.118	21.233	1.295	0.037	20.088	10.912	0.315	43.404
	Platforms		11.561	0.334	5.225	0.979	0.028	5.511	0.979	0.028	5.511	13.518	0.391	16.246
	Production Wells		0.708	0.020	0.368	2.124	0.061	26.229	3.540	0.102	428.392	6.372	0.184	454.989
	Exploration Wells													
	Development Wells													
	Total		17.790	0.514	7.675	7.199	0.208	52.972	5.814	0.168	453.991	30.803	0.890	514.639
2022	Pipeline	33.6	5.521	0.164	2.083	4.096	0.122	21.233	1.295	0.039	20.088	10.912	0.325	43.404
	Platforms		11.561	0.344	5.225	0.979	0.029	5.511	0.979	0.029	5.511	13.518	0.402	16.246
	Production Wells		0.708	0.021	0.368	2.124	0.063	26.229	3.540	0.105	428.392	6.372	0.190	454.989
	Exploration Wells													
	Development Wells													
	Total		17.790	0.529	7.675	7.199	0.214	52.972	5.814	0.173	453.991	30.803	0.917	514.639
2023	Pipeline	29.3	5.521	0.188	2.083	4.096	0.140	21.233	1.295	0.044	20.088	10.912	0.372	43.404
	Platforms		11.561	0.395	5.225	0.979	0.033	5.511	0.979	0.033	5.511	13.518	0.461	16.246
	Production Wells		0.708	0.024	0.368	2.124	0.072	26.229	3.540	0.121	428.392	6.372	0.217	454.989
	Exploration Wells													
	Development Wells													
	Total		17.790	0.607	7.675	7.199	0.246	52.972	5.814	0.198	453.991	30.803	1.051	514.639
2024	Pipeline	25.6	5.521	0.216	2.083	4.096	0.160	21.233	1.295	0.051	20.088	10.912	0.426	43.404
	Platforms		11.561	0.452	5.225	0.979	0.038	5.511	0.979	0.038	5.511	13.518	0.528	16.246
	Production Wells		0.708	0.028	0.368	2.124	0.083	26.229	3.540	0.138	428.392	6.372	0.249	454.989
	Exploration Wells													
	Development Wells													
	Total		17.790	0.695	7.675	7.199	0.281	52.972	5.814	0.227	453.991	30.803	1.203	514.639
2025	Pipeline	22.3	5.521	0.248	2.083	4.096	0.184	21.233	1.295	0.058	20.088	10.912	0.489	43.404
	Platforms		11.561	0.518	5.225	0.979	0.044	5.511	0.979	0.044	5.511	13.518	0.606	16.246
	Production Wells		0.708	0.032	0.368	2.124	0.095	26.229	3.540	0.159	428.392	6.372	0.286	454.989
	Exploration Wells													
	Development Wells													
	Total		17.790	0.798	7.675	7.199	0.323	52.972	5.814	0.261	453.991	30.803	1.381	514.639
2026	Pipeline	19.5	5.521	0.283	2.083	4.096	0.210	21.233	1.295	0.066	20.088	10.912	0.560	43.404
	Platforms		11.561	0.593	5.225	0.979	0.050	5.511	0.979	0.050	5.511	13.518	0.693	16.246
	Production Wells		0.708	0.036	0.368	2.124	0.109	26.229	3.540	0.182	428.392	6.372	0.327	454.989
	Exploration Wells													
	Development Wells													
	Total		17.790	0.912	7.675	7.199	0.369	52.972	5.814	0.298	453.991	30.803	1.580	514.639
2027	Pipeline	17.0	5.521	0.325	2.083	4.096	0.241	21.233	1.295	0.076	20.088	10.912	0.642	43.404
	Platforms		11.561	0.680	5.225	0.979	0.058	5.511	0.979	0.058	5.511	13.518	0.795	16.246
	Production Wells		0.708	0.042	0.368	2.124	0.125	26.229	3.540	0.208	428.392	6.372	0.375	454.989
	Exploration Wells													
	Development Wells													
	Total		17.790	1.046	7.675	7.199	0.423	52.972	5.814	0.342	453.991	30.803	1.812	514.639
2028	Pipeline	13.3	3.471	0.261	1.295	2.438	0.183	12.651	0.764	0.057	11.832	6.673	0.502	25.778
	Platforms		7.837	0.589	3.542	0.663	0.050	3.734	0.663	0.050	3.734	9.163	0.689	11.010
	Production Wells		0.472	0.035	0.245	1.416	0.106	17.486	2.360	0.177	285.595	4.248	0.319	303.326
	Exploration Wells													
	Development Wells													
	Total		11.780	0.886	5.082	4.517	0.340	33.871	3.788	0.285	301.161	20.084	1.510	340.114
2029	Pipeline	11.7	3.471	0.297	1.295	2.438	0.208	12.651	0.764	0.065	11.832	6.673	0.570	25.778
	Platforms		7.837	0.670	3.542	0.663	0.057	3.734	0.663	0.057	3.734	9.163	0.783	11.010
	Production Wells		0.472	0.040	0.245	1.416	0.121	17.486	2.360	0.202	285.595	4.248	0.363	303.326
	Exploration Wells													
	Development Wells													
	Total		11.780	1.007	5.082	4.517	0.386	33.871	3.788	0.324	301.161	20.084	1.717	340.114
2030	Pipeline	10.3	3.471	0.337	1.295	2.438	0.237	12.651	0.764	0.074	11.832	6.673	0.648	25.778
	Platforms		7.837	0.761	3.542	0.663	0.064	3.734	0.663	0.064	3.734	9.163	0.890	11.010
	Production Wells		0.472	0.046	0.245	1.416	0.137	17.486	2.360	0.229	285.595	4.248	0.412	303.326
	Exploration Wells													
	Development Wells													
	Total		11.780	1.144	5.082	4.517	0.439	33.871	3.788	0.368	301.161	20.084	1.950	340.114
2031	Pipeline	8.0	3.471	0.381	1.030	2.438	0.268	10.951	0.764	0.084	10.585	6.673	0.733	22.565
	Platforms		7.837	0.861	3.542	0.663	0.073	3.734	0.663	0.073	3.734	9.163	1.007	11.010
	Production Wells		0.472	0.052	0.245	1.416	0.156	17.486	2.360	0.259	285.595	4.248	0.467	303.326
	Exploration Wells													
	Development Wells													
	Total		11.780	1.294	4.817	4.517	0.496	32.171	3.788	0.416	299.915	20.084	2.207	336.902
2032	Pipeline	7.0	3.471	0.434	1.295	2.438	0.305	12.651	0.764	0.096	11.832	6.673	0.834	25.778
	Platforms		7.837	0.980	3.542	0.663	0.083	3.734	0.663	0.083	3.734	9.163	1.145	11.010
	Production Wells		0.472	0.059	0.245	1.416	0.177	17.486	2.360	0.295	285.595	4.248	0.531	303.326
	Exploration Wells													
	Development Wells													
	Total		11.780	1.472	5.082	4.517	0.565	33.871	3.788	0.473	301.161	20.084	2.511	340.114
2033	Pipeline	5.4	3.471	0.496	1.295	2.438	0.348	12.651	0.764	0.109	11.832	6.673	0.953	25.778
	Platforms		7.837	1.120	3.542	0.663	0.095	3.734	0.663	0.095	3.734	9.163	1.309	11.010
	Production Wells		0.472	0.067	0.245	1.416	0.202	17.486	2.360	0.337	285.595	4.248	0.607	303.326
	Exploration Wells													
	Development Wells													
	Total		11.780	1.683	5.082	4.517	0.645	33.871	3.788	0.541	301.161	20.084	2.869	340.114
2034	Pipeline		3.471	0.560	1.295	2.438	0.393	12.651	0.764	0.123	11.832	6.673	1.076	25.778
	Platforms		7.837	1.264	3.542	0.663	0.107	3.734	0.663	0.107	3.734	9.163	1.478	11.010
	Production Wells		0.472	0.076	0.245	1.416	0.228	17.486	2.360	0.381	285.595	4.248	0.685	303.326
	Exploration Wells													
	Development Wells													
	Total		11.780	1.900	5.082	4.517	0.729	33.871	3.788	0.611	301.161	20.084	3.239	340.114
2035	Pipeline		3.471	0.643	1.295	2.438	0.451	12.651	0.764	0.142	11.832	6.673	1.236	25.778
	Platforms		7.837	1.451	3.542	0.663	0.123	3.734	0.663	0.123	3.734	9.163	1.697	11.010
	Production Wells		0.472	0.087	0.245	1.416	0.262	17.486	2.360	0.437	285.595	4.248	0.787	303.326
	Exploration Wells													
	Development Wells													
	Total		11.780	2.181	5.082	4.517	0.837	33.871	3.788	0.701	301.161	20.084	3.719	340.114
2036	Pipeline		0.664		0.256	0.521		2.697	0.168		2.611	1.353		5.563
	Platforms													
	Production Wells													
	Exploration Wells													
	Development Wells													
	Total		0.664		0.256	0.521		2.697	0.168		2.611	1.353		5.563
2037	Pipeline		0.664		0.256	0.521		2.697	0.168		2.611	1.353		5.563
	Platforms													
	Production Wells													
	Exploration Wells													
	Development Wells													
	Total		0.664		0.256	0.521		2.697	0.168		2.611	1.353		5.563
	Pipeline		0.664		0.256	0.521		2.697	0.168		2.611	1.353		5.563
	Platforms													

Table 4.2.12
Arctic Spill Occurrence - Sale 2 - Summary

Year	Facility	Production [MMbbl]	Small and Medium Spills 50-999 bbl			Large Spills 1000-9999 bbl			Huge Spills =>10000 bbl			All Spills		
			Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]
2038	Production Wells													
	Exploration Wells													
	Development Wells													
	Total		0.664		0.256	0.521		2.697	0.168		2.611	1.353		5.563

Table 4.2.13
Arctic Spill Occurrence - Sale 2 - Annual Summary

Year	Production [MMbbl]	Small and Medium Spills 50-999 bbl			Large Spills 1000-9999 bbl			Huge Spills =>10000 bbl			Significant Spills =>1000 bbl			All Spills		
		Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 103years	Frequency Spills per 109 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]
2004																
2005																
2006																
2007		0.158		0.082	0.476		5.862	0.751		87.639	1.227		93.501	1.386		93.583
2008		0.158		0.082	0.476		5.862	0.751		87.639	1.227		93.501	1.386		93.583
2009		0.097		0.050	0.291		3.581	0.581		77.994	0.872		81.575	0.969		81.626
2010		0.181		0.094	0.544		6.699	0.859		100.159	1.403		106.858	1.584		106.952
2011																
2012		0.901		0.435	1.289		15.608	2.020		231.695	3.309		247.304	4.210		247.739
2013	**7.9**	3.919	0.496	1.709	2.628	0.333	23.297	2.830	0.358	289.035	5.458	0.691	312.332	9.377	1.187	314.040
2014	**15.7**	5.437	0.346	2.388	2.461	0.157	20.333	2.514	0.160	239.215	4.975	0.317	259.548	10.412	0.663	261.936
2015	**15.7**	5.327	0.339	2.330	2.129	0.136	16.241	1.849	0.118	150.078	3.978	0.253	166.319	9.305	0.593	168.649
2016	**15.7**	5.869	0.374	2.577	2.265	0.144	17.625	2.047	0.130	168.947	4.311	0.275	186.572	10.180	0.648	189.149
2017	**34.5**	12.371	0.359	5.205	5.843	0.169	39.133	3.842	0.111	265.298	9.685	0.281	304.432	22.056	0.639	309.637
2018	**39.3**	15.983	0.407	6.852	6.747	0.172	48.359	5.157	0.131	391.094	11.904	0.303	439.453	27.887	0.710	446.305
2019	**37.4**	17.790	0.476	7.675	7.199	0.192	52.972	5.814	0.155	453.991	13.013	0.348	506.964	30.803	0.824	514.639
2020	**35.9**	17.790	0.496	7.675	7.199	0.201	52.972	5.814	0.162	453.991	13.013	0.362	506.964	30.803	0.858	514.639
2021	**34.6**	17.790	0.514	7.675	7.199	0.208	52.972	5.814	0.168	453.991	13.013	0.376	506.964	30.803	0.890	514.639
2022	**33.6**	17.790	0.529	7.675	7.199	0.214	52.972	5.814	0.173	453.991	13.013	0.387	506.964	30.803	0.917	514.639
2023	**29.3**	17.790	0.607	7.675	7.199	0.246	52.972	5.814	0.198	453.991	13.013	0.444	506.964	30.803	1.051	514.639
2024	**25.6**	17.790	0.695	7.675	7.199	0.281	52.972	5.814	0.227	453.991	13.013	0.508	506.964	30.803	1.203	514.639
2025	**22.3**	17.790	0.798	7.675	7.199	0.323	52.972	5.814	0.261	453.991	13.013	0.584	506.964	30.803	1.381	514.639
2026	**19.5**	17.790	0.912	7.675	7.199	0.369	52.972	5.814	0.298	453.991	13.013	0.667	506.964	30.803	1.580	514.639
2027	**17.0**	17.790	1.046	7.675	7.199	0.423	52.972	5.814	0.342	453.991	13.013	0.765	506.964	30.803	1.812	514.639
2028	**13.3**	11.780	0.886	5.082	4.517	0.340	33.871	3.788	0.285	301.161	8.305	0.624	335.032	20.084	1.510	340.114
2029	**11.7**	11.780	1.007	5.082	4.517	0.386	33.871	3.788	0.324	301.161	8.305	0.710	335.032	20.084	1.717	340.114
2030	**10.3**	11.780	1.144	5.082	4.517	0.439	33.871	3.788	0.368	301.161	8.305	0.806	335.032	20.084	1.950	340.114
2031	**9.1**	11.780	1.294	4.817	4.517	0.496	32.171	3.788	0.416	299.915	8.305	0.913	332.085	20.084	2.207	336.902
2032	**8.0**	11.780	1.472	5.082	4.517	0.565	33.871	3.788	0.473	301.161	8.305	1.038	335.032	20.084	2.511	340.114
2033	**7.0**	11.780	1.683	5.082	4.517	0.645	33.871	3.788	0.541	301.161	8.305	1.186	335.032	20.084	2.869	340.114
2034	**6.2**	11.780	1.900	5.082	4.517	0.729	33.871	3.788	0.611	301.16	8.30	1.34	335.03	20.084	3.239	340.114
2035	**5.4**	11.780	2.181	5.082	4.517	0.837	33.871	3.788	0.701	301.16	8.30	1.54	335.03	20.084	3.719	340.114
2036		0.664		0.256	0.521		2.697	0.168		2.61	0.69		5.31	1.353		5.563
2037		0.664		0.256	0.521		2.697	0.168		2.61	0.69		5.31	1.353		5.563
2038		0.664		0.256	0.521		2.697	0.168		2.61	0.69		5.31	1.353		5.563
Total LOF	**455.0**	**306.738**		**132**	**127.636**		**957**	**106.334**		**8591**	**233.971**		**9547**	**540.709**		**9679**
Average LOF		**9.586**	**0.674**	**4**	**3.989**	**0.281**	**30**	**3.323**	**0.234**	**268**	**7.312**	**0.514**	**298**	**16.897**	**1.188**	**302**

Table 4.2.14
Sale 2 - Year 2024 - Monte Carlo Results

Sale 2 Year 2024	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills
	Frequency Spills per 10^3years					Frequency Spills per 10^9 bbl Produced					Spill Index [bbl]				
Mean =	17.79	7.20	5.81	13.01	30.80	0.69	0.28	0.23	0.51	1.20	7.67	52.96	453.69	506.66	514.33
Std Deviation =	6.83	2.16	1.31	2.93	7.48	0.27	0.08	0.05	0.11	0.29	5.13	23.80	170.32	172.17	172.29
Variance =	46.600	4.681	1.725	8.582	55.997	0.071	0.007	0.003	0.013	0.085	26.317	566.610	29008.750	29643.960	29682.260
Skewness =	0.58	0.43	0.14	0.21	0.48	0.58	0.43	0.14	0.21	0.48	1.54	0.74	0.51	0.49	0.49
Kurtosis =	2.72	2.86	2.80	2.83	2.89	2.72	2.86	2.80	2.83	2.89	6.04	3.58	3.16	3.15	3.15
Mode =	12.21	9.91	5.47	13.21	26.10	0.48	0.26	0.25	0.52	1.03	5.80	49.30	389.48	402.09	342.82
Minimum =	4.831	2.189	1.874	4.503	12.825	0.189	0.086	0.073	0.176	0.501	0.276	3.751	58.717	88.681	96.534
5% Perc =	8.519	4.000	3.716	8.381	20.028	0.333	0.156	0.145	0.327	0.782	2.066	19.675	202.090	249.695	256.713
10% Perc =	9.679	4.522	4.118	9.211	21.633	0.378	0.177	0.161	0.360	0.845	2.685	24.676	248.325	297.692	306.357
15% Perc =	10.648	4.924	4.424	9.899	22.958	0.416	0.192	0.173	0.387	0.897	3.146	28.855	281.277	330.409	337.847
20% Perc =	11.529	5.296	4.694	10.467	24.142	0.450	0.207	0.183	0.409	0.943	3.588	32.030	309.008	358.422	367.285
25% Perc =	12.406	5.600	4.911	10.966	25.179	0.485	0.219	0.192	0.428	0.984	4.003	35.286	333.537	384.893	392.824
30% Perc =	13.295	5.887	5.094	11.392	26.262	0.519	0.230	0.199	0.445	1.026	4.457	38.471	355.853	407.446	414.633
35% Perc =	14.076	6.168	5.279	11.794	27.181	0.550	0.241	0.206	0.461	1.062	4.896	41.472	376.016	427.396	435.501
40% Perc =	14.831	6.440	5.454	12.168	28.101	0.579	0.252	0.213	0.475	1.098	5.358	44.346	394.972	449.188	456.873
45% Perc =	15.752	6.714	5.607	12.503	29.131	0.615	0.262	0.219	0.488	1.138	5.765	47.116	415.731	469.861	477.466
50% Perc =	16.729	7.021	5.770	12.884	30.007	0.653	0.274	0.225	0.503	1.172	6.246	50.063	434.697	488.852	496.648
55% Perc =	17.711	7.300	5.929	13.250	30.932	0.692	0.285	0.232	0.518	1.208	6.798	52.956	458.128	513.130	522.007
60% Perc =	18.759	7.593	6.099	13.646	31.914	0.733	0.297	0.238	0.533	1.247	7.434	55.855	481.472	533.978	541.292
65% Perc =	19.836	7.896	6.301	14.088	33.058	0.775	0.308	0.246	0.550	1.291	8.064	59.601	503.270	557.875	565.015
70% Perc =	21.007	8.228	6.477	14.516	34.280	0.821	0.321	0.253	0.567	1.339	8.990	63.092	528.557	582.581	590.804
75% Perc =	22.338	8.608	6.670	14.980	35.770	0.873	0.336	0.261	0.585	1.397	10.019	66.681	558.690	612.608	620.465
80% Perc =	23.776	9.001	6.930	15.523	37.270	0.929	0.352	0.271	0.606	1.456	11.185	71.664	591.243	645.516	653.253
85% Perc =	25.573	9.529	7.214	16.116	38.953	0.999	0.372	0.282	0.630	1.522	12.642	76.973	629.346	684.181	693.292
90% Perc =	27.770	10.138	7.561	16.860	41.099	1.085	0.396	0.295	0.659	1.605	14.535	84.787	682.909	737.664	745.581
95% Perc =	30.251	11.133	8.043	18.040	44.111	1.182	0.435	0.314	0.705	1.723	18.094	97.821	764.912	824.193	830.477
Maximum =	41.851	16.064	10.259	24.334	60.734	1.635	0.627	0.401	0.951	2.372	36.237	170.278	1057.850	1138.342	1152.270

Table 4.2.15
Sale 2 LOF Average - Pipeline - Monte Carlo Results

Sale 2 Pipeline	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills
All years Average LOF	**Frequency Spills per 10^3years**					**Frequency Spills per 10^9 bbl Produced**					**Spill Index [bbl]**				
Mean =	3.00	2.21	0.70	2.90	5.90	0.21	0.16	0.05	0.20	0.42	1.11	11.38	10.75	22.13	23.24
Std Deviation =	1.06	1.01	0.33	1.06	1.50	0.07	0.07	0.02	0.07	0.11	0.74	8.05	5.55	9.72	9.75
Variance =	1.117	1.013	0.108	1.116	2.237	0.006	0.005	0.001	0.006	0.011	0.543	64.802	30.858	94.461	95.105
Skewness =	0.46	0.69	0.64	0.61	0.36	0.46	0.69	0.64	0.61	0.36	1.35	1.40	0.89	0.91	0.90
Kurtosis =	2.67	2.92	2.83	2.96	2.93	2.67	2.92	2.83	2.96	2.93	5.12	5.41	3.53	4.07	4.04
Mode =	2.61	1.70	1.07	3.98	7.04	0.28	0.13	0.08	0.18	0.50	0.71	5.56	6.77	14.90	18.91
Minimum =	0.746	0.332	0.080	0.802	2.094	0.052	0.023	0.006	0.056	0.147	0.014	-0.756	1.402	2.681	3.375
5% Perc =	1.472	0.881	0.262	1.431	3.603	0.104	0.062	0.018	0.101	0.253	0.272	2.182	3.654	9.116	10.171
10% Perc =	1.706	1.043	0.313	1.651	4.012	0.120	0.073	0.022	0.116	0.282	0.364	3.282	4.586	10.971	12.042
15% Perc =	1.884	1.187	0.358	1.815	4.314	0.132	0.084	0.025	0.128	0.303	0.443	4.087	5.241	12.598	13.660
20% Perc =	2.032	1.292	0.396	1.967	4.577	0.143	0.091	0.028	0.138	0.322	0.512	4.856	5.900	13.885	14.930
25% Perc =	2.170	1.416	0.435	2.107	4.814	0.153	0.100	0.031	0.148	0.339	0.574	5.617	6.485	14.991	16.098
30% Perc =	2.314	1.527	0.473	2.234	5.018	0.163	0.107	0.033	0.157	0.353	0.638	6.286	7.043	16.097	17.269
35% Perc =	2.461	1.639	0.513	2.359	5.229	0.173	0.115	0.036	0.166	0.368	0.705	7.031	7.690	17.273	18.348
40% Perc =	2.601	1.762	0.555	2.485	5.434	0.183	0.124	0.039	0.175	0.382	0.768	7.751	8.324	18.333	19.445
45% Perc =	2.736	1.895	0.597	2.607	5.627	0.192	0.133	0.042	0.183	0.396	0.860	8.586	8.988	19.401	20.533
50% Perc =	2.888	2.038	0.636	2.737	5.820	0.203	0.143	0.045	0.193	0.409	0.930	9.403	9.631	20.525	21.683
55% Perc =	3.027	2.174	0.687	2.885	6.001	0.213	0.153	0.048	0.203	0.422	1.012	10.373	10.311	21.711	22.882
60% Perc =	3.177	2.304	0.734	3.050	6.189	0.224	0.162	0.052	0.214	0.435	1.104	11.324	11.131	23.083	24.237
65% Perc =	3.339	2.490	0.789	3.198	6.414	0.235	0.175	0.055	0.225	0.451	1.204	12.320	12.089	24.619	25.624
70% Perc =	3.525	2.680	0.852	3.389	6.644	0.248	0.188	0.060	0.238	0.467	1.326	13.490	13.010	25.923	27.155
75% Perc =	3.723	2.846	0.917	3.592	6.882	0.262	0.200	0.065	0.253	0.484	1.463	14.906	13.930	27.679	28.842
80% Perc =	3.946	3.053	0.993	3.796	7.151	0.278	0.215	0.070	0.267	0.503	1.619	16.915	15.207	29.698	30.878
85% Perc =	4.185	3.305	1.074	4.056	7.484	0.294	0.232	0.076	0.285	0.526	1.821	19.318	16.742	31.966	33.084
90% Perc =	4.466	3.679	1.166	4.404	7.899	0.314	0.259	0.082	0.310	0.556	2.132	22.253	18.661	34.835	36.145
95% Perc =	4.910	4.169	1.307	4.909	8.505	0.345	0.293	0.092	0.345	0.598	2.590	27.547	21.461	40.519	41.789
Maximum =	7.102	5.957	1.942	7.077	11.816	0.499	0.419	0.137	0.498	0.831	5.137	53.160	35.558	69.169	70.200

Table 4.2.16
Sale 2 LOF Average - Platforms - Monte Carlo Results

Sale 2 Platforms	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills
All years Average LOF	**Frequency Spills per 10^3years**					**Frequency Spills per 10^9 bbl Produced**					**Spill Index [bbl]**				
Mean =	6.16	0.52	0.52	1.05	7.21	0.43	0.04	0.04	0.07	0.51	2.80	2.93	2.93	5.87	8.66
Std Deviation =	3.49	0.31	0.31	0.61	3.55	0.25	0.02	0.02	0.04	0.25	2.64	2.35	2.35	4.71	5.41
Variance =	12.151	0.093	0.093	0.374	12.574	0.060	0.000	0.000	0.002	0.062	6.970	5.537	5.537	22.147	29.216
Skewness =	0.67	0.64	0.64	0.64	0.64	0.67	0.64	0.64	0.64	0.64	1.69	1.23	1.23	1.23	1.00
Kurtosis =	2.74	2.62	2.62	2.62	2.73	2.74	2.62	2.62	2.62	2.73	6.41	4.46	4.46	4.46	4.01
Mode =	2.51	0.27	0.27	0.53	13.27	0.18	0.02	0.02	0.03	0.27	2.42	1.15	1.15	2.30	3.81
Minimum =	0.545	0.025	0.025	0.051	1.024	0.038	0.002	0.002	0.004	0.072	-0.710	-1.022	-1.022	-2.043	-1.735
5% Perc =	1.691	0.130	0.130	0.260	2.562	0.119	0.009	0.009	0.018	0.180	0.180	0.289	0.289	0.579	1.881
10% Perc =	2.108	0.166	0.166	0.333	3.083	0.148	0.012	0.012	0.023	0.217	0.392	0.536	0.536	1.072	2.748
15% Perc =	2.516	0.199	0.199	0.398	3.502	0.177	0.014	0.014	0.028	0.246	0.565	0.751	0.751	1.503	3.373
20% Perc =	2.894	0.234	0.234	0.469	3.922	0.204	0.016	0.016	0.033	0.276	0.718	0.962	0.962	1.923	4.020
25% Perc =	3.290	0.270	0.270	0.539	4.311	0.231	0.019	0.019	0.038	0.303	0.887	1.166	1.166	2.331	4.577
30% Perc =	3.702	0.308	0.308	0.615	4.769	0.260	0.022	0.022	0.043	0.335	1.077	1.353	1.353	2.706	5.133
35% Perc =	4.095	0.346	0.346	0.693	5.197	0.288	0.024	0.024	0.049	0.365	1.293	1.569	1.569	3.138	5.704
40% Perc =	4.563	0.384	0.384	0.768	5.622	0.321	0.027	0.027	0.054	0.395	1.508	1.813	1.813	3.626	6.296
45% Perc =	5.046	0.423	0.423	0.846	6.089	0.355	0.030	0.030	0.059	0.428	1.732	2.080	2.080	4.160	6.950
50% Perc =	5.483	0.465	0.465	0.930	6.596	0.386	0.033	0.033	0.065	0.464	1.977	2.306	2.306	4.612	7.533
55% Perc =	6.039	0.508	0.508	1.016	7.121	0.425	0.036	0.036	0.071	0.501	2.299	2.598	2.598	5.197	8.262
60% Perc =	6.590	0.557	0.557	1.114	7.679	0.463	0.039	0.039	0.078	0.540	2.590	2.912	2.912	5.824	8.994
65% Perc =	7.197	0.611	0.611	1.222	8.260	0.506	0.043	0.043	0.086	0.581	2.908	3.252	3.252	6.505	9.809
70% Perc =	7.826	0.668	0.668	1.336	8.893	0.550	0.047	0.047	0.094	0.625	3.313	3.682	3.682	7.364	10.754
75% Perc =	8.494	0.733	0.733	1.465	9.543	0.597	0.052	0.052	0.103	0.671	3.825	4.127	4.127	8.253	11.694
80% Perc =	9.297	0.801	0.801	1.602	10.359	0.654	0.056	0.056	0.113	0.729	4.472	4.650	4.650	9.300	12.834
85% Perc =	10.151	0.882	0.882	1.763	11.221	0.714	0.062	0.062	0.124	0.789	5.294	5.382	5.382	10.765	14.241
90% Perc =	11.258	0.972	0.972	1.945	12.384	0.792	0.068	0.068	0.137	0.871	6.433	6.278	6.278	12.556	16.262
95% Perc =	12.766	1.105	1.105	2.209	13.919	0.898	0.078	0.078	0.155	0.979	8.288	7.688	7.688	15.377	19.175
Maximum =	19.045	1.614	1.614	3.227	19.667	1.339	0.113	0.113	0.227	1.383	17.939	14.094	14.094	28.188	36.110

Table 4.2.17
Sale 2 LOF Average - Wells - Monte Carlo Results

Sale 2 Wells	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills
All years Average LOF	**Frequency Spills per 10^3years**					**Frequency Spills per 10^9 bbl Produced**					**Spill Index [bbl]**				
Mean =	0.42	1.26	2.10	3.37	3.79	0.03	0.09	0.15	0.24	0.27	0.22	15.61	254.78	270.39	270.61
Std Deviation =	0.15	0.46	0.56	0.98	0.99	0.01	0.03	0.04	0.07	0.07	0.15	10.30	94.95	95.74	95.74
Variance =	0.024	0.214	0.310	0.954	0.972	0.000	0.001	0.002	0.005	0.005	0.023	105.992	9015.290	9166.066	9165.545
Skewness =	-0.02	-0.01	-0.02	-0.02	-0.02	-0.02	-0.01	-0.02	-0.02	-0.02	0.79	0.85	0.49	0.47	0.47
Kurtosis =	2.42	2.41	2.71	2.54	2.56	2.42	2.41	2.71	2.54	2.56	3.52	3.49	3.18	3.15	3.15
Mode =	0.45	1.63	1.97	4.37	3.69	0.03	0.11	0.14	0.26	0.26	0.12	13.74	217.66	238.58	238.79
Minimum =	0.041	0.066	0.459	0.774	1.088	0.003	0.005	0.032	0.054	0.077	-0.113	-2.826	27.852	38.251	38.540
5% Perc =	0.161	0.486	1.159	1.709	2.117	0.011	0.034	0.082	0.120	0.149	0.016	2.205	111.605	125.381	125.723
10% Perc =	0.213	0.634	1.378	2.050	2.466	0.015	0.045	0.097	0.144	0.173	0.043	3.791	138.762	152.962	152.991
15% Perc =	0.250	0.750	1.520	2.316	2.752	0.018	0.053	0.107	0.163	0.194	0.066	5.367	156.946	173.236	173.498
20% Perc =	0.283	0.847	1.627	2.508	2.927	0.020	0.060	0.114	0.176	0.206	0.086	6.473	172.669	187.722	188.107
25% Perc =	0.311	0.932	1.720	2.683	3.096	0.022	0.066	0.121	0.189	0.218	0.105	7.762	186.048	202.094	202.440
30% Perc =	0.336	1.002	1.810	2.834	3.255	0.024	0.070	0.127	0.199	0.229	0.122	8.922	198.798	213.806	214.044
35% Perc =	0.357	1.075	1.892	2.980	3.398	0.025	0.076	0.133	0.210	0.239	0.141	10.132	210.440	226.241	226.514
40% Perc =	0.381	1.141	1.967	3.130	3.542	0.027	0.080	0.138	0.220	0.249	0.159	11.292	223.464	237.771	237.899
45% Perc =	0.401	1.206	2.033	3.253	3.671	0.028	0.085	0.143	0.229	0.258	0.175	12.531	234.459	249.945	250.215
50% Perc =	0.422	1.268	2.106	3.373	3.791	0.030	0.089	0.148	0.237	0.267	0.195	13.838	245.944	262.192	262.543
55% Perc =	0.442	1.323	2.172	3.498	3.917	0.031	0.093	0.153	0.246	0.275	0.214	15.073	259.654	274.497	274.704
60% Perc =	0.461	1.383	2.254	3.624	4.044	0.032	0.097	0.159	0.255	0.284	0.235	16.576	271.669	286.793	287.114
65% Perc =	0.483	1.448	2.326	3.745	4.163	0.034	0.102	0.164	0.263	0.293	0.260	18.184	285.650	302.511	302.631
70% Perc =	0.506	1.520	2.407	3.895	4.316	0.036	0.107	0.169	0.274	0.304	0.282	19.900	299.046	315.760	316.013
75% Perc =	0.532	1.598	2.487	4.055	4.474	0.037	0.112	0.175	0.285	0.315	0.310	21.639	314.784	331.330	331.740
80% Perc =	0.559	1.678	2.587	4.240	4.674	0.039	0.118	0.182	0.298	0.329	0.343	23.675	332.342	348.434	348.671
85% Perc =	0.591	1.772	2.693	4.436	4.877	0.042	0.125	0.189	0.312	0.343	0.377	26.260	352.619	370.152	370.324
90% Perc =	0.630	1.888	2.832	4.655	5.084	0.044	0.133	0.199	0.327	0.358	0.428	30.099	379.993	397.508	397.889
95% Perc =	0.675	2.027	3.016	4.981	5.406	0.047	0.143	0.212	0.350	0.380	0.503	35.846	422.854	440.269	440.374
Maximum =	0.809	2.463	3.712	6.089	6.691	0.057	0.173	0.261	0.428	0.471	0.888	59.502	637.301	643.065	643.266

Table 4.2.18
Sale 2 LOF Average Platforms + Wells - Monte Carlo Results

Sale 2 Platforms + Wells	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills
All years Average LOF	**Frequency Spills per 10^3years**					**Frequency Spills per 10^9 bbl Produced**					**Spill Index [bbl]**				
Mean =	6.58	1.78	2.63	4.41	10.99	0.46	0.13	0.18	0.31	0.77	3.01	18.55	257.72	276.26	279.28
Std Deviation =	3.49	0.55	0.64	1.15	3.68	0.25	0.04	0.04	0.08	0.26	2.64	10.60	95.02	95.95	96.00
Variance =	12.172	0.305	0.404	1.322	13.524	0.060	0.002	0.002	0.007	0.067	6.996	112.352	9028.712	9205.630	9216.547
Skewness =	0.67	0.14	0.08	0.12	0.57	0.67	0.14	0.08	0.12	0.57	1.68	0.80	0.49	0.47	0.47
Kurtosis =	2.74	2.70	2.84	2.76	2.76	2.74	2.70	2.84	2.76	2.76	6.40	3.43	3.18	3.15	3.15
Mode =	3.34	1.63	2.02	5.04	8.76	0.24	0.11	0.14	0.37	0.80	1.29	12.16	220.67	216.50	241.28
Minimum =	0.969	0.338	0.865	1.369	2.881	0.068	0.024	0.061	0.096	0.203	-0.557	-2.634	28.118	38.783	40.484
5% Perc =	2.120	0.884	1.563	2.539	5.925	0.149	0.062	0.110	0.179	0.417	0.388	4.549	114.253	131.209	133.065
10% Perc =	2.527	1.063	1.809	2.900	6.640	0.178	0.075	0.127	0.204	0.467	0.605	6.350	141.310	158.087	161.235
15% Perc =	2.954	1.188	1.968	3.196	7.146	0.208	0.084	0.138	0.225	0.503	0.774	7.870	159.730	178.126	180.924
20% Perc =	3.314	1.302	2.083	3.432	7.635	0.233	0.092	0.147	0.241	0.537	0.946	9.233	175.484	192.391	195.662
25% Perc =	3.707	1.400	2.197	3.626	8.131	0.261	0.098	0.154	0.255	0.572	1.124	10.498	188.947	208.063	210.791
30% Perc =	4.134	1.476	2.286	3.799	8.549	0.291	0.104	0.161	0.267	0.601	1.299	11.803	201.508	219.832	223.325
35% Perc =	4.509	1.553	2.374	3.943	9.058	0.317	0.109	0.167	0.277	0.637	1.497	12.944	214.466	232.317	235.472
40% Perc =	4.972	1.625	2.465	4.089	9.514	0.350	0.114	0.173	0.288	0.669	1.718	14.179	226.969	243.788	246.472
45% Perc =	5.451	1.692	2.526	4.232	9.969	0.383	0.119	0.178	0.298	0.701	1.963	15.493	237.825	256.505	259.323
50% Perc =	5.921	1.771	2.605	4.365	10.402	0.416	0.125	0.183	0.307	0.732	2.196	16.862	249.231	267.816	271.121
55% Perc =	6.469	1.844	2.690	4.528	10.944	0.455	0.130	0.189	0.318	0.770	2.488	18.215	262.181	280.222	283.082
60% Perc =	7.018	1.917	2.776	4.689	11.516	0.494	0.135	0.195	0.330	0.810	2.821	19.654	275.161	292.562	296.393
65% Perc =	7.597	1.992	2.867	4.850	12.117	0.534	0.140	0.202	0.341	0.852	3.133	21.363	288.555	308.203	311.122
70% Perc =	8.248	2.083	2.965	5.020	12.743	0.580	0.147	0.209	0.353	0.896	3.533	22.867	302.048	322.557	324.996
75% Perc =	8.904	2.164	3.068	5.207	13.440	0.626	0.152	0.216	0.366	0.945	4.044	24.748	318.008	336.495	339.490
80% Perc =	9.705	2.261	3.164	5.407	14.274	0.683	0.159	0.222	0.380	1.004	4.692	26.797	336.256	354.175	357.819
85% Perc =	10.564	2.370	3.300	5.629	15.121	0.743	0.167	0.232	0.396	1.063	5.540	29.535	355.711	375.428	379.295
90% Perc =	11.683	2.516	3.449	5.938	16.227	0.822	0.177	0.243	0.418	1.141	6.684	33.499	383.207	403.147	405.235
95% Perc =	13.207	2.710	3.697	6.333	17.800	0.929	0.191	0.260	0.445	1.252	8.517	39.115	425.621	446.548	448.884
Maximum =	19.838	3.743	4.906	8.649	24.500	1.395	0.263	0.345	0.608	1.723	18.271	63.550	642.802	654.068	659.406

Table 4.2.19
Sale 2 LOF Average - Monte Carlo Results

Sale 2	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills
All years Average LOF	**Frequency Spills per 10^3years**					**Frequency Spills per 10^9 bbl Produced**					**Spill Index [bbl]**				
Mean =	9.58	3.99	3.32	7.31	16.90	0.67	0.28	0.23	0.51	1.19	4.13	29.93	268.47	298.39	302.52
Std Deviation =	3.62	1.16	0.72	1.58	3.94	0.25	0.08	0.05	0.11	0.28	2.74	13.25	95.30	96.53	96.60
Variance =	13.132	1.338	0.522	2.498	15.532	0.065	0.007	0.003	0.012	0.077	7.506	175.543	9082.338	9318.563	9330.815
Skewness =	0.61	0.44	0.15	0.19	0.46	0.61	0.44	0.15	0.19	0.46	1.50	0.68	0.49	0.46	0.46
Kurtosis =	2.83	2.88	2.90	2.88	2.81	2.83	2.88	2.90	2.88	2.81	5.75	3.38	3.20	3.17	3.17
Mode =	7.03	5.62	3.43	6.55	17.79	0.56	0.23	0.24	0.46	1.09	4.03	26.69	204.96	301.48	271.41
Minimum =	2.301	1.024	1.234	2.761	6.898	0.162	0.072	0.087	0.194	0.485	0.070	0.433	38.838	59.656	62.439
5% Perc =	4.646	2.268	2.160	4.789	11.186	0.327	0.160	0.152	0.337	0.787	1.131	11.277	124.220	151.512	154.858
10% Perc =	5.314	2.576	2.385	5.319	12.097	0.374	0.181	0.168	0.374	0.851	1.443	14.267	152.223	179.212	182.568
15% Perc =	5.844	2.816	2.566	5.667	12.813	0.411	0.198	0.180	0.399	0.901	1.675	16.616	169.756	198.747	202.908
20% Perc =	6.307	2.992	2.714	5.946	13.382	0.444	0.210	0.191	0.418	0.941	1.931	18.355	185.677	214.875	218.844
25% Perc =	6.748	3.131	2.824	6.189	13.928	0.475	0.220	0.199	0.435	0.980	2.163	20.124	199.882	229.254	233.321
30% Perc =	7.148	3.289	2.926	6.433	14.443	0.503	0.231	0.206	0.452	1.016	2.408	21.726	212.430	242.979	247.084
35% Perc =	7.596	3.437	3.021	6.657	14.965	0.534	0.242	0.212	0.468	1.052	2.652	23.325	224.550	255.014	259.584
40% Perc =	8.043	3.572	3.119	6.852	15.468	0.566	0.251	0.219	0.482	1.088	2.879	24.979	237.653	266.264	270.592
45% Perc =	8.529	3.718	3.212	7.057	15.948	0.600	0.261	0.226	0.496	1.122	3.140	26.598	248.318	279.166	282.924
50% Perc =	9.044	3.861	3.307	7.255	16.475	0.636	0.272	0.233	0.510	1.159	3.396	28.137	259.294	291.241	295.071
55% Perc =	9.506	4.019	3.405	7.469	17.034	0.669	0.283	0.239	0.525	1.198	3.703	29.925	272.786	302.156	306.937
60% Perc =	10.068	4.182	3.496	7.683	17.544	0.708	0.294	0.246	0.540	1.234	4.010	31.538	285.574	315.274	319.431
65% Perc =	10.631	4.362	3.589	7.909	18.084	0.748	0.307	0.252	0.556	1.272	4.377	33.593	299.513	330.060	334.246
70% Perc =	11.304	4.559	3.695	8.124	18.776	0.795	0.321	0.260	0.571	1.320	4.790	35.494	313.544	344.131	347.941
75% Perc =	11.952	4.756	3.797	8.373	19.501	0.841	0.334	0.267	0.589	1.372	5.291	37.819	328.438	359.068	362.997
80% Perc =	12.775	4.976	3.916	8.661	20.262	0.898	0.350	0.275	0.609	1.425	5.902	40.905	346.838	377.454	381.629
85% Perc =	13.631	5.234	4.077	8.986	21.234	0.959	0.368	0.287	0.632	1.493	6.780	44.041	366.589	398.175	402.421
90% Perc =	14.783	5.564	4.286	9.369	22.371	1.040	0.391	0.301	0.659	1.573	7.938	48.280	394.892	425.704	429.009
95% Perc =	16.309	6.094	4.559	9.971	24.104	1.147	0.429	0.321	0.701	1.695	9.680	54.370	436.412	468.031	472.231
Maximum =	24.401	8.202	6.052	13.006	30.828	1.716	0.577	0.426	0.915	2.168	19.298	88.145	659.449	681.361	687.319

Table 4.2.20
Composition of Spill Indicators - Sale 2 - Year 2024

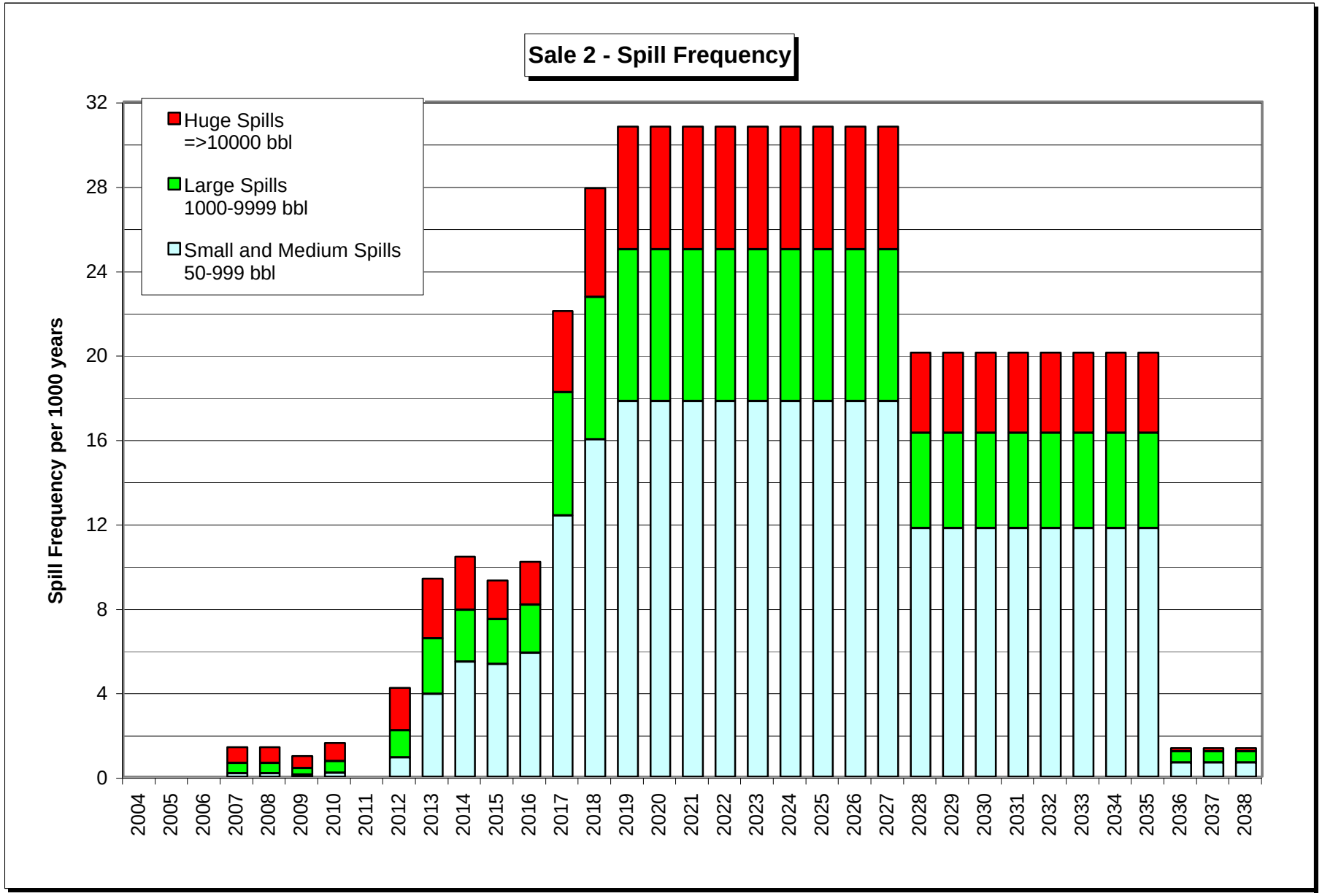
Spill Size	Spill Source									
	P/L		Platforms		Wells		Platforms and Wells		All	
	Sale 2 - Year 2024 Spill Frequency per 10^3 years									
Small and Medium Spills 50-999 bbl	5.521	51%	11.561	86%	0.708	11%	12.269	62%	17.790	58%
Large Spills 1000-9999 bbl	4.096	38%	0.979	7%	2.124	33%	3.103	16%	7.199	23%
Huge Spills =>10000 bbl	1.295	12%	0.979	7%	3.540	56%	4.519	23%	5.814	19%
Significant Spills =>1000 bbl	5.391	49%	1.957	14%	5.664	89%	7.622	38%	13.013	42%
All Spills	**10.912**	**100%**	**13.518**	**100%**	**6.372**	**100%**	**19.890**	**100%**	**30.803**	**100%**
	Sale 2 - LYear 2024 Spill Frequency per 10^9 bbl produced									
Small and Medium Spills 50-999 bbl	0.216	51%	0.452	86%	0.028	11%	0.479	62%	0.695	58%
Large Spills 1000-9999 bbl	0.160	38%	0.038	7%	0.083	33%	0.121	16%	0.281	23%
Huge Spills =>10000 bbl	0.051	12%	0.038	7%	0.138	56%	0.177	23%	0.227	19%
Significant Spills =>1000 bbl	0.211	49%	0.076	14%	0.221	89%	0.298	38%	0.508	42%
All Spills	**0.426**	**100%**	**0.528**	**100%**	**0.249**	**100%**	**0.777**	**100%**	**1.203**	**100%**
	Sale 2 - Year 2024 Spill Index [bbl]									
Small and Medium Spills 50-999 bbl	2	5%	5	32%	0	0%	6	1%	8	1%
Large Spills 1000-9999 bbl	21	49%	6	34%	26	6%	32	7%	53	10%
Huge Spills =>10000 bbl	20	46%	6	34%	428	94%	434	92%	454	88%
Significant Spills =>1000 bbl	41	95%	11	68%	455	100%	466	99%	507	99%
All Spills	**43**	**100%**	**16**	**100%**	**455**	**100%**	**471**	**100%**	**515**	**100%**

Spill Source	Spill Size									
	S+M 50-999 bbl		Large 1000-9999 bbl		Huge =>10000 bbl		Significant =>1000 bbl		All Spills	
	Sale 2 - Year 2024 Spill Frequency per 10^3 years									
P/L	5.521	31%	4.096	57%	1.295	22%	5.391	41%	10.912	35%
Platforms	11.561	65%	0.979	14%	0.979	17%	1.957	15%	13.518	44%
Wells	0.708	4%	2.124	30%	3.540	61%	5.664	44%	6.372	21%
Platforms and Wells	12.269	69%	3.103	43%	4.519	78%	7.622	59%	19.890	65%
All	**17.790**	**100%**	**7.199**	**100%**	**5.814**	**100%**	**13.013**	**100%**	**30.803**	**100%**
	Sale 2 - Year 2024 Spill Frequency per 10^9 bbl produced									
P/L	0.216	31%	0.160	57%	0.051	22%	0.211	41%	0.426	35%
Platforms	0.452	65%	0.038	14%	0.038	17%	0.076	15%	0.528	44%
Wells	0.028	4%	0.083	30%	0.138	61%	0.221	44%	0.249	21%
Platforms and Wells	0.479	69%	0.121	43%	0.177	78%	0.298	59%	0.777	65%
All	**0.695**	**100%**	**0.281**	**100%**	**0.227**	**100%**	**0.508**	**100%**	**1.203**	**100%**
	Sale 2 - Year 2024 Spill Index [bbl]									
P/L	2	27%	21	40%	20	4%	41	8%	43	8%
Platforms	5	68%	6	10%	6	1%	11	2%	16	3%
Wells	0	5%	26	50%	428	94%	455	90%	455	88%
Platforms and Wells	6	73%	32	60%	434	96%	466	92%	471	92%
All	**8**	**100%**	**53**	**100%**	**454**	**100%**	**507**	**100%**	**515**	**100%**

Table 4.2.21
Composition of Spill Indicators - Sale 2 - LOF Average

Spill Size	Spill Source									
	P/L		Platforms		Wells		Platforms and Wells		All	
	Sale 2 - LOF Average Spill Frequency per 10^3 years									
Small and Medium Spills 50-999 bbl	2.999	51%	6.166	86%	0.421	11%	6.587	60%	9.586	57%
Large Spills 1000-9999 bbl	2.204	37%	0.522	7%	1.262	33%	1.784	16%	3.989	24%
Huge Spills =>10000 bbl	0.696	12%	0.522	7%	2.105	56%	2.627	24%	3.323	20%
Significant Spills =>1000 bbl	2.901	49%	1.044	14%	3.367	89%	4.411	40%	7.312	43%
All Spills	**5.899**	**100%**	**7.210**	**100%**	**3.787**	**100%**	**10.998**	**100%**	**16.897**	**100%**
	Sale 2 - LOF Average Spill Frequency per 10^9 bbl produced									
Small and Medium Spills 50-999 bbl	0.211	51%	0.434	86%	0.030	11%	0.463	60%	0.674	57%
Large Spills 1000-9999 bbl	0.155	37%	0.037	7%	0.089	33%	0.125	16%	0.281	24%
Huge Spills =>10000 bbl	0.049	12%	0.037	7%	0.148	56%	0.185	24%	0.234	20%
Significant Spills =>1000 bbl	0.204	49%	0.073	14%	0.237	89%	0.310	40%	0.514	43%
All Spills	**0.415**	**100%**	**0.507**	**100%**	**0.266**	**100%**	**0.773**	**100%**	**1.188**	**100%**
	Sale 2 - LOF Average Spill Index [bbl]									
Small and Medium Spills 50-999 bbl	1	5%	3	32%	0	0%	3	1%	4	1%
Large Spills 1000-9999 bbl	11	49%	3	34%	16	6%	19	7%	30	10%
Huge Spills =>10000 bbl	11	46%	3	34%	255	94%	258	92%	268	89%
Significant Spills =>1000 bbl	22	95%	6	68%	270	100%	276	99%	298	99%
All Spills	**23**	**100%**	**9**	**100%**	**271**	**100%**	**279**	**100%**	**302**	**100%**

Spill Source	Spill Size									
	S+M 50-999 bbl		Large 1000-9999 bbl		Huge =>10000 bbl		Significant =>1000 bbl		All Spills	
	Sale 2 - LOF Average Spill Frequency per 10^3 years									
P/L	2.999	31%	2.204	55%	0.696	21%	2.901	40%	5.899	35%
Platforms	6.166	64%	0.522	13%	0.522	16%	1.044	14%	7.210	43%
Wells	0.421	4%	1.262	32%	2.105	63%	3.367	46%	3.787	22%
Platforms and Wells	6.587	69%	1.784	45%	2.627	79%	4.411	60%	10.998	65%
All	**9.586**	**100%**	**3.989**	**100%**	**3.323**	**100%**	**7.312**	**100%**	**16.897**	**100%**
	Sale 2 - LOF Average Spill Frequency per 10^9 bbl produced									
P/L	0.211	31%	0.155	55%	0.049	21%	0.204	40%	0.415	35%
Platforms	0.434	64%	0.037	13%	0.037	16%	0.073	14%	0.507	43%
Wells	0.030	4%	0.089	32%	0.148	63%	0.237	46%	0.266	22%
Platforms and Wells	0.463	69%	0.125	45%	0.185	79%	0.310	60%	0.773	65%
All	**0.674**	**100%**	**0.281**	**100%**	**0.234**	**100%**	**0.514**	**100%**	**1.188**	**100%**
	Sale 2 - LOF Average Spill Index [bbl]									
P/L	1	27%	11	38%	11	4%	22	7%	23	8%
Platforms	3	68%	3	10%	3	1%	6	2%	9	3%
Wells	0	5%	16	52%	255	95%	270	91%	271	89%
Platforms and Wells	3	73%	19	62%	258	96%	276	93%	279	92%
All	**4**	**100%**	**30**	**100%**	**268**	**100%**	**298**	**100%**	**302**	**100%**


Sale 2 - Spill Frequency
Huge Spills
=>10000 bbl
Large Spills
1000-9999 bbl
Small and Medium Spills
50-999 bbl
Spill Frequency per 1000 years
0
4
8
12
16
20
24
28
32
2004
2005
2006
2007
2008
2009
2010
2011
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2014
2015
2016
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2018
2019
2020
2021
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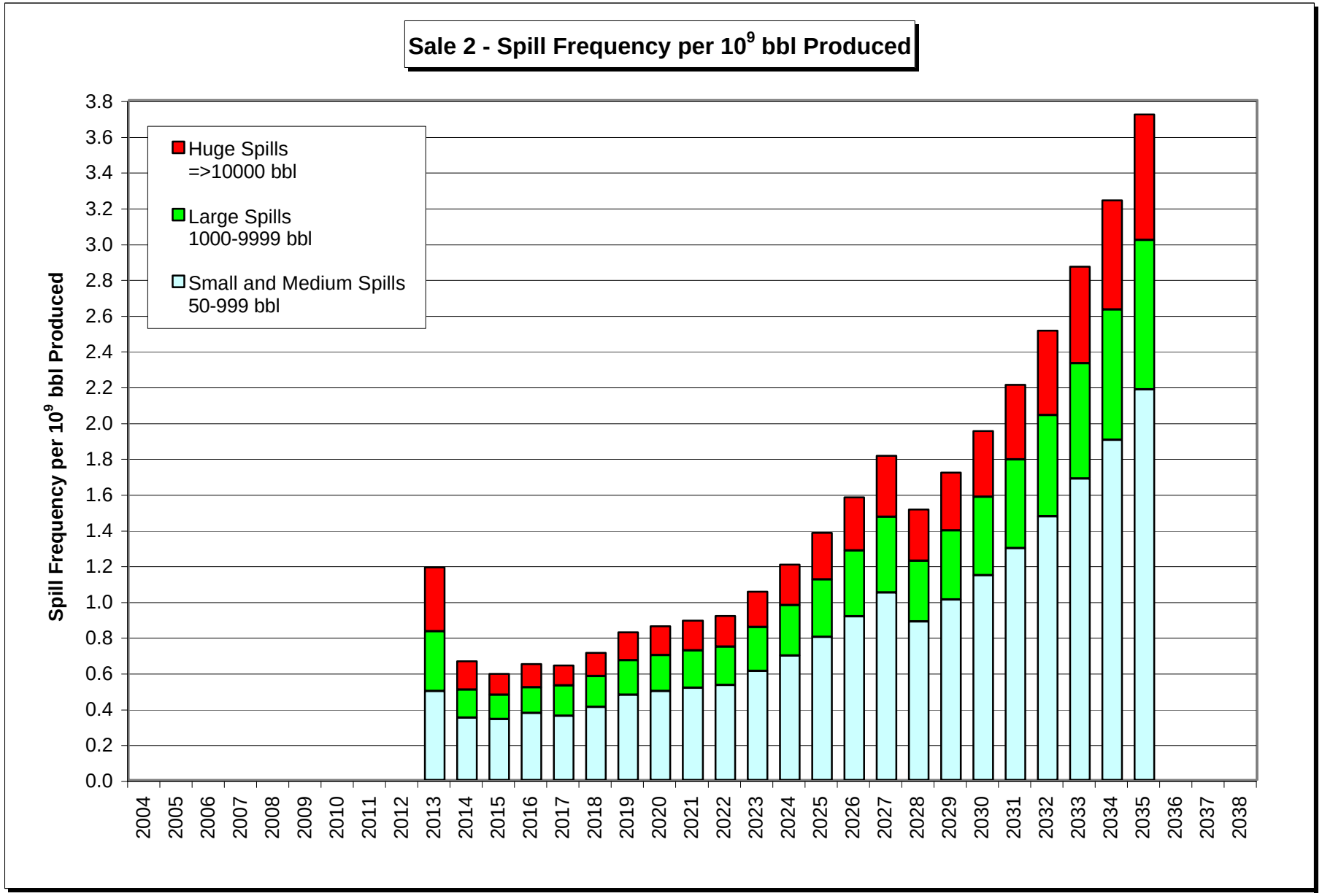
Sale 2 - Spill Frequency per 10^9 bbl Produced
Huge Spills
=>10000 bbl
Large Spills
1000-9999 bbl
Small and Medium Spills
50-999 bbl
Spill Frequency per 10^9 bbl Produced
3.8
3.6
3.4
3.2
3.0
2.8
2.6
2.4
2.2
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
2004
2005
2006
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2008
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2019
2020
2021
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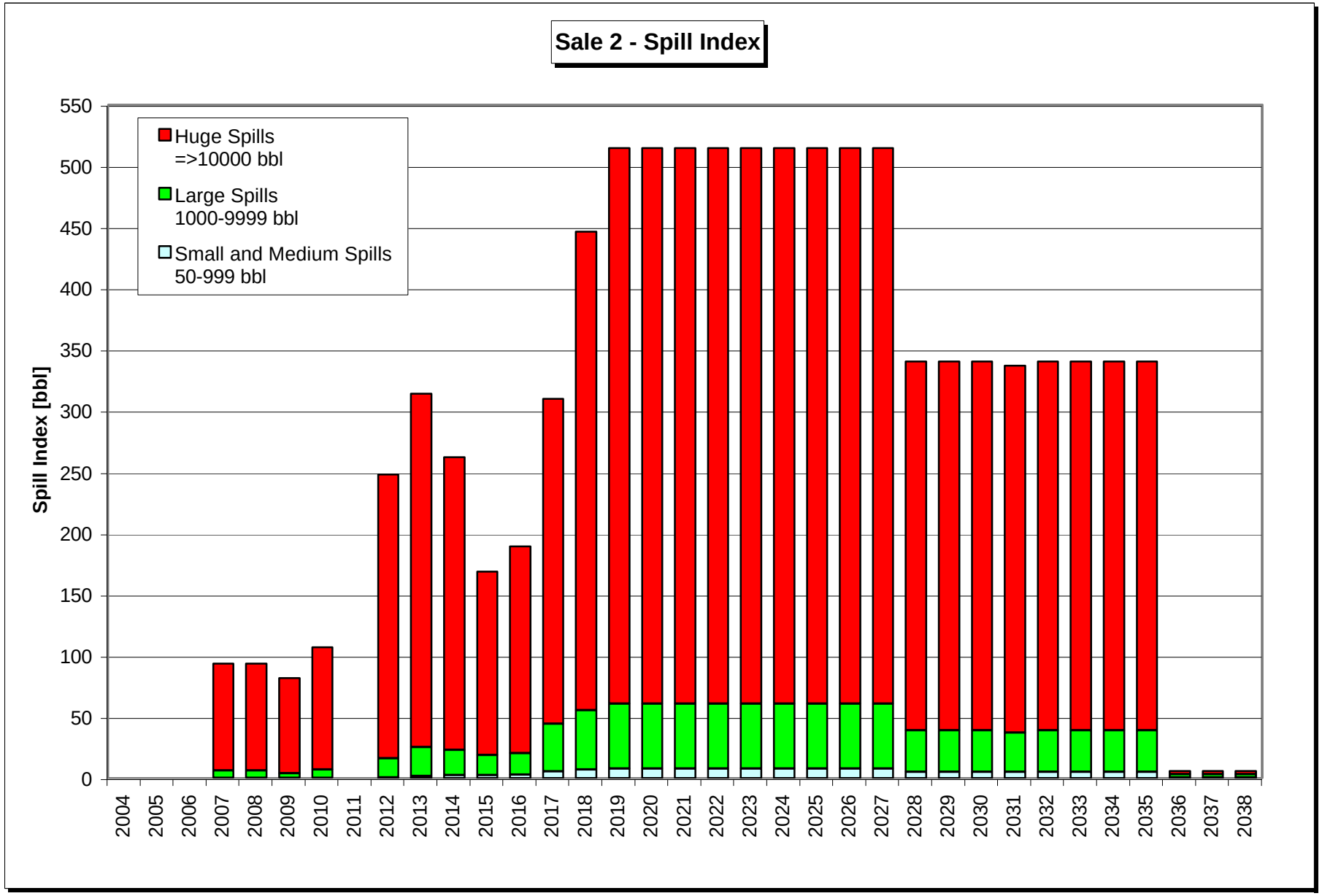
Sale 2 - Spill Index
Huge Spills
=>10000 bbl
Large Spills
1000-9999 bbl
Small and Medium Spills
50-999 bbl
Spill Index [bbl]
550
500
450
400
350
300
250
200
150
100
50
0
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
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2019
2020
2021
2022
2023
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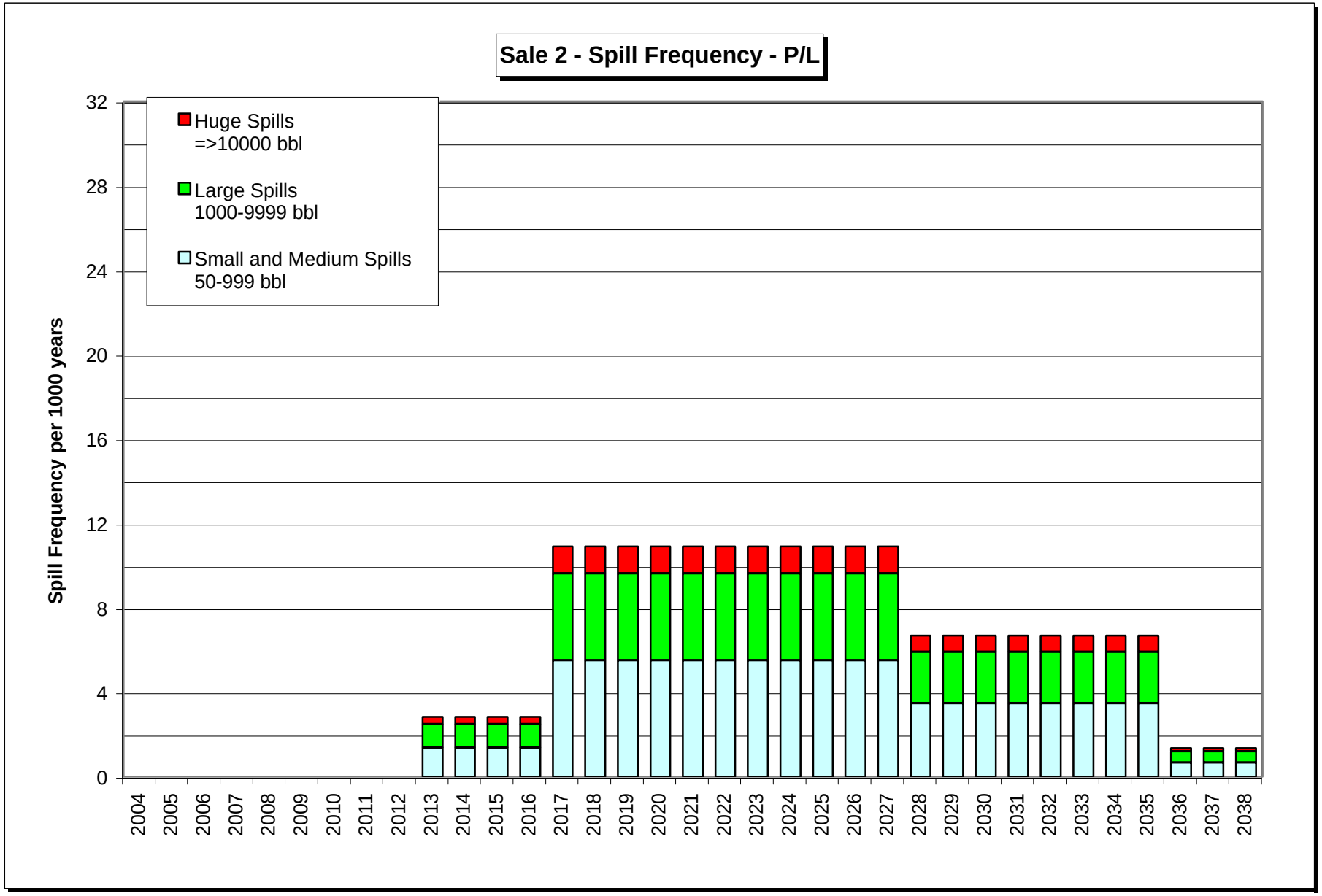
Sale 2 - Spill Frequency - P/L
Huge Spills
=>10000 bbl
Large Spills
1000-9999 bbl
Small and Medium Spills
50-999 bbl
Spill Frequency per 1000 years
0
4
8
12
16
20
24
28
32
2004
2005
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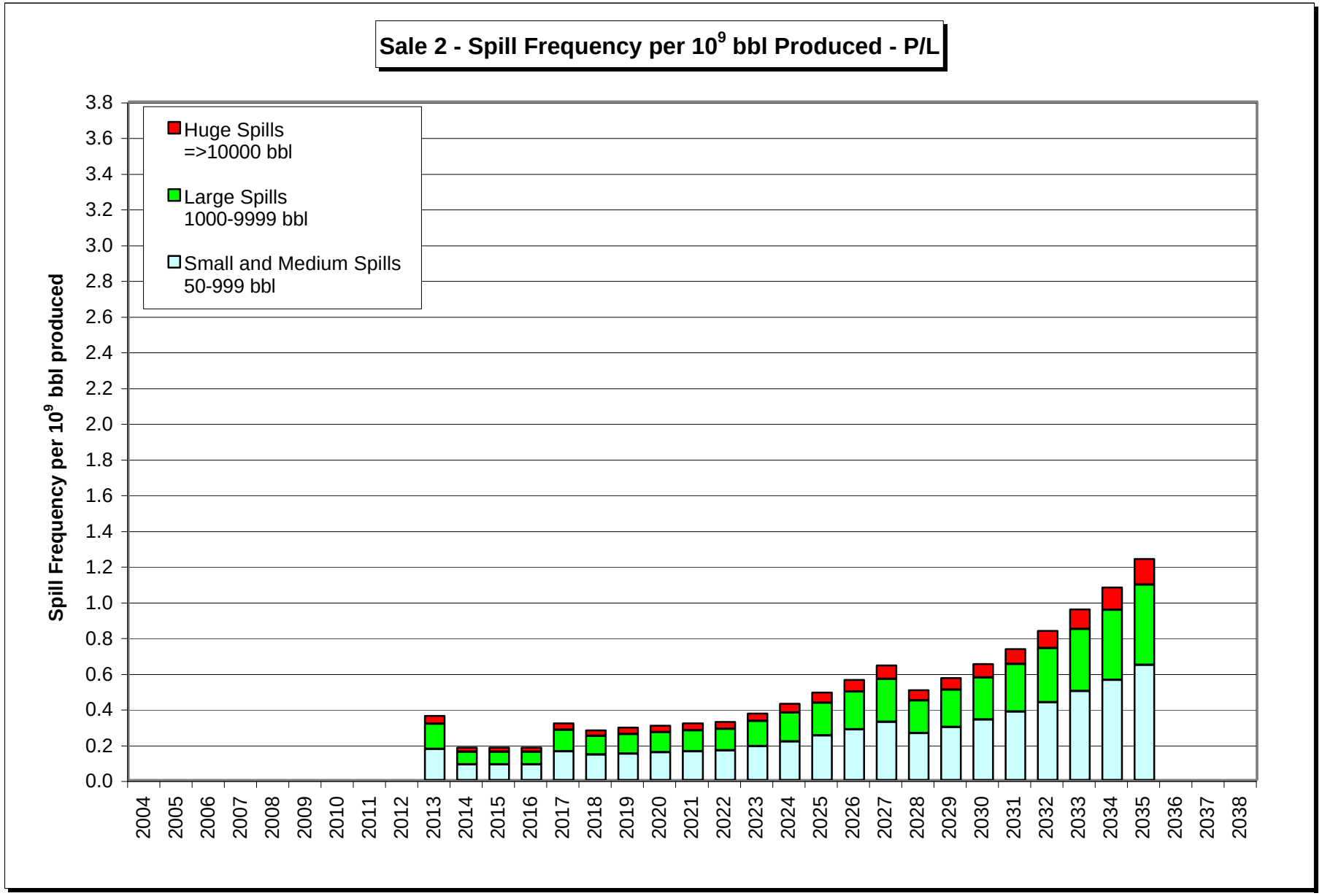
Sale 2 - Spill Frequency per 10^9 bbl Produced - P/L
Huge Spills
=>10000 bbl
Large Spills
1000-9999 bbl
Small and Medium Spills
50-999 bbl
Spill Frequency per 10^9 bbl produced
3.8
3.6
3.4
3.2
3.0
2.8
2.6
2.4
2.2
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
2004
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2020
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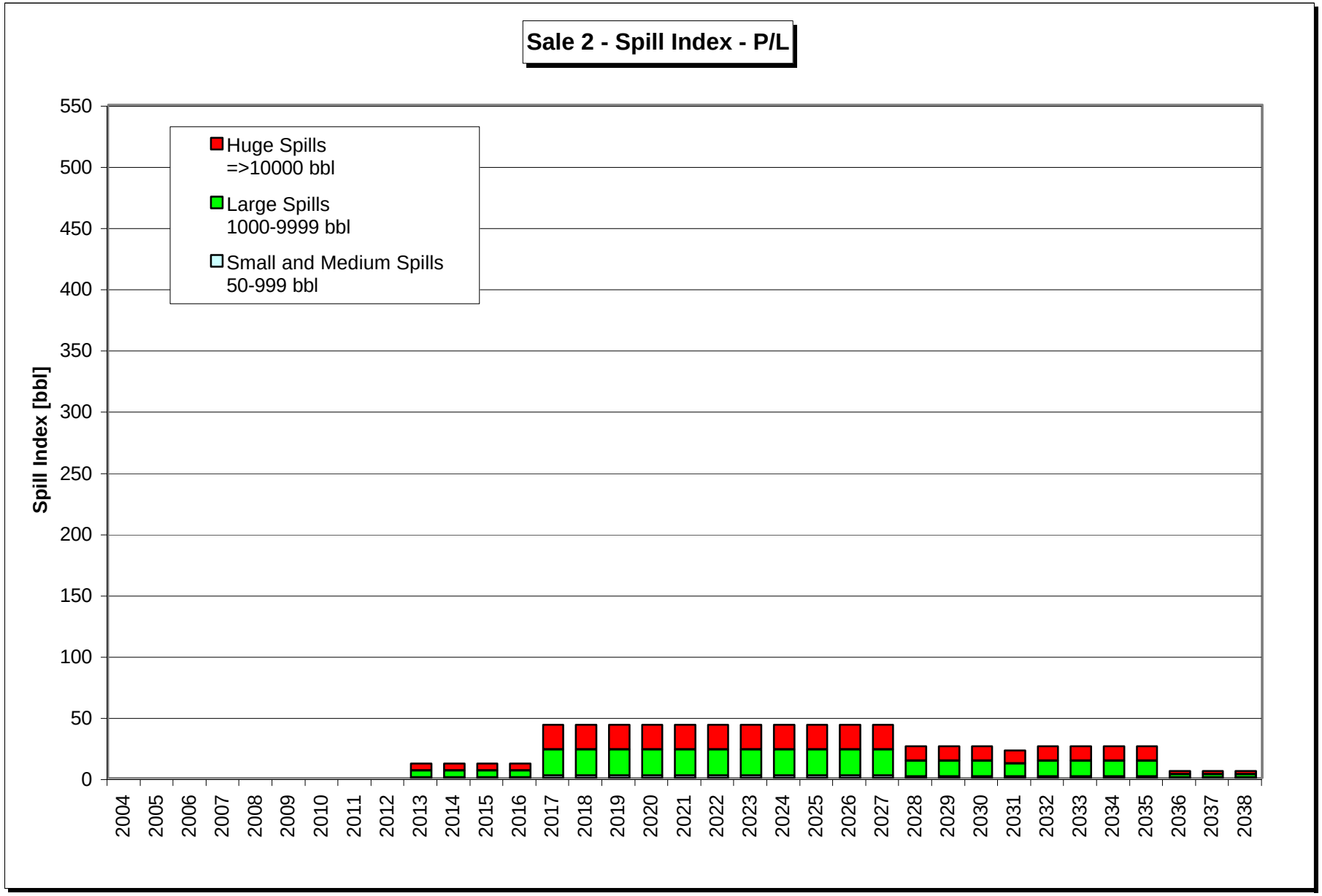
Sale 2 - Spill Index - P/L
Huge Spills
=>10000 bbl
Large Spills
1000-9999 bbl
Small and Medium Spills
50-999 bbl
Spill Index [bbl]
550
500
450
400
350
300
250
200
150
100
50
0
2004
2005
2006
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2008
2009
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2012
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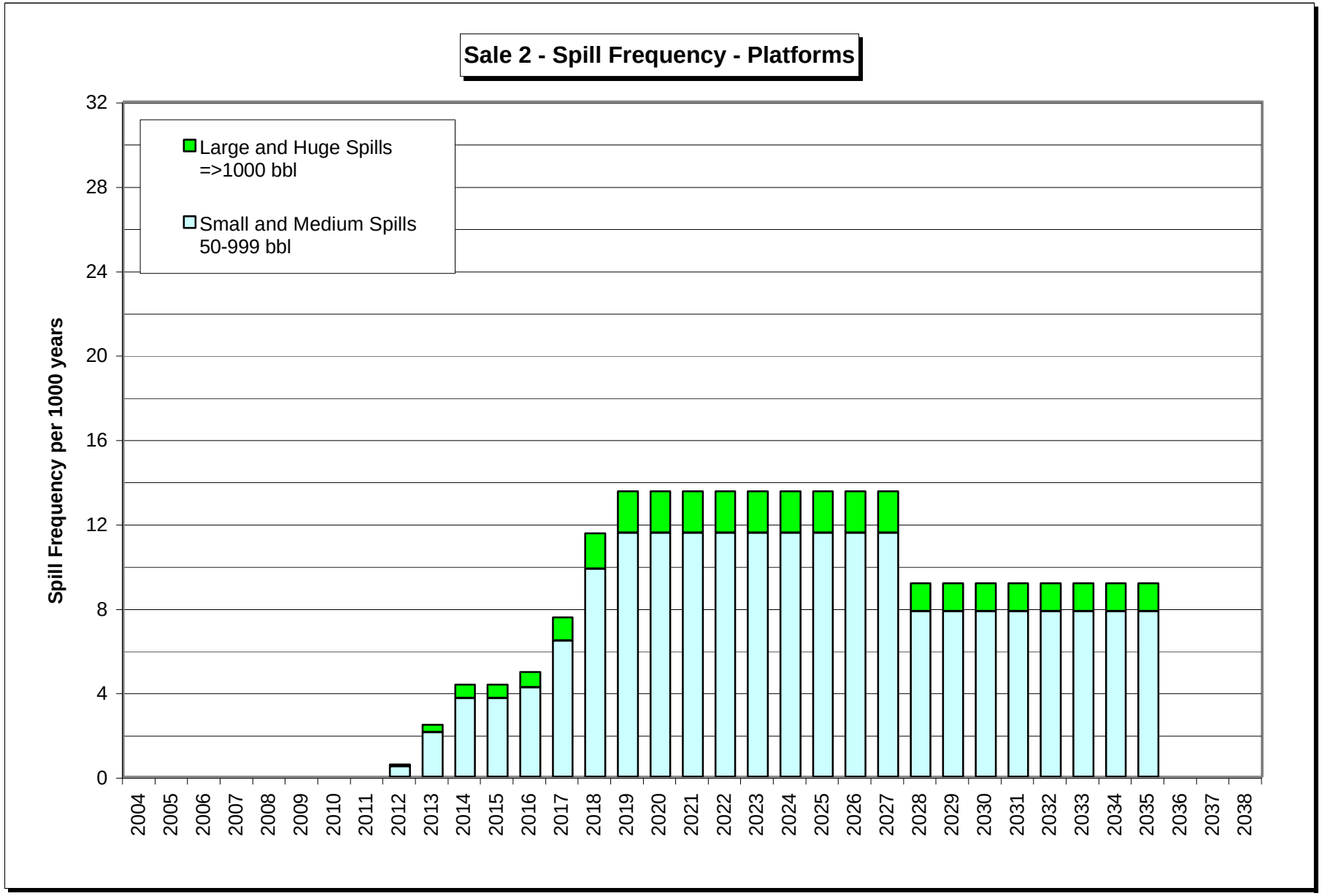
Sale 2 - Spill Frequency - Platforms
Large and Huge Spills =>1000 bbl
Small and Medium Spills 50-999 bbl
Spill Frequency per 1000 years
0
4
8
12
16
20
24
28
32
2004
2005
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2007
2008
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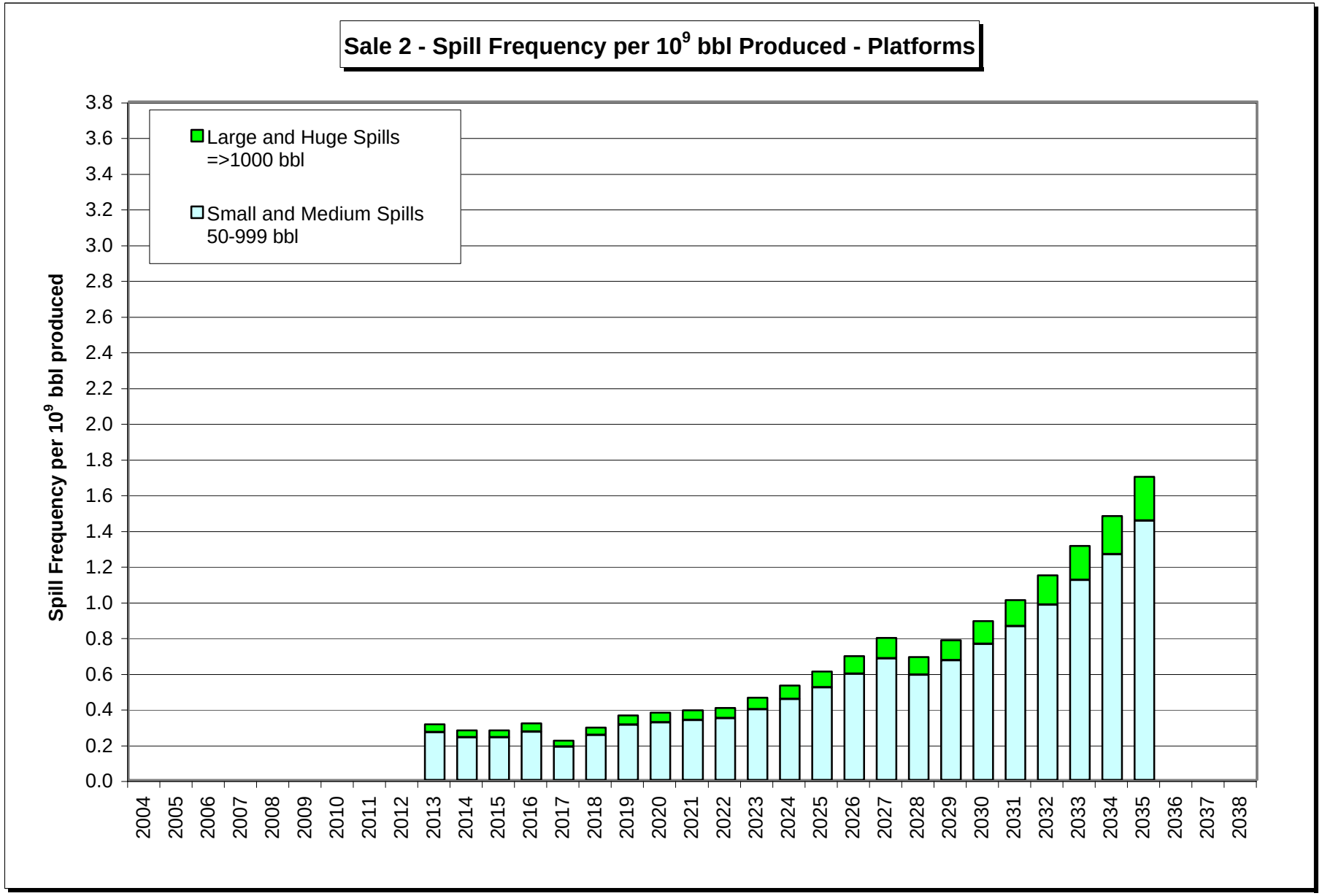
Sale 2 - Spill Frequency per 10^9 bbl Produced - Platforms
Large and Huge Spills =>1000 bbl
Small and Medium Spills 50-999 bbl
Spill Frequency per 10^9 bbl produced
3.8
3.6
3.4
3.2
3.0
2.8
2.6
2.4
2.2
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
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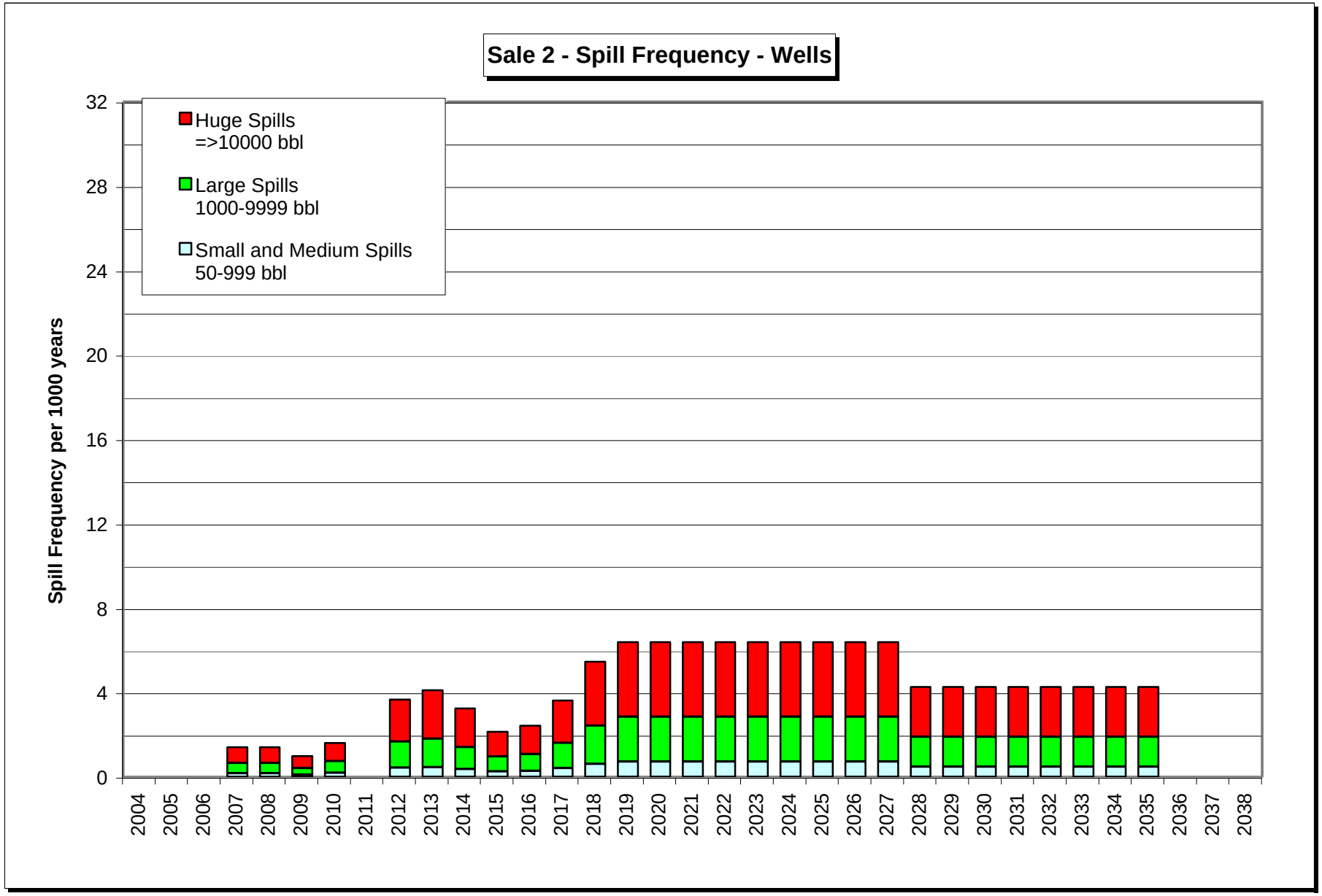
Sale 2 - Spill Frequency - Wells
Huge Spills
=>10000 bbl
Large Spills
1000-9999 bbl
Small and Medium Spills
50-999 bbl
Spill Frequency per 1000 years
0
4
8
12
16
20
24
28
32
2004
2005
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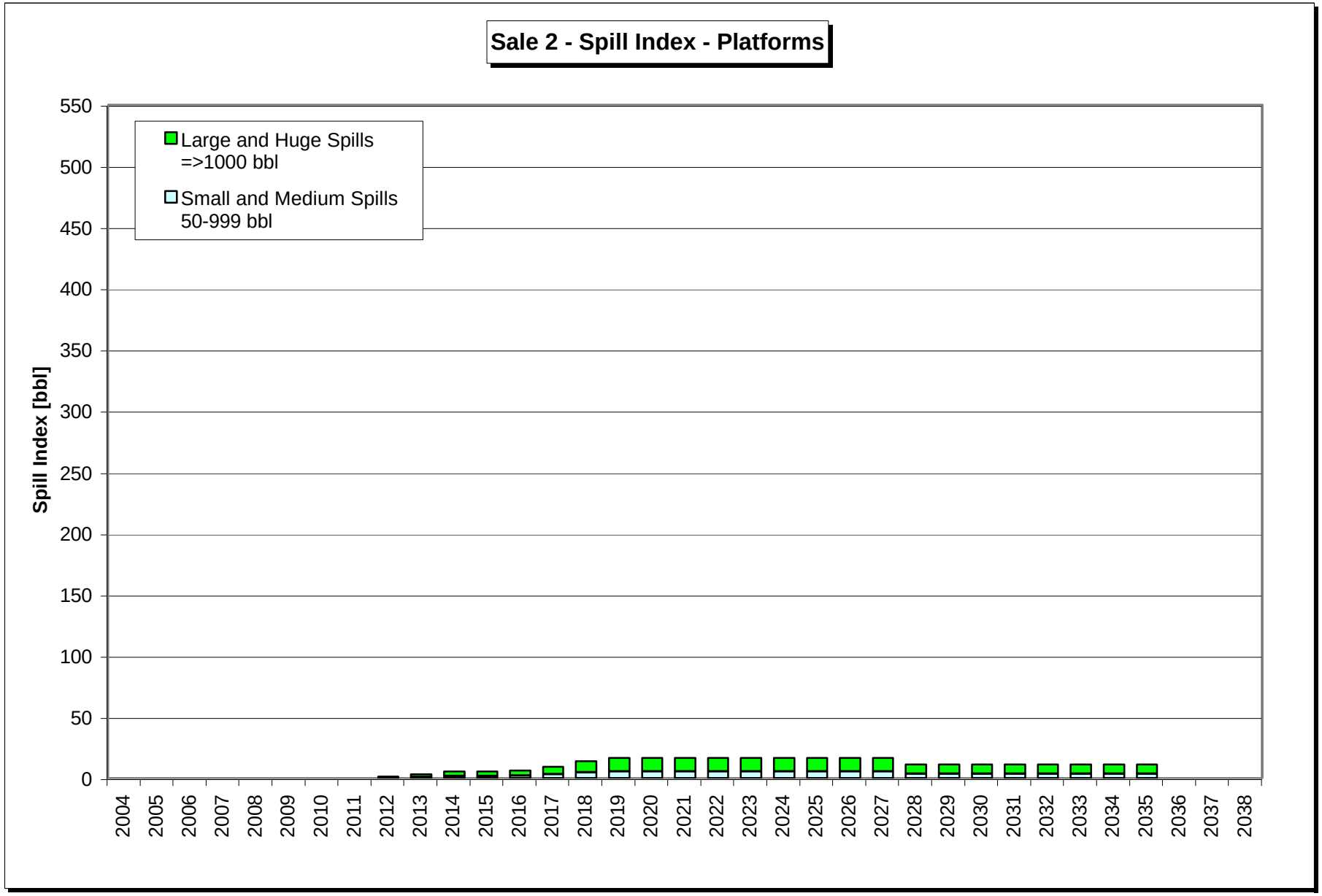
Sale 2 - Spill Index - Platforms
Large and Huge Spills =>1000 bbl
Small and Medium Spills 50-999 bbl
Spill Index [bbl]
550
500
450
400
350
300
250
200
150
100
50
0
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
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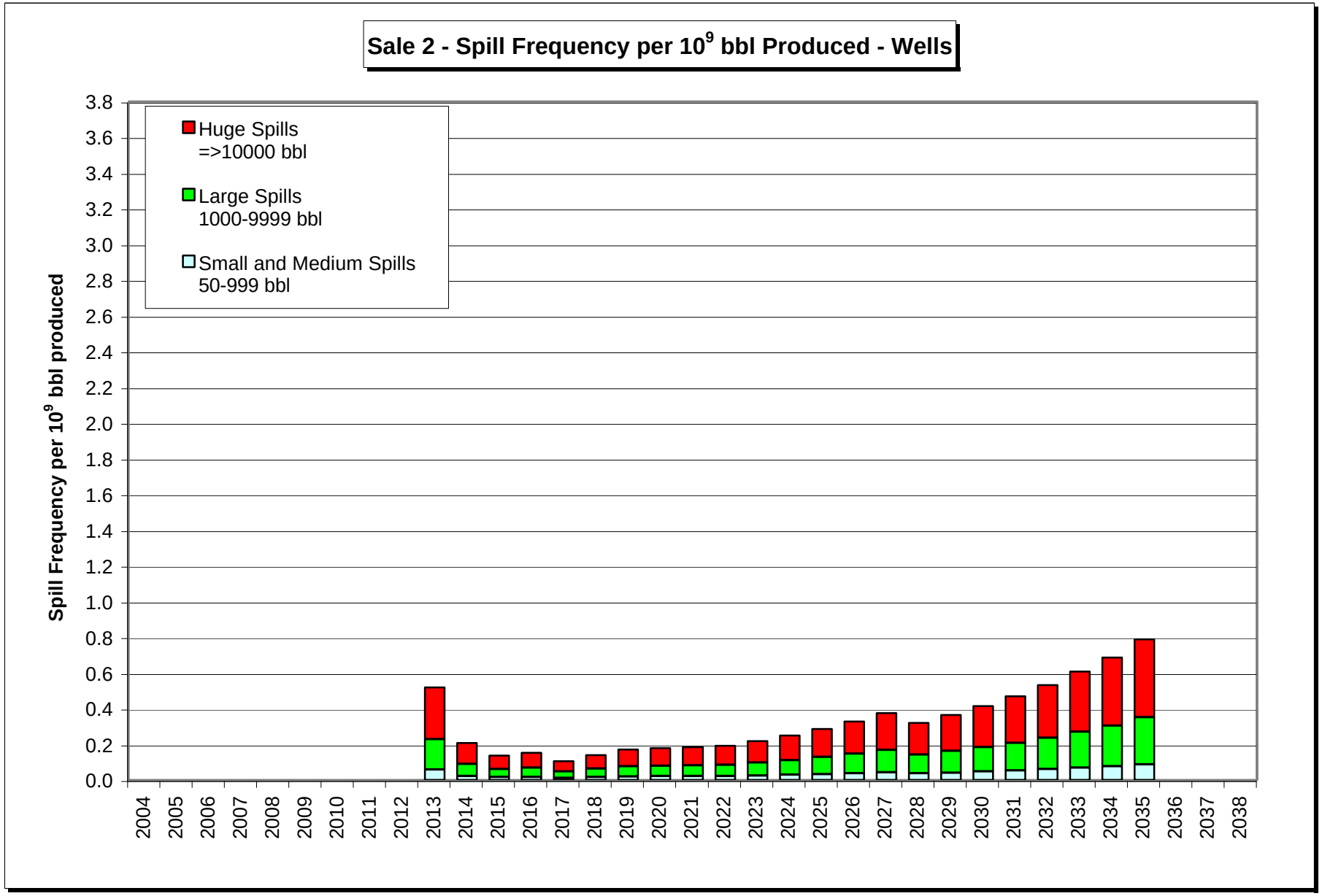
Sale 2 - Spill Frequency per 10^9 bbl Produced - Wells
Huge Spills
=>10000 bbl
Large Spills
1000-9999 bbl
Small and Medium Spills
50-999 bbl
Spill Frequency per 10^9 bbl produced
3.8
3.6
3.4
3.2
3.0
2.8
2.6
2.4
2.2
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
2004
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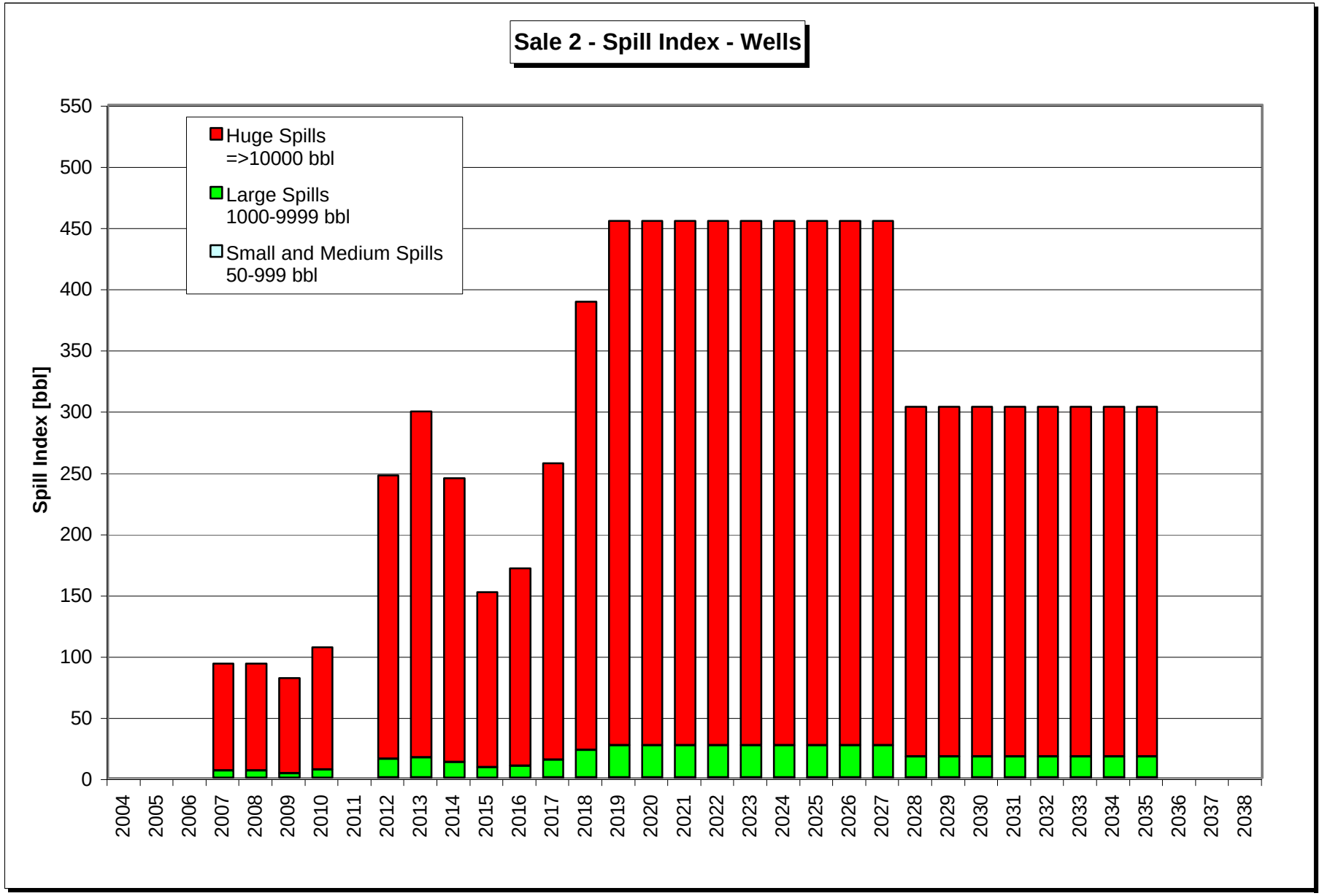
Sale 2 - Spill Index - Wells
Huge Spills
=>10000 bbl
Large Spills
1000-9999 bbl
Small and Medium Spills
50-999 bbl
Spill Index [bbl]
550
500
450
400
350
300
250
200
150
100
50
0
2004
2005
2006
2007
2008
2009
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2011
2012
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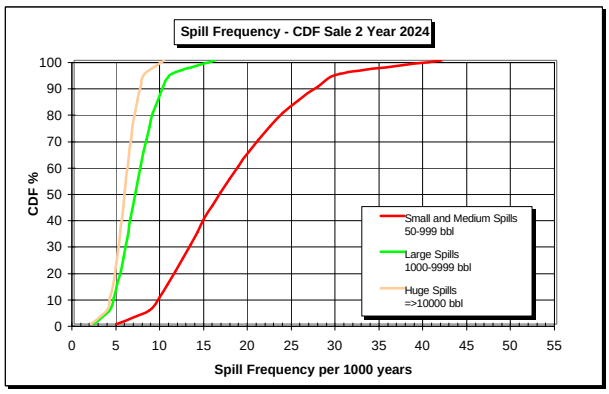
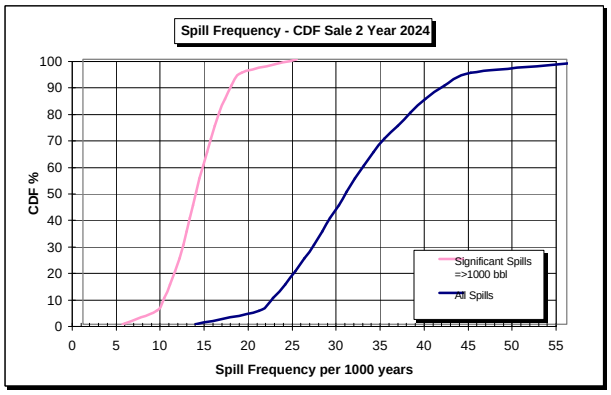
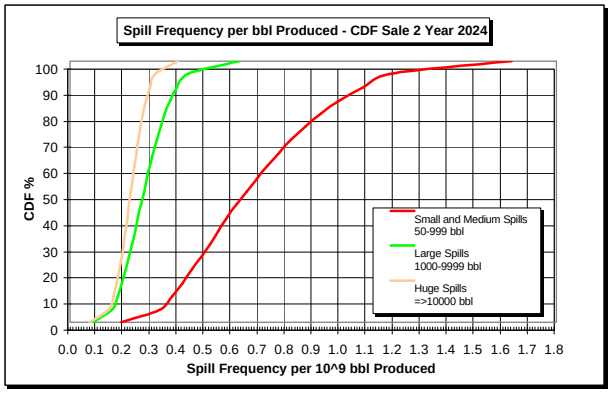
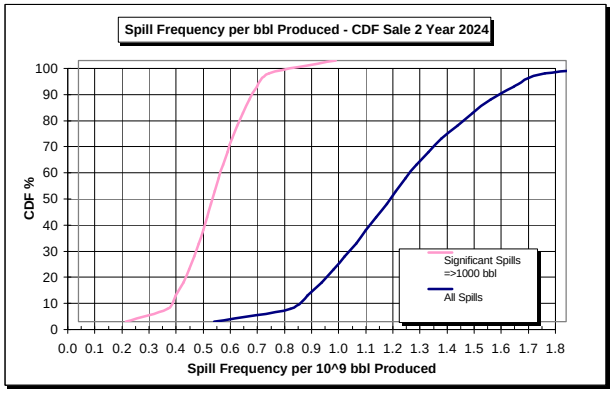
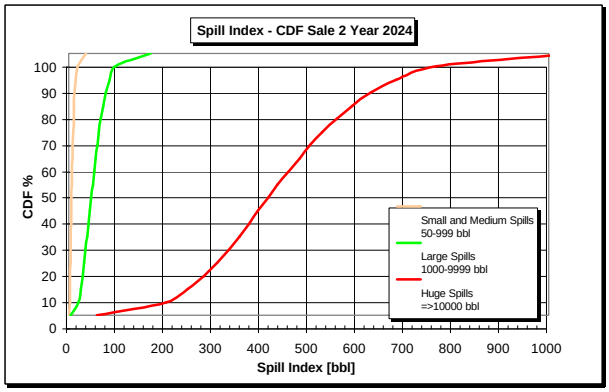
Figure 4.2.13 Spill Indicators - CDF - Year 2024











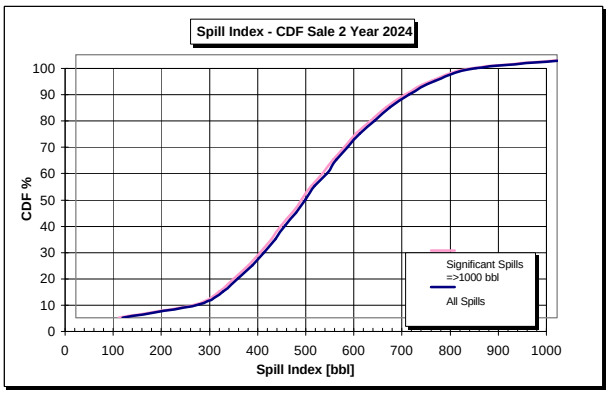


Figure 4.2.14 Spill Frequency - CDF - Sale 2

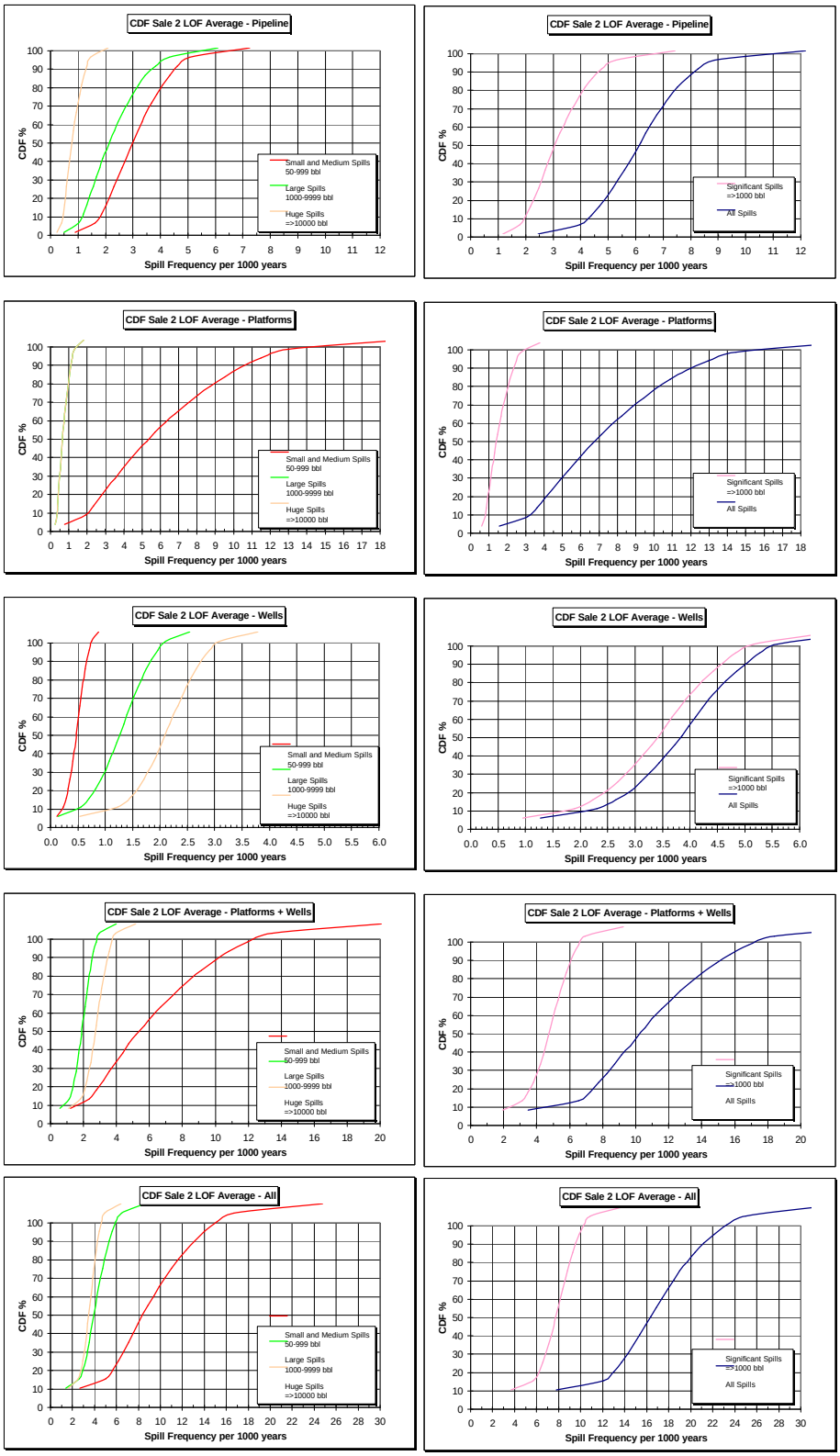


Figure 4.2.15 Spill Frequency per bbl produced - CDF - Sale 2

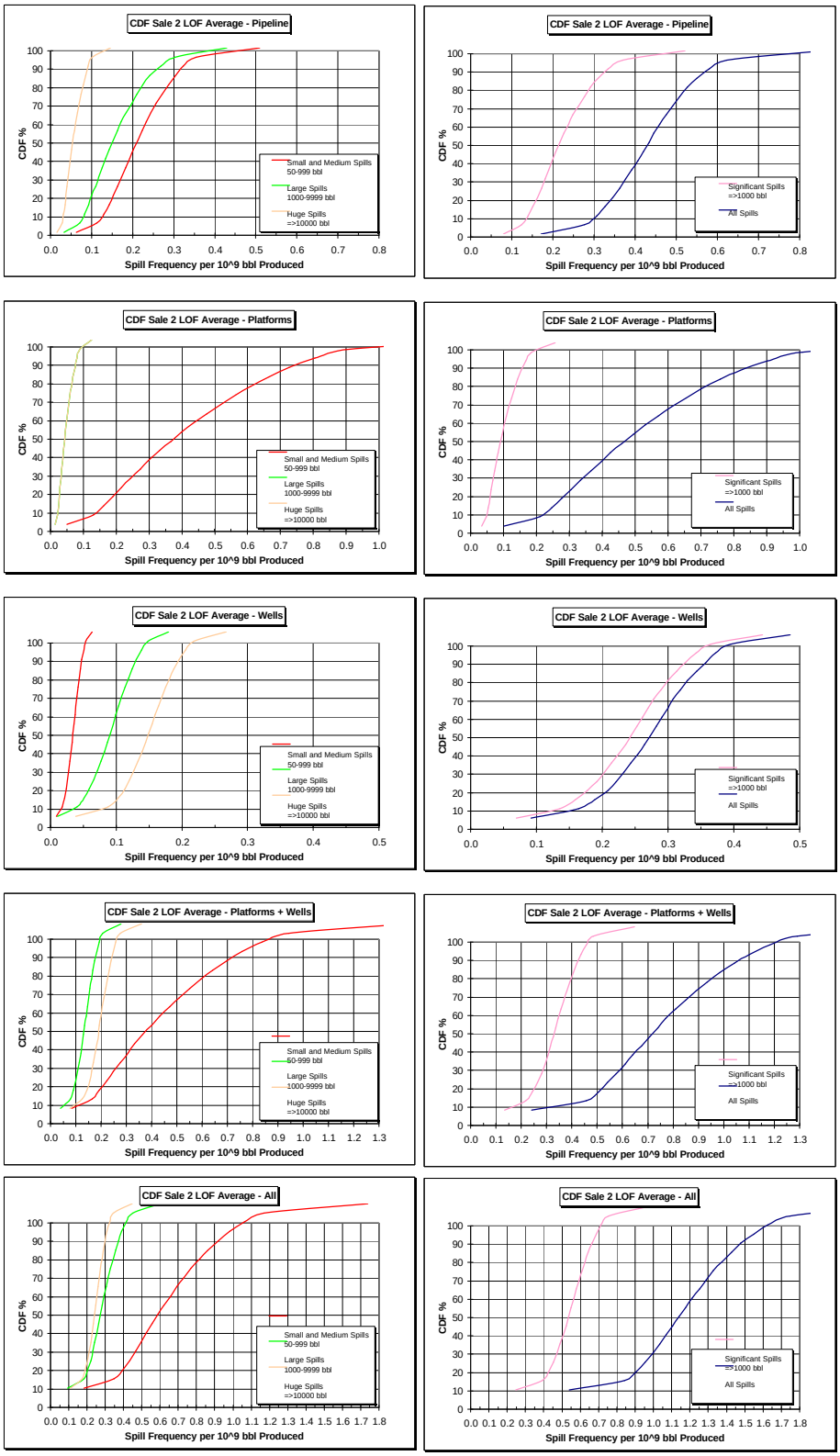


Figure 4.2.16 Spill Index [bbl] - CDF - Sale 2

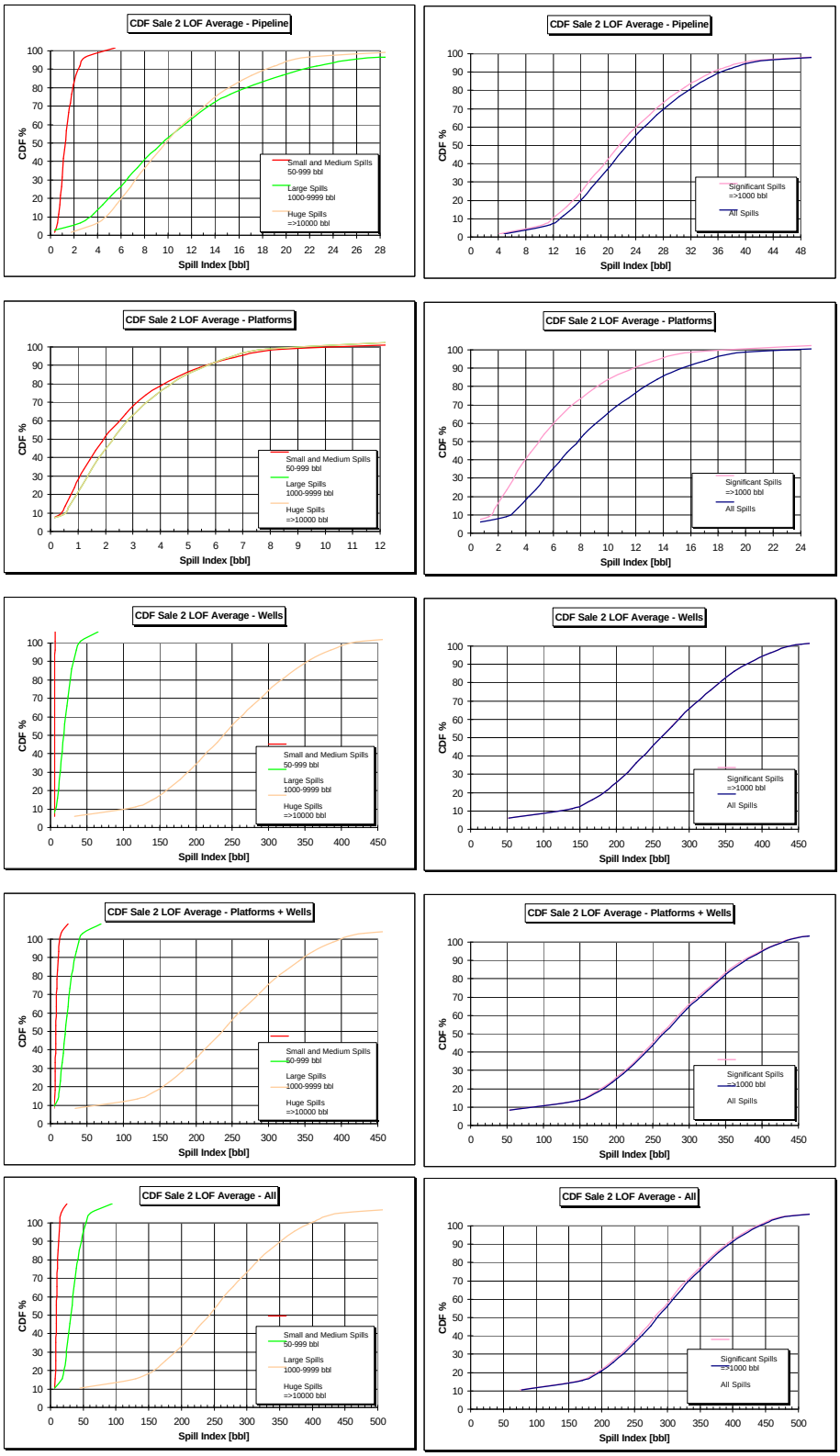
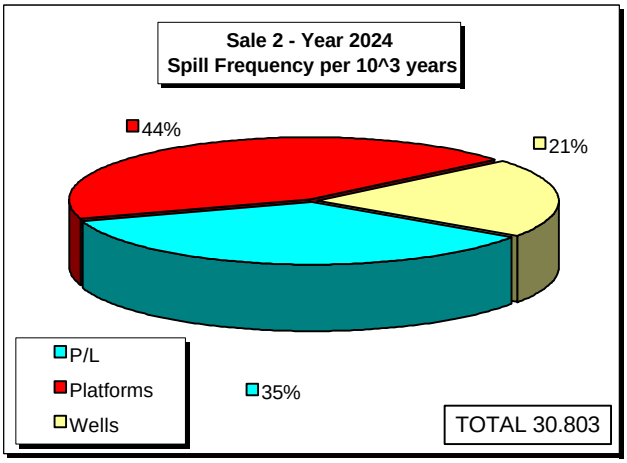
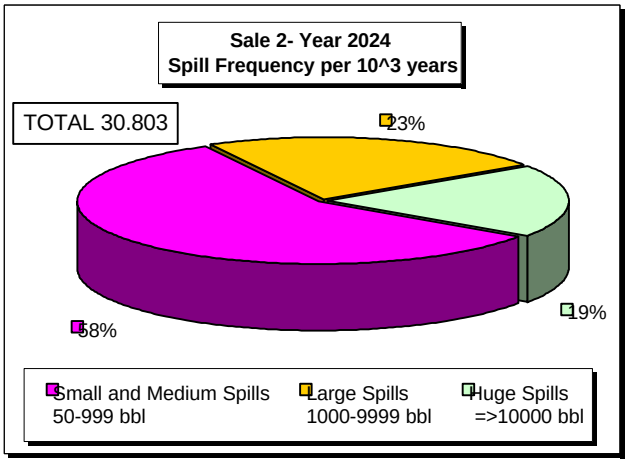


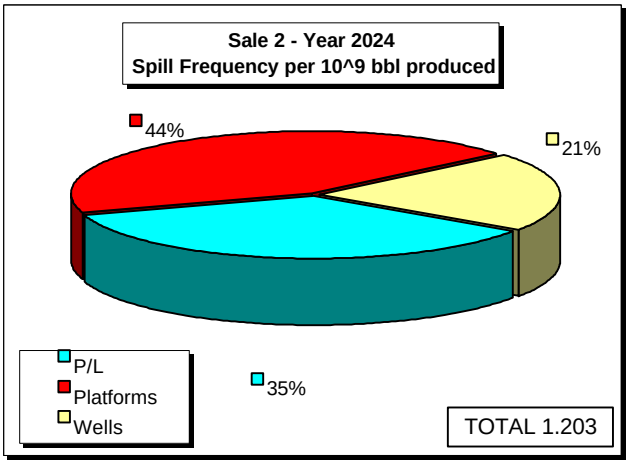
Figure 4.2.17
Sale 2 - Year 2024 - Spill Indicators

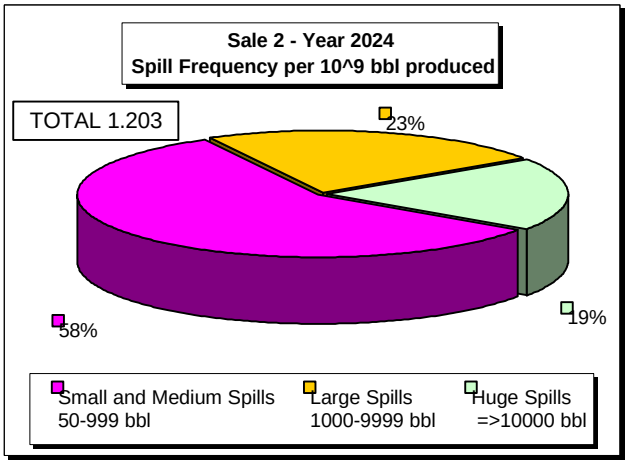
BY SPILL SOURCE

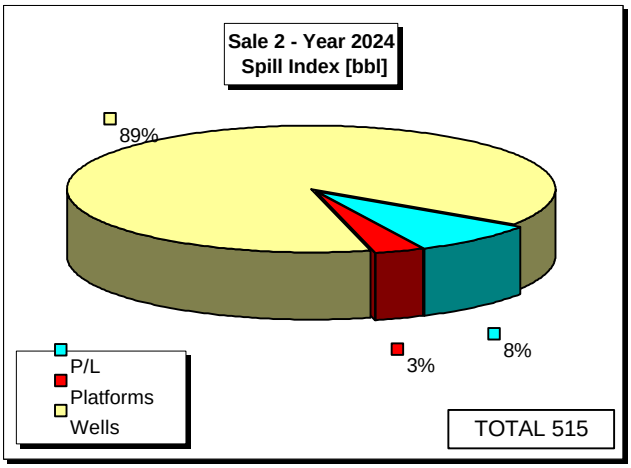


BY SPILL SIZE









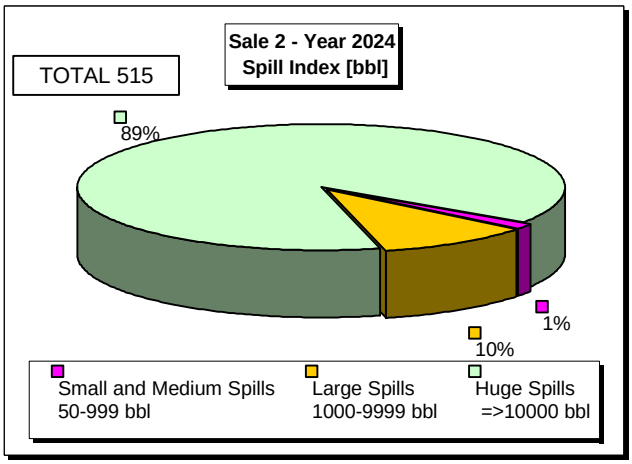
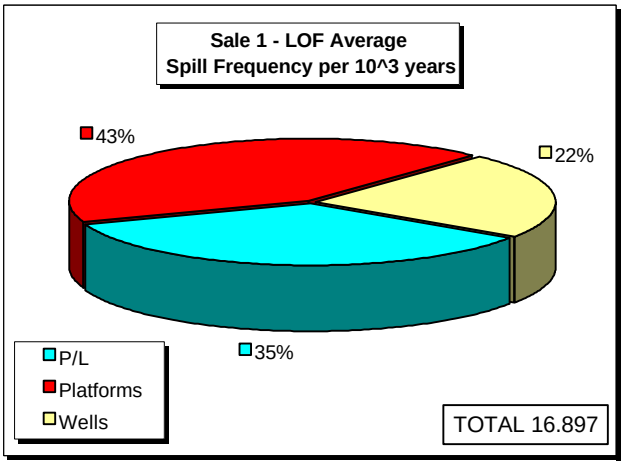
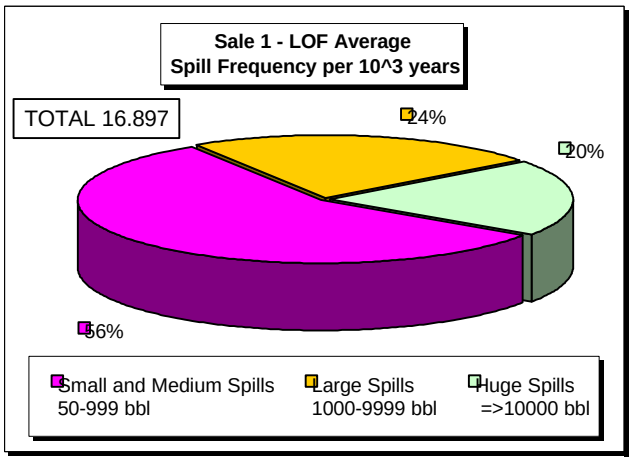


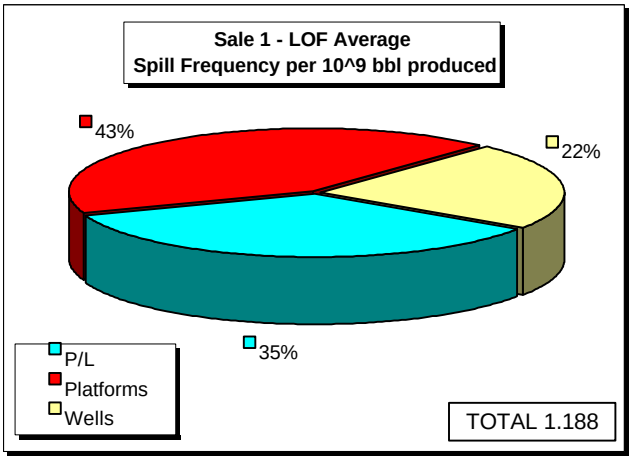
Figure 4.2.18
Sale 2 - LOF Average Spill Indicators

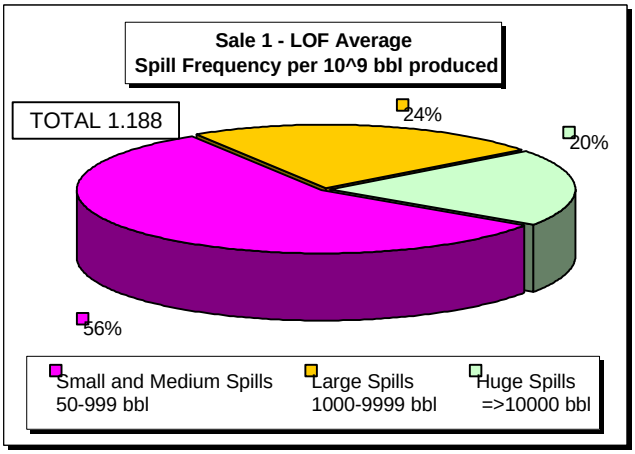
BY SPILL SOURCE

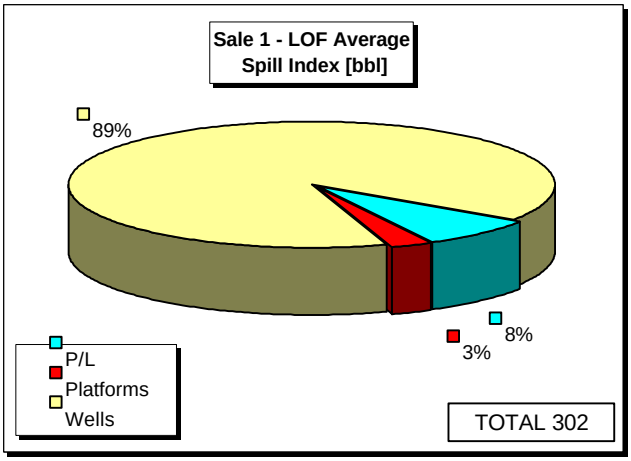


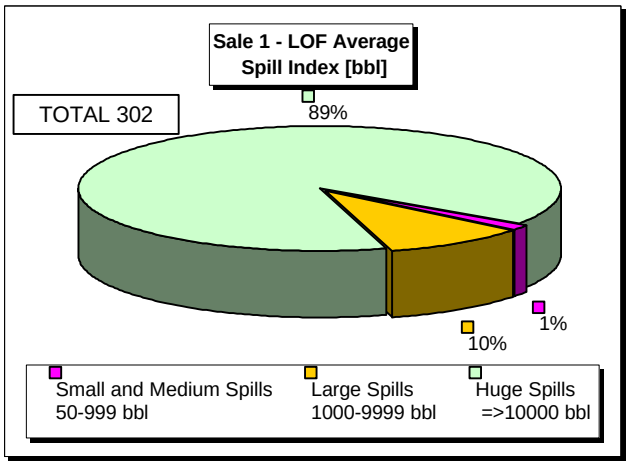
BY SPILL SIZE











APPENDIX 4
Spill Occurrence

4.3
Arctic Spill Occurrence
Beaufort Sea Sale 3

Table 4.3.1
Arctic Spill Occurrence Beaufort Sea Sale 3 P/L Spills

Year	Water Depth	P/L Dia <10"													P/L Dia >= 10"												
		P/L [miles]	Small Spills 50-99 bbl			Medium Spills 100-999 bbl			Large Spills 1000-9999 bbl			Huge Spills =>10000 bbl			P/L [miles]	Small Spills 50-99 bbl			Medium Spills 100-999 bbl			Large Spills 1000-9999 bbl			Huge Spills =>10000 bbl		
			Expected Spill [bbl] =		71	Expected Spill [bbl] =		485	Expected Spill [bbl] =		5279	Expected Spill [bbl] =		14880		Expected Spill [bbl] =		71	Expected Spill [bbl] =		516	Expected Spill [bbl] =		5176	Expected Spill [bbl] =		15552
		Cumm.	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl	Cumm.	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl
2004	Shallow		3.671			6.432			4.375			1.144				2.519			5.975			6.870			2.200		
	Medium		3.587			6.283			4.004			1.041				2.433			5.826			6.476			2.087		
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total																										
2005	Shallow		3.671			6.432			4.375			1.144				2.519			5.975			6.870			2.200		
	Medium		3.587			6.283			4.004			1.041				2.433			5.826			6.476			2.087		
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total																										
2006	Shallow		3.671			6.432			4.375			1.144				2.519			5.975			6.870			2.200		
	Medium		3.587			6.283			4.004			1.041				2.433			5.826			6.476			2.087		
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total																										
2007	Shallow		3.671			6.432			4.375			1.144				2.519			5.975			6.870			2.200		
	Medium		3.587			6.283			4.004			1.041				2.433			5.826			6.476			2.087		
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total																										
2008	Shallow		3.671			6.432			4.375			1.144				2.519			5.975			6.870			2.200		
	Medium		3.587			6.283			4.004			1.041				2.433			5.826			6.476			2.087		
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total																										
2009	Shallow		3.671			6.432			4.375			1.144				2.519			5.975			6.870			2.200		
	Medium		3.587			6.283			4.004			1.041				2.433			5.826			6.476			2.087		
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total																										
2010	Shallow		3.671			6.432			4.375			1.144				2.519			5.975			6.870			2.200		
	Medium		3.587			6.283			4.004			1.041				2.433			5.826			6.476			2.087		
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total																										
2011	Shallow		3.671			6.432			4.375			1.144				2.519			5.975			6.870			2.200		
	Medium		3.587			6.283			4.004			1.041				2.433			5.826			6.476			2.087		
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total																										
2012	Shallow		3.671			6.432			4.375			1.144				2.519			5.975			6.870			2.200		
	Medium		3.587			6.283			4.004			1.041				2.433			5.826			6.476			2.087		
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total																										
2013	Shallow		3.671			6.432			4.375			1.144				2.519			5.975			6.870			2.200		
	Medium		3.587			6.283			4.004			1.041				2.433			5.826			6.476			2.087		
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total																										
2014	Shallow		3.671			6.432			4.375			1.144				2.519			5.975			6.870			2.200		
	Medium		3.587			6.283			4.004			1.041				2.433			5.826			6.476			2.087		
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total																										
2015	Shallow		3.671			6.432			4.375			1.144				2.519			5.975			6.870			2.200		
	Medium		3.587			6.283			4.004			1.041				2.433			5.826			6.476			2.087		
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total																										
2016	Shallow		3.671			6.432			4.375			1.144				2.519			5.975			6.870			2.200		
	Medium		3.587			6.283			4.004			1.041				2.433			5.826			6.476			2.087		
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total																										
2017	Shallow		3.671			6.432			4.375			1.144				2.519			5.975			6.870			2.200		
	Medium		3.587			6.283			4.004			1.041				2.433			5.826			6.476			2.087		
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total																										
2018	Shallow		3.671			6.432			4.375			1.144				2.519			5.975			6.870			2.200		
	Medium		3.587			6.283			4.004			1.041				2.433			5.826			6.476			2.087		
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total																										
2019	Shallow		3.671			6.432			4.375			1.144			15	2.519	0.608	0.04	5.975	1.442	0.74	6.870	1.658	8.58	2.200	0.531	8.26
	Medium	5	3.587	0.289	0.02	6.283	0.505	0.25	4.004	0.322	1.70	1.041	0.084	1.25	15	2.433	0.587	0.04	5.826	1.406	0.73	6.476	1.563	8.09	2.087	0.504	7.83
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total	**5**		**0.289**	**0.02**		**0.505**	**0.25**		**0.322**	**1.70**		**0.084**	**1.25**	**30**		**1.195**	**0.09**		**2.848**	**1.47**		**3.221**	**16.67**		**1.035**	**16.09**
2020	Shallow		3.671			6.432			4.375			1.144			15	2.519	0.608	0.04	5.975	1.442	0.74	6.870	1.658	8.58	2.200	0.531	8.26
	Medium	5	3.587	0.289	0.02	6.283	0.505	0.25	4.004	0.322	1.70	1.041	0.084	1.25	15	2.433	0.587	0.04	5.826	1.406	0.73	6.476	1.563	8.09	2.087	0.504	7.83
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total	**5**		**0.289**	**0.02**		**0.505**	**0.25**		**0.322**	**1.70**		**0.084**	**1.25**	**30**		**1.195**	**0.09**		**2.848**	**1.47**		**3.221**	**16.67**		**1.035**	**16.09**
2021	Shallow		3.671			6.432			4.375			1.144			15	2.519	0.608	0.04	5.975	1.442	0.74	6.870	1.658	8.58	2.200	0.531	8.26
	Medium	5	3.587	0.289	0.02	6.283	0.505	0.25	4.004	0.322	1.70	1.041	0.084	1.25	15	2.433	0.587	0.04	5.826	1.406	0.73	6.476	1.563	8.09	2.087	0.504	7.83
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total	**5**		**0.289**	**0.02**		**0.505**	**0.25**		**0.322**	**1.70**		**0.084**	**1.25**	**30**		**1.195**	**0.09**		**2.848**	**1.47**		**3.221**	**16.67**		**1.035**	**16.09**
2022	Shallow		3.671			6.432			4.375			1.144			15	2.519	0.608	0.04	5.975	1.442	0.74	6.870	1.658	8.58	2.200	0.531	8.26
	Medium	5	3.587	0.289	0.02	6.283	0.505	0.25	4.004	0.322	1.70	1.041	0.084	1.25	15	2.433	0.587	0.04	5.826	1.406	0.73	6.476	1.563	8.09	2.087	0.504	7.83
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total	**5**		**0.289**	**0.02**		**0.505**	**0.25**		**0.322**	**1.70**		**0.084**	**1.25**	**30**		**1.195**	**0.09**		**2.848**	**1.47**		**3.221**	**16.67**		**1.035**	**16.09**
2023	Shallow		3.671			6.432			4.375			1.144			15	2.519	0.608	0.04	5.975	1.442	0.74	6.870	1.658	8.58	2.200	0.531	8.26
	Medium	5	3.587	0.289	0.02	6.283	0.505	0.25	4.004	0.322	1.70	1.041	0.084	1.25	15	2.433	0.587	0.04	5.826	1.406	0.73	6.476	1.563	8.09	2.087	0.504	7.83
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		

Table 4.3.1
Arctic Spill Occurrence Beaufort Sea Sale 3 P/L Spills

Year	Water Depth	P/L Dia <10"													P/L Dia >= 10"												
		P/L [miles]	Small Spills 50-99 bbl			Medium Spills 100-999 bbl			Large Spills 1000-9999 bbl			Huge Spills =>10000 bbl			P/L [miles]	Small Spills 50-99 bbl			Medium Spills 100-999 bbl			Large Spills 1000-9999 bbl			Huge Spills =>10000 bbl		
			Expected Spill [bbl] =		71	Expected Spill [bbl] =		485	Expected Spill [bbl] =		5279	Expected Spill [bbl] =		14880		Expected Spill [bbl] =		71	Expected Spill [bbl] =		516	Expected Spill [bbl] =		5176	Expected Spill [bbl] =		15552
		Cumm.	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl	Cumm.	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl
	Total	**5**		**0.289**	**0.02**		**0.505**	**0.25**		**0.322**	**1.70**		**0.084**	**1.25**	**30**		**1.195**	**0.09**		**2.848**	**1.47**		**3.221**	**16.67**		**1.035**	**16.09**
2024	Shallow		3.671			6.432			4.375			1.144			15	2.519	0.608	0.04	5.975	1.442	0.74	6.870	1.658	8.58	2.200	0.531	8.26
	Medium	5	3.587	0.289	0.02	6.283	0.505	0.25	4.004	0.322	1.70	1.041	0.084	1.25	15	2.433	0.587	0.04	5.826	1.406	0.73	6.476	1.563	8.09	2.087	0.504	7.83
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total	**5**		**0.289**	**0.02**		**0.505**	**0.25**		**0.322**	**1.70**		**0.084**	**1.25**	**30**		**1.195**	**0.09**		**2.848**	**1.47**		**3.221**	**16.67**		**1.035**	**16.09**
2025	Shallow		3.671			6.432			4.375			1.144			15	2.519	0.608	0.04	5.975	1.442	0.74	6.870	1.658	8.58	2.200	0.531	8.26
	Medium	5	3.587	0.289	0.02	6.283	0.505	0.25	4.004	0.322	1.70	1.041	0.084	1.25	15	2.433	0.587	0.04	5.826	1.406	0.73	6.476	1.563	8.09	2.087	0.504	7.83
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total	**5**		**0.289**	**0.02**		**0.505**	**0.25**		**0.322**	**1.70**		**0.084**	**1.25**	**30**		**1.195**	**0.09**		**2.848**	**1.47**		**3.221**	**16.67**		**1.035**	**16.09**
2026	Shallow		3.671			6.432			4.375			1.144			15	2.519	0.608	0.04	5.975	1.442	0.74	6.870	1.658	8.58	2.200	0.531	8.26
	Medium	5	3.587	0.289	0.02	6.283	0.505	0.25	4.004	0.322	1.70	1.041	0.084	1.25	15	2.433	0.587	0.04	5.826	1.406	0.73	6.476	1.563	8.09	2.087	0.504	7.83
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total	**5**		**0.289**	**0.02**		**0.505**	**0.25**		**0.322**	**1.70**		**0.084**	**1.25**	**30**		**1.195**	**0.09**		**2.848**	**1.47**		**3.221**	**16.67**		**1.035**	**16.09**
2027	Shallow		3.671			6.432			4.375			1.144			15	2.519	0.608	0.04	5.975	1.442	0.74	6.870	1.658	8.58	2.200	0.531	8.26
	Medium	5	3.587	0.289	0.02	6.283	0.505	0.25	4.004	0.322	1.70	1.041	0.084	1.25	15	2.433	0.587	0.04	5.826	1.406	0.73	6.476	1.563	8.09	2.087	0.504	7.83
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total	**5**		**0.289**	**0.02**		**0.505**	**0.25**		**0.322**	**1.70**		**0.084**	**1.25**	**30**		**1.195**	**0.09**		**2.848**	**1.47**		**3.221**	**16.67**		**1.035**	**16.09**
2028	Shallow		3.671			6.432			4.375			1.144			15	2.519	0.608	0.04	5.975	1.442	0.74	6.870	1.658	8.58	2.200	0.531	8.26
	Medium	5	3.587	0.289	0.02	6.283	0.505	0.25	4.004	0.322	1.70	1.041	0.084	1.25	15	2.433	0.587	0.04	5.826	1.406	0.73	6.476	1.563	8.09	2.087	0.504	7.83
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total	**5**		**0.289**	**0.02**		**0.505**	**0.25**		**0.322**	**1.70**		**0.084**	**1.25**	**30**		**1.195**	**0.09**		**2.848**	**1.47**		**3.221**	**16.67**		**1.035**	**16.09**
2029	Shallow		3.671			6.432			4.375			1.144			15	2.519	0.608	0.04	5.975	1.442	0.74	6.870	1.658	8.58	2.200	0.531	8.26
	Medium	5	3.587	0.289	0.02	6.283	0.505	0.25	4.004	0.322	1.70	1.041	0.084	1.25	15	2.433	0.587	0.04	5.826	1.406	0.73	6.476	1.563	8.09	2.087	0.504	7.83
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total	**5**		**0.289**	**0.02**		**0.505**	**0.25**		**0.322**	**1.70**		**0.084**	**1.25**	**30**		**1.195**	**0.09**		**2.848**	**1.47**		**3.221**	**16.67**		**1.035**	**16.09**
2030	Shallow		3.671			6.432			4.375			1.144			15	2.519	0.608	0.04	5.975	1.442	0.74	6.870	1.658	8.58	2.200	0.531	8.26
	Medium	5	3.587	0.289	0.02	6.283	0.505	0.25	4.004	0.322	1.70	1.041	0.084	1.25	15	2.433	0.587	0.04	5.826	1.406	0.73	6.476	1.563	8.09	2.087	0.504	7.83
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total	**5**		**0.289**	**0.02**		**0.505**	**0.25**		**0.322**	**1.70**		**0.084**	**1.25**	**30**		**1.195**	**0.09**		**2.848**	**1.47**		**3.221**	**16.67**		**1.035**	**16.09**
2031	Shallow		3.671			6.432			4.375			1.144			15	2.519	0.608	0.04	5.975	1.442	0.74	6.870	1.658	8.58	2.200	0.531	8.26
	Medium	5	3.587	0.289	0.02	6.283	0.505	0.25	4.004	0.322	1.70	1.041	0.084	1.25	15	2.433	0.587	0.04	5.826	1.406	0.73	6.476	1.563	8.09	2.087	0.504	7.83
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total	**5**		**0.289**	**0.02**		**0.505**	**0.25**		**0.322**	**1.70**		**0.084**	**1.25**	**30**		**1.195**	**0.09**		**2.848**	**1.47**		**3.221**	**16.67**		**1.035**	**16.09**
2032	Shallow		3.671			6.432			4.375			1.144			15	2.519	0.608	0.04	5.975	1.442	0.74	6.870	1.658	8.58	2.200	0.531	8.26
	Medium	5	3.587	0.289	0.02	6.283	0.505	0.25	4.004	0.322	1.70	1.041	0.084	1.25	15	2.433	0.587	0.04	5.826	1.406	0.73	6.476	1.563	8.09	2.087	0.504	7.83
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total	**5**		**0.289**	**0.02**		**0.505**	**0.25**		**0.322**	**1.70**		**0.084**	**1.25**	**30**		**1.195**	**0.09**		**2.848**	**1.47**		**3.221**	**16.67**		**1.035**	**16.09**
2033	Shallow		3.671			6.432			4.375			1.144			15	2.519	0.608	0.04	5.975	1.442	0.74	6.870	1.658	8.58	2.200	0.531	8.26
	Medium	5	3.587	0.289	0.02	6.283	0.505	0.25	4.004	0.322	1.70	1.041	0.084	1.25	15	2.433	0.587	0.04	5.826	1.406	0.73	6.476	1.563	8.09	2.087	0.504	7.83
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total	**5**		**0.289**	**0.02**		**0.505**	**0.25**		**0.322**	**1.70**		**0.084**	**1.25**	**30**		**1.195**	**0.09**		**2.848**	**1.47**		**3.221**	**16.67**		**1.035**	**16.09**
2034	Shallow		3.671			6.432			4.375			1.144			15	2.519	0.608	0.04	5.975	1.442	0.74	6.870	1.658	8.58	2.200	0.531	8.26
	Medium	5	3.587	0.289	0.02	6.283	0.505	0.25	4.004	0.322	1.70	1.041	0.084	1.25	15	2.433	0.587	0.04	5.826	1.406	0.73	6.476	1.563	8.09	2.087	0.504	7.83
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total	**5**		**0.289**	**0.02**		**0.505**	**0.25**		**0.322**	**1.70**		**0.084**	**1.25**	**30**		**1.195**	**0.09**		**2.848**	**1.47**		**3.221**	**16.67**		**1.035**	**16.09**
2035	Shallow		3.671			6.432			4.375			1.144			15	2.519	0.608	0.04	5.975	1.442	0.74	6.870	1.658	8.58	2.200	0.531	8.26
	Medium	5	3.587	0.289	0.02	6.283	0.505	0.25	4.004	0.322	1.70	1.041	0.084	1.25	15	2.433	0.587	0.04	5.826	1.406	0.73	6.476	1.563	8.09	2.087	0.504	7.83
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total	**5**		**0.289**	**0.02**		**0.505**	**0.25**		**0.322**	**1.70**		**0.084**	**1.25**	**30**		**1.195**	**0.09**		**2.848**	**1.47**		**3.221**	**16.67**		**1.035**	**16.09**
2036	Shallow		3.671			6.432			4.375			1.144			15	2.519	0.608	0.04	5.975	1.442	0.74	6.870	1.658	8.58	2.200	0.531	8.26
	Medium	5	3.587	0.289	0.02	6.283	0.505	0.25	4.004	0.322	1.70	1.041	0.084	1.25	15	2.433	0.587	0.04	5.826	1.406	0.73	6.476	1.563	8.09	2.087	0.504	7.83
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total	**5**		**0.289**	**0.02**		**0.505**	**0.25**		**0.322**	**1.70**		**0.084**	**1.25**	**30**		**1.195**	**0.09**		**2.848**	**1.47**		**3.221**	**16.67**		**1.035**	**16.09**
2037	Shallow		3.671			6.432			4.375			1.144			15	2.519	0.608	0.04	5.975	1.442	0.74	6.870	1.658	8.58	2.200	0.531	8.26
	Medium	5	3.587	0.289	0.02	6.283	0.505	0.25	4.004	0.322	1.70	1.041	0.084	1.25	15	2.433	0.587	0.04	5.826	1.406	0.73	6.476	1.563	8.09	2.087	0.504	7.83
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total	**5**		**0.289**	**0.02**		**0.505**	**0.25**		**0.322**	**1.70**		**0.084**	**1.25**	**30**		**1.195**	**0.09**		**2.848**	**1.47**		**3.221**	**16.67**		**1.035**	**16.09**
2038	Shallow		3.671			6.432			4.375			1.144			15	2.519	0.608	0.04	5.975	1.442	0.74	6.870	1.658	8.58	2.200	0.531	8.26
	Medium	5	3.587	0.289	0.02	6.283	0.505	0.25	4.004	0.322	1.70	1.041	0.084	1.25	15	2.433	0.587	0.04	5.826	1.406	0.73	6.476	1.563	8.09	2.087	0.504	7.83
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total	**5**		**0.289**	**0.02**		**0.505**	**0.25**		**0.322**	**1.70**		**0.084**	**1.25**	**30**		**1.195**	**0.09**		**2.848**	**1.47**		**3.221**	**16.67**		**1.035**	**16.09**

Table 4.3.2
Arctic Spill Occurrence - Sale 3 - P/L - Summary

Year	Production [MMbbl]	Small Spills 50-99 bbl			Medium Spills 100-999 bbl			Small and Medium Spills 50-999 bbl			Large Spills 1000-9999 bbl			Huge Spills =>10000 bbl			Significant Spills =>1000 bbl			All Spills		
		Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 103years	Frequency Spills per 109 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]
2004																						
2005																						
2006																						
2007																						
2008																						
2009																						
2010																						
2011																						
2012																						
2013																						
2014																						
2015																						
2016																						
2017																						
2018																						
2019	30.8	1.484	0.048	0.106	3.354	0.109	1.715	4.837	0.157	1.820	3.543	0.115	18.372	1.118	0.036	17.336	4.662	0.151	35.708	9.499	0.308	37.529
2020	38.6	1.484	0.038	0.106	3.354	0.087	1.715	4.837	0.125	1.820	3.543	0.092	18.372	1.118	0.029	17.336	4.662	0.121	35.708	9.499	0.246	37.529
2021	38.6	1.484	0.038	0.106	3.354	0.087	1.715	4.837	0.125	1.820	3.543	0.092	18.372	1.118	0.029	17.336	4.662	0.121	35.708	9.499	0.246	37.529
2022	38.6	1.484	0.038	0.106	3.354	0.087	1.715	4.837	0.125	1.820	3.543	0.092	18.372	1.118	0.029	17.336	4.662	0.121	35.708	9.499	0.246	37.529
2023	38.6	1.484	0.038	0.106	3.354	0.087	1.715	4.837	0.125	1.820	3.543	0.092	18.372	1.118	0.029	17.336	4.662	0.121	35.708	9.499	0.246	37.529
2024	38.6	1.484	0.038	0.106	3.354	0.087	1.715	4.837	0.125	1.820	3.543	0.092	18.372	1.118	0.029	17.336	4.662	0.121	35.708	9.499	0.246	37.529
2025	34.0	1.484	0.044	0.106	3.354	0.099	1.715	4.837	0.142	1.820	3.543	0.104	18.372	1.118	0.033	17.336	4.662	0.137	35.708	9.499	0.279	37.529
2026	29.9	1.484	0.050	0.106	3.354	0.112	1.715	4.837	0.162	1.820	3.543	0.119	18.372	1.118	0.037	17.336	4.662	0.156	35.708	9.499	0.318	37.529
2027	26.3	1.484	0.056	0.106	3.354	0.128	1.715	4.837	0.184	1.820	3.543	0.135	18.372	1.118	0.043	17.336	4.662	0.177	35.708	9.499	0.361	37.529
2028	23.2	1.484	0.064	0.106	3.354	0.145	1.715	4.837	0.209	1.820	3.543	0.153	18.372	1.118	0.048	17.336	4.662	0.201	35.708	9.499	0.409	37.529
2029	20.4	1.484	0.073	0.106	3.354	0.164	1.715	4.837	0.237	1.820	3.543	0.174	18.372	1.118	0.055	17.336	4.662	0.229	35.708	9.499	0.466	37.529
2030	17.9	1.484	0.083	0.106	3.354	0.187	1.715	4.837	0.270	1.820	3.543	0.198	18.372	1.118	0.062	17.336	4.662	0.260	35.708	9.499	0.531	37.529
2031	15.8	1.484	0.094	0.085	3.354	0.212	1.470	4.837	0.306	1.555	3.543	0.224	16.672	1.118	0.071	16.090	4.662	0.295	32.761	9.499	0.601	34.316
2032	13.9	1.484	0.107	0.106	3.354	0.241	1.715	4.837	0.348	1.820	3.543	0.255	18.372	1.118	0.080	17.336	4.662	0.335	35.708	9.499	0.683	37.529
2033	12.2	1.484	0.122	0.106	3.354	0.275	1.715	4.837	0.397	1.820	3.543	0.290	18.372	1.118	0.092	17.336	4.662	0.382	35.708	9.499	0.779	37.529
2034	10.8	1.484	0.137	0.106	3.354	0.311	1.715	4.837	0.448	1.820	3.543	0.328	18.372	1.118	0.104	17.336	4.66	0.43	35.71	9.499	0.880	37.529
2035	9.5	1.484	0.156	0.106	3.354	0.353	1.715	4.837	0.509	1.820	3.543	0.373	18.372	1.118	0.118	17.336	4.66	0.49	35.71	9.499	1.000	37.529
2036	8.3	1.484	0.179	0.106	3.354	0.404	1.715	4.837	0.583	1.820	3.543	0.427	18.372	1.118	0.135	17.336	4.66	0.56	35.71	9.499	1.144	37.529
2037	7.3	1.484	0.203	0.106	3.354	0.459	1.715	4.837	0.663	1.820	3.543	0.485	18.372	1.118	0.153	17.336	4.66	0.64	35.71	9.499	1.301	37.529
2038	6.5	1.484	0.228	0.106	3.354	0.516	1.715	4.837	0.744	1.820	3.543	0.545	18.372	1.118	0.172	17.336	4.66	0.72	35.71	9.499	1.461	37.529
Total LOF	459.8	29.674		2	67.074		34	96.748		36	70.866		366	22.367		345	93.233		711	189.981		747
Average LOF		1.023	0.065	0	2.313	0.146	1	3.336	0.210	1	2.444	0.154	13	0.771	0.049	12	3.215	0.203	25	6.551	0.413	26

Table 4.3.3
Arctic Spill Occurrence - Sale 3 - Platforms

Year	Water Depth	N Platforms	N P Wells	Small and Medium Spills 50-999 bbl			Large and Huge Spills =>1000 bbl		
				Expected Spill [bbl] =		**452**	Expected Spill [bbl] =		**5631**
		Cum.	Cum.	Frequency spills per 10^4well-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4well-year	Frequency spills per 10^3years	Spill Index bbl
2004	Shallow			1.619			0.274		
	Medium			1.704			0.288		
	Deep			1.828			0.309		
	Total								
2005	Shallow			1.619			0.274		
	Medium			1.704			0.288		
	Deep			1.828			0.309		
	Total								
2006	Shallow			1.619			0.274		
	Medium			1.704			0.288		
	Deep			1.828			0.309		
	Total								
2007	Shallow			1.619			0.274		
	Medium			1.704			0.288		
	Deep			1.828			0.309		
	Total								
2008	Shallow			1.619			0.274		
	Medium			1.704			0.288		
	Deep			1.828			0.309		
	Total								
2009	Shallow			1.619			0.274		
	Medium			1.704			0.288		
	Deep			1.828			0.309		
	Total								
2010	Shallow			1.619			0.274		
	Medium			1.704			0.288		
	Deep			1.828			0.309		
	Total								
2011	Shallow			1.619			0.274		
	Medium			1.704			0.288		
	Deep			1.828			0.309		
	Total								
2012	Shallow			1.619			0.274		
	Medium			1.704			0.288		
	Deep			1.828			0.309		
	Total								
2013	Shallow			1.619			0.274		
	Medium			1.704			0.288		
	Deep			1.828			0.309		
	Total								
2014	Shallow			1.619			0.274		
	Medium			1.704			0.288		
	Deep			1.828			0.309		
	Total								
2015	Shallow			1.619			0.274		
	Medium			1.704			0.288		
	Deep			1.828			0.309		
	Total								
2016	Shallow			1.619			0.274		
	Medium			1.704			0.288		
	Deep			1.828			0.309		
	Total								
2017	Shallow			1.619			0.274		
	Medium			1.704			0.288		
	Deep			1.828			0.309		
	Total								
2018	Shallow			1.619			0.274		
	Medium	1	4	1.704	0.681	0.31	0.288	0.115	0.65
	Deep			1.828			0.309		
	Total	**1**	**4**		**0.681**	**0.31**		**0.115**	**0.65**
2019	Shallow			1.619			0.274		
	Medium	2	18	1.704	3.067	1.39	0.288	0.519	2.92
	Deep			1.828			0.309		
	Total	**2**	**18**		**3.067**	**1.39**		**0.519**	**2.92**
2020	Shallow			1.619			0.274		
	Medium	2	38	1.704	6.474	2.93	0.288	1.096	6.17
	Deep			1.828			0.309		
	Total	**2**	**38**		**6.474**	**2.93**		**1.096**	**6.17**
2021	Shallow			1.619			0.274		
	Medium	2	58	1.704	9.881	4.47	0.288	1.672	9.42
	Deep			1.828			0.309		
	Total	**2**	**58**		**9.881**	**4.47**		**1.672**	**9.42**
2022	Shallow			1.619			0.274		
	Medium	2	68	1.704	11.585	5.24	0.288	1.961	11.04
	Deep			1.828			0.309		
	Total	**2**	**68**		**11.585**	**5.24**		**1.961**	**11.04**
2023	Shallow			1.619			0.274		
	Medium	2	68	1.704	11.585	5.24	0.288	1.961	11.04
	Deep			1.828			0.309		
	Total	**2**	**68**		**11.585**	**5.24**		**1.961**	**11.04**
2024	Shallow			1.619			0.274		
	Medium	2	68	1.704	11.585	5.24	0.288	1.961	11.04

Table 4.3.3
Arctic Spill Occurrence - Sale 3 - Platforms

Year	Water Depth	N Platforms	N P Wells	Small and Medium Spills 50-999 bbl			Large and Huge Spills =>1000 bbl		
				Expected Spill [bbl] =		**452**	Expected Spill [bbl] =		**5631**
		Cum.	Cum.	Frequency spills per 10^4well-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4well-year	Frequency spills per 10^3years	Spill Index bbl
2024	Deep			1.828			0.309		
	Total	**2**	**68**		**11.585**	**5.24**		**1.961**	**11.04**
2025	Shallow			1.619			0.274		
	Medium	2	68	1.704	11.585	5.24	0.288	1.961	11.04
	Deep			1.828			0.309		
	Total	**2**	**68**		**11.585**	**5.24**		**1.961**	**11.04**
2026	Shallow			1.619			0.274		
	Medium	2	68	1.704	11.585	5.24	0.288	1.961	11.04
	Deep			1.828			0.309		
	Total	**2**	**68**		**11.585**	**5.24**		**1.961**	**11.04**
2027	Shallow			1.619			0.274		
	Medium	2	68	1.704	11.585	5.24	0.288	1.961	11.04
	Deep			1.828			0.309		
	Total	**2**	**68**		**11.585**	**5.24**		**1.961**	**11.04**
2028	Shallow			1.619			0.274		
	Medium	2	68	1.704	11.585	5.24	0.288	1.961	11.04
	Deep			1.828			0.309		
	Total	**2**	**68**		**11.585**	**5.24**		**1.961**	**11.04**
2029	Shallow			1.619			0.274		
	Medium	2	68	1.704	11.585	5.24	0.288	1.961	11.04
	Deep			1.828			0.309		
	Total	**2**	**68**		**11.585**	**5.24**		**1.961**	**11.04**
2030	Shallow			1.619			0.274		
	Medium	2	68	1.704	11.585	5.24	0.288	1.961	11.04
	Deep			1.828			0.309		
	Total	**2**	**68**		**11.585**	**5.24**		**1.961**	**11.04**
2031	Shallow			1.619			0.274		
	Medium	2	68	1.704	11.585	5.24	0.288	1.961	11.04
	Deep			1.828			0.309		
	Total	**2**	**68**		**11.585**	**5.24**		**1.961**	**11.04**
2032	Shallow			1.619			0.274		
	Medium	2	68	1.704	11.585	5.24	0.288	1.961	11.04
	Deep			1.828			0.309		
	Total	**2**	**68**		**11.585**	**5.24**		**1.961**	**11.04**
2033	Shallow			1.619			0.274		
	Medium	2	68	1.704	11.585	5.24	0.288	1.961	11.04
	Deep			1.828			0.309		
	Total	**2**	**68**		**11.585**	**5.24**		**1.961**	**11.04**
2034	Shallow			1.619			0.274		
	Medium	2	68	1.704	11.585	5.24	0.288	1.961	11.04
	Deep			1.828			0.309		
	Total	**2**	**68**		**11.585**	**5.24**		**1.961**	**11.04**
2035	Shallow			1.619			0.274		
	Medium	2	68	1.704	11.585	5.24	0.288	1.961	11.04
	Deep			1.828			0.309		
	Total	**2**	**68**		**11.585**	**5.24**		**1.961**	**11.04**
2036	Shallow			1.619			0.274		
	Medium	2	68	1.704	11.585	5.24	0.288	1.961	11.04
	Deep			1.828			0.309		
	Total	**2**	**68**		**11.585**	**5.24**		**1.961**	**11.04**
2037	Shallow			1.619			0.274		
	Medium	2	68	1.704	11.585	5.24	0.288	1.961	11.04
	Deep			1.828			0.309		
	Total	**2**	**68**		**11.585**	**5.24**		**1.961**	**11.04**
2038	Shallow			1.619			0.274		
	Medium	2	68	1.704	11.585	5.24	0.288	1.961	11.04
	Deep			1.828			0.309		
	Total	**2**	**68**		**11.585**	**5.24**		**1.961**	**11.04**

Table 4.3.4
Arctic Spill Occurrence - Sale 3 - Platforms - Summary

Year	Production [MMbbl]	Small and Medium Spills 50-999 bbl			Large and Huge Spills =>1000 bbl			Significant Spills =>1000 bbl			All Spills		
		Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 103years	Frequency Spills per 109 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]
2004													
2005													
2006													
2007													
2008													
2009													
2010													
2011													
2012													
2013													
2014													
2015													
2016													
2017													
2018		0.681		0.308	0.115		0.649	0.115		0.649	0.797		0.957
2019	**30.8**	3.067	0.100	1.386	0.519	0.017	2.923	0.519	0.017	2.923	3.586	0.116	4.308
2020	**38.6**	6.474	0.168	2.926	1.096	0.028	6.170	1.096	0.028	6.170	7.570	0.196	9.096
2021	**38.6**	9.881	0.256	4.466	1.672	0.043	9.417	1.672	0.043	9.417	11.554	0.299	13.883
2022	**38.6**	11.585	0.300	5.235	1.961	0.051	11.041	1.961	0.051	11.041	13.546	0.351	16.276
2023	**38.6**	11.585	0.300	5.235	1.961	0.051	11.041	1.961	0.051	11.041	13.546	0.351	16.276
2024	**38.6**	11.585	0.300	5.235	1.961	0.051	11.041	1.961	0.051	11.041	13.546	0.351	16.276
2025	**34.0**	11.585	0.341	5.235	1.961	0.058	11.041	1.961	0.058	11.041	13.546	0.398	16.276
2026	**29.9**	11.585	0.387	5.235	1.961	0.066	11.041	1.961	0.066	11.041	13.546	0.453	16.276
2027	**26.3**	11.585	0.440	5.235	1.961	0.075	11.041	1.961	0.075	11.041	13.546	0.515	16.276
2028	**23.2**	11.585	0.499	5.235	1.961	0.085	11.041	1.961	0.085	11.041	13.546	0.584	16.276
2029	**20.4**	11.585	0.568	5.235	1.961	0.096	11.041	1.961	0.096	11.041	13.546	0.664	16.276
2030	**17.9**	11.585	0.647	5.235	1.961	0.110	11.041	1.961	0.110	11.041	13.546	0.757	16.276
2031	**15.8**	11.585	0.733	5.235	1.961	0.124	11.041	1.961	0.124	11.041	13.546	0.857	16.276
2032	**13.9**	11.585	0.833	5.235	1.961	0.141	11.041	1.961	0.141	11.041	13.546	0.975	16.276
2033	**12.2**	11.585	0.950	5.235	1.961	0.161	11.041	1.961	0.161	11.041	13.546	1.110	16.276
2034	**10.8**	11.585	1.073	5.235	1.961	0.182	11.041	13.55	1.25	16.28	13.546	1.254	16.276
2035	**9.5**	11.585	1.219	5.235	1.961	0.206	11.041	13.55	1.43	16.28	13.546	1.426	16.276
2036	**8.3**	11.585	1.396	5.235	1.961	0.236	11.041	13.55	1.63	16.28	13.546	1.632	16.276
2037	**7.3**	11.585	1.587	5.235	1.961	0.269	11.041	13.55	1.86	16.28	13.546	1.856	16.276
2038	**6.5**	11.585	1.782	5.235	1.961	0.302	11.041	13.55	2.08	16.28	13.546	2.084	16.276
Total LOF	**459.8**	**217.047**		**98**	**36.735**		**207**	**94.659**		**233**	**253.782**		**305**
Average LOF		**7.484**	**0.472**	**3**	**1.267**	**0.080**	**7**	**3.264**	**0.206**	**8**	**8.751**	**0.552**	**11**

Table 4.3.5
Arctic Spill Occurrence - Sale 3 - Production Wells

Year	Water Depth	Production Wells Blowout												
		N Wells	Small and Medium Spills 50-999 bbl			Large Spills 1000-9999 bbl			Spills 10000-149999 bbl			Spills =>150000 bbl		
			Expected Spill [bbl] =		519	Expected Spill [bbl] =		5292	Expected Spill [bbl] =		68349	Expected Spill [bbl] =		200000
		Cum.	Frequency spills per 10^4well-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4well-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4well-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4well-year	Frequency spills per 10^3years	Spill Index bbl
2004	Shallow		0.103			0.718			0.308			0.205		
	Medium		0.103			0.718			0.308			0.205		
	Deep		0.103			0.718			0.308			0.205		
	Total													
2005	Shallow		0.103			0.718			0.308			0.205		
	Medium		0.103			0.718			0.308			0.205		
	Deep		0.103			0.718			0.308			0.205		
	Total													
2006	Shallow		0.103			0.718			0.308			0.205		
	Medium		0.103			0.718			0.308			0.205		
	Deep		0.103			0.718			0.308			0.205		
	Total													
2007	Shallow		0.103			0.718			0.308			0.205		
	Medium		0.103			0.718			0.308			0.205		
	Deep		0.103			0.718			0.308			0.205		
	Total													
2008	Shallow		0.103			0.718			0.308			0.205		
	Medium		0.103			0.718			0.308			0.205		
	Deep		0.103			0.718			0.308			0.205		
	Total													
2009	Shallow		0.103			0.718			0.308			0.205		
	Medium		0.103			0.718			0.308			0.205		
	Deep		0.103			0.718			0.308			0.205		
	Total													
2010	Shallow		0.103			0.718			0.308			0.205		
	Medium		0.103			0.718			0.308			0.205		
	Deep		0.103			0.718			0.308			0.205		
	Total													
2011	Shallow		0.103			0.718			0.308			0.205		
	Medium		0.103			0.718			0.308			0.205		
	Deep		0.103			0.718			0.308			0.205		
	Total													
2012	Shallow		0.103			0.718			0.308			0.205		
	Medium		0.103			0.718			0.308			0.205		
	Deep		0.103			0.718			0.308			0.205		
	Total													
2013	Shallow		0.103			0.718			0.308			0.205		
	Medium		0.103			0.718			0.308			0.205		
	Deep		0.103			0.718			0.308			0.205		
	Total													
2014	Shallow		0.103			0.718			0.308			0.205		
	Medium		0.103			0.718			0.308			0.205		
	Deep		0.103			0.718			0.308			0.205		
	Total													
2015	Shallow		0.103			0.718			0.308			0.205		
	Medium		0.103			0.718			0.308			0.205		
	Deep		0.103			0.718			0.308			0.205		
	Total													
2016	Shallow		0.103			0.718			0.308			0.205		
	Medium		0.103			0.718			0.308			0.205		
	Deep		0.103			0.718			0.308			0.205		
	Total													
2017	Shallow		0.103			0.718			0.308			0.205		
	Medium		0.103			0.718			0.308			0.205		
	Deep		0.103			0.718			0.308			0.205		
	Total													
2018	Shallow		0.103			0.718			0.308			0.205		
	Medium	4	0.103	0.041	0.02	0.718	0.287	1.52	0.308	0.123	8.42	0.205	0.082	16.42
	Deep		0.103			0.718			0.308			0.205		
	Total	**4**		0.041	**0.02**		0.287	**1.52**		0.123	**8.42**		0.082	**16.42**
2019	Shallow		0.103			0.718			0.308			0.205		
	Medium	18	0.103	0.185	0.10	0.718	1.293	6.84	0.308	0.554	37.87	0.205	0.369	73.88
	Deep		0.103			0.718			0.308			0.205		
	Total	**18**		0.185	**0.10**		1.293	**6.84**		0.554	**37.87**		0.369	**73.88**
2020	Shallow		0.103			0.718			0.308			0.205		
	Medium	38	0.103	0.390	0.20	0.718	2.730	14.44	0.308	1.170	79.95	0.205	0.780	155.97
	Deep		0.103			0.718			0.308			0.205		
	Total	**38**		0.390	**0.20**		2.730	**14.44**		1.170	**79.95**		0.780	**155.97**
2021	Shallow		0.103			0.718			0.308			0.205		
	Medium	58	0.103	0.595	0.31	0.718	4.166	22.05	0.308	1.785	122.03	0.205	1.190	238.06
	Deep		0.103			0.718			0.308			0.205		
	Total	**58**		0.595	**0.31**		4.166	**22.05**		1.785	**122.03**		1.190	**238.06**

Table 4.3.5
Arctic Spill Occurrence - Sale 3 - Production Wells

Year	Water Depth	Production Wells Blowout												
		N Wells	Small and Medium Spills 50-999 bbl			Large Spills 1000-9999 bbl			Spills 10000-149999 bbl			Spills =>150000 bbl		
			Expected Spill [bbl] =		519	Expected Spill [bbl] =		5292	Expected Spill [bbl] =		68349	Expected Spill [bbl] =		200000
		Cum.	Frequency spills per 10^4well-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4well-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4well-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4well-year	Frequency spills per 10^3years	Spill Index bbl
2022	Shallow		0.103			0.718			0.308			0.205		
	Medium	68	0.103	0.698	0.36	0.718	4.884	25.85	0.308	2.093	143.08	0.205	1.396	279.11
	Deep		0.103			0.718			0.308			0.205		
	Total	**68**		0.698	**0.36**		4.884	**25.85**		2.093	**143.08**		1.396	**279.11**
2023	Shallow		0.103			0.718			0.308			0.205		
	Medium	68	0.103	0.698	0.36	0.718	4.884	25.85	0.308	2.093	143.08	0.205	1.396	279.11
	Deep		0.103			0.718			0.308			0.205		
	Total	**68**		0.698	**0.36**		4.884	**25.85**		2.093	**143.08**		1.396	**279.11**
2024	Shallow		0.103			0.718			0.308			0.205		
	Medium	68	0.103	0.698	0.36	0.718	4.884	25.85	0.308	2.093	143.08	0.205	1.396	279.11
	Deep		0.103			0.718			0.308			0.205		
	Total	**68**		0.698	**0.36**		4.884	**25.85**		2.093	**143.08**		1.396	**279.11**
2025	Shallow		0.103			0.718			0.308			0.205		
	Medium	68	0.103	0.698	0.36	0.718	4.884	25.85	0.308	2.093	143.08	0.205	1.396	279.11
	Deep		0.103			0.718			0.308			0.205		
	Total	**68**		0.698	**0.36**		4.884	**25.85**		2.093	**143.08**		1.396	**279.11**
2026	Shallow		0.103			0.718			0.308			0.205		
	Medium	68	0.103	0.698	0.36	0.718	4.884	25.85	0.308	2.093	143.08	0.205	1.396	279.11
	Deep		0.103			0.718			0.308			0.205		
	Total	**68**		0.698	**0.36**		4.884	**25.85**		2.093	**143.08**		1.396	**279.11**
2027	Shallow		0.103			0.718			0.308			0.205		
	Medium	68	0.103	0.698	0.36	0.718	4.884	25.85	0.308	2.093	143.08	0.205	1.396	279.11
	Deep		0.103			0.718			0.308			0.205		
	Total	**68**		0.698	**0.36**		4.884	**25.85**		2.093	**143.08**		1.396	**279.11**
2028	Shallow		0.103			0.718			0.308			0.205		
	Medium	68	0.103	0.698	0.36	0.718	4.884	25.85	0.308	2.093	143.08	0.205	1.396	279.11
	Deep		0.103			0.718			0.308			0.205		
	Total	**68**		0.698	**0.36**		4.884	**25.85**		2.093	**143.08**		1.396	**279.11**
2029	Shallow		0.103			0.718			0.308			0.205		
	Medium	68	0.103	0.698	0.36	0.718	4.884	25.85	0.308	2.093	143.08	0.205	1.396	279.11
	Deep		0.103			0.718			0.308			0.205		
	Total	**68**		0.698	**0.36**		4.884	**25.85**		2.093	**143.08**		1.396	**279.11**
2030	Shallow		0.103			0.718			0.308			0.205		
	Medium	68	0.103	0.698	0.36	0.718	4.884	25.85	0.308	2.093	143.08	0.205	1.396	279.11
	Deep		0.103			0.718			0.308			0.205		
	Total	**68**		0.698	**0.36**		4.884	**25.85**		2.093	**143.08**		1.396	**279.11**
2031	Shallow		0.103			0.718			0.308			0.205		
	Medium	68	0.103	0.698	0.36	0.718	4.884	25.85	0.308	2.093	143.08	0.205	1.396	279.11
	Deep		0.103			0.718			0.308			0.205		
	Total	**68**		0.698	**0.36**		4.884	**25.85**		2.093	**143.08**		1.396	**279.11**
2032	Shallow		0.103			0.718			0.308			0.205		
	Medium	68	0.103	0.698	0.36	0.718	4.884	25.85	0.308	2.093	143.08	0.205	1.396	279.11
	Deep		0.103			0.718			0.308			0.205		
	Total	**68**		0.698	**0.36**		4.884	**25.85**		2.093	**143.08**		1.396	**279.11**
2033	Shallow		0.103			0.718			0.308			0.205		
	Medium	68	0.103	0.698	0.36	0.718	4.884	25.85	0.308	2.093	143.08	0.205	1.396	279.11
	Deep		0.103			0.718			0.308			0.205		
	Total	**68**		0.698	**0.36**		4.884	**25.85**		2.093	**143.08**		1.396	**279.11**
2034	Shallow		0.103			0.718			0.308			0.205		
	Medium	68	0.103	0.698	0.36	0.718	4.884	25.85	0.308	2.093	143.08	0.205	1.396	279.11
	Deep		0.103			0.718			0.308			0.205		
	Total	**68**		0.698	**0.36**		4.884	**25.85**		2.093	**143.08**		1.396	**279.11**
2035	Shallow		0.103			0.718			0.308			0.205		
	Medium	68	0.103	0.698	0.36	0.718	4.884	25.85	0.308	2.093	143.08	0.205	1.396	279.11
	Deep		0.103			0.718			0.308			0.205		
	Total	**68**		0.698	**0.36**		4.884	**25.85**		2.093	**143.08**		1.396	**279.11**
2036	Shallow		0.103			0.718			0.308			0.205		
	Medium	68	0.103	0.698	0.36	0.718	4.884	25.85	0.308	2.093	143.08	0.205	1.396	279.11
	Deep		0.103			0.718			0.308			0.205		
	Total	**68**		0.698	**0.36**		4.884	**25.85**		2.093	**143.08**		1.396	**279.11**
2037	Shallow		0.103			0.718			0.308			0.205		
	Medium	68	0.103	0.698	0.36	0.718	4.884	25.85	0.308	2.093	143.08	0.205	1.396	279.11
	Deep		0.103			0.718			0.308			0.205		
	Total	**68**		0.698	**0.36**		4.884	**25.85**		2.093	**143.08**		1.396	**279.11**
2038	Shallow		0.103			0.718			0.308			0.205		
	Medium	68	0.103	0.698	0.36	0.718	4.884	25.85	0.308	2.093	143.08	0.205	1.396	279.11
	Deep		0.103			0.718			0.308			0.205		
	Total	**68**		0.698	**0.36**		4.884	**25.85**		2.093	**143.08**		1.396	**279.11**

Table 4.3.6
Arctic Spill Occurrence - Sale 3 - Production Wells - Summary

Year	Production [MMbbl]	Small and Medium Spills 50-99 bbl			Large Spills 1000-9999 bbl			Huge Spills =>10000 bbl			All Spills		
		Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]
2004													
2005													
2006													
2007													
2008													
2009													
2010													
2011													
2012													
2013													
2014													
2015													
2016													
2017													
2018		0.041		0.021	0.123		1.521	0.205		24.834	0.369		26.376
2019	**30.8**	0.185	0.006	0.096	0.554	0.018	6.842	0.924	0.030	111.755	1.662	0.054	118.693
2020	**38.6**	0.390	0.010	0.203	1.170	0.030	14.445	1.950	0.051	235.926	3.509	0.091	250.574
2021	**38.6**	0.595	0.015	0.309	1.785	0.046	22.047	2.976	0.077	360.098	5.356	0.139	382.455
2022	**38.6**	0.698	0.018	0.362	2.093	0.054	25.849	3.489	0.090	422.184	6.280	0.163	448.395
2023	**38.6**	0.698	0.018	0.362	2.093	0.054	25.849	3.489	0.090	422.184	6.280	0.163	448.395
2024	**38.6**	0.698	0.018	0.362	2.093	0.054	25.849	3.489	0.090	422.184	6.280	0.163	448.395
2025	**34.0**	0.698	0.021	0.362	2.093	0.062	25.849	3.489	0.103	422.184	6.280	0.185	448.395
2026	**29.9**	0.698	0.023	0.362	2.093	0.070	25.849	3.489	0.117	422.184	6.280	0.210	448.395
2027	**26.3**	0.698	0.027	0.362	2.093	0.080	25.849	3.489	0.133	422.184	6.280	0.239	448.395
2028	**23.2**	0.698	0.030	0.362	2.093	0.090	25.849	3.489	0.150	422.184	6.280	0.271	448.395
2029	**20.4**	0.698	0.034	0.362	2.093	0.103	25.849	3.489	0.171	422.184	6.280	0.308	448.395
2030	**17.9**	0.698	0.039	0.362	2.093	0.117	25.849	3.489	0.195	422.184	6.280	0.351	448.395
2031	**15.8**	0.698	0.044	0.362	2.093	0.132	25.849	3.489	0.221	422.184	6.280	0.397	448.395
2032	**13.9**	0.698	0.050	0.362	2.093	0.151	25.849	3.489	0.251	422.184	6.280	0.452	448.395
2033	**12.2**	0.698	0.057	0.362	2.093	0.172	25.849	3.489	0.286	422.184	6.280	0.515	448.395
2034	**10.8**	0.698	0.065	0.362	2.093	0.194	25.849	3.489	0.323	422.184	6.280	0.581	448.395
2035	**9.5**	0.698	0.073	0.362	2.093	0.220	25.849	3.489	0.367	422.184	6.280	0.661	448.395
2036	**8.3**	0.698	0.084	0.362	2.093	0.252	25.849	3.489	0.420	422.184	6.280	0.757	448.395
2037	**7.3**	0.698	0.096	0.362	2.093	0.287	25.849	3.489	0.478	422.184	6.280	0.860	448.395
2038	**6.5**	0.698	0.107	0.362	2.093	0.322	25.849	3.489	0.537	422.184	6.280	0.966	448.395

Table 4.3.7
Occurrence Spill Risks - Sale 3 - Exploration Wells

Year	Water Depth	Exploration Wells Blowout												
		N Wells	Small and Medium Spills 50-999 bbl			Large Spills 1000-9999 bbl			Spills 10000-149999 bbl			Spills =>150000 bbl		
			Expected Spill [bbl] =		519	Expected Spill [bbl] =		5292	Expected Spill [bbl] =		68349	Expected Spill [bbl] =		200000
		Cum.	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl
2004	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2005	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2006	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2007	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2008	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2009	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2010	Shallow	1	1.583	0.158	0.08	11.077	1.108	5.86	4.759	0.476	32.53	2.755	0.276	55.11
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total	**1**		0.158	**0.08**		1.108	**5.86**		0.476	**32.53**		0.276	**55.11**
2011	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2012	Shallow		1.583			11.077			4.759			2.755		
	Medium	1	1.809	0.181	0.09	12.659	1.266	6.70	5.439	0.544	37.18	3.149	0.315	62.98
	Deep		2.035			14.242			6.119			3.543		
	Total	**1**		0.181	**0.09**		1.266	**6.70**		0.544	**37.18**		0.315	**62.98**
2013	Shallow		1.583			11.077			4.759			2.755		
	Medium	1	1.809	0.181	0.09	12.659	1.266	6.70	5.439	0.544	37.18	3.149	0.315	62.98
	Deep		2.035			14.242			6.119			3.543		
	Total	**1**		0.181	**0.09**		1.266	**6.70**		0.544	**37.18**		0.315	**62.98**
2014	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2015	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep	1	2.035	0.204	0.11	14.242	1.424	7.54	6.119	0.612	41.82	3.543	0.354	70.85
	Total	**1**		0.204	**0.11**		1.424	**7.54**		0.612	**41.82**		0.354	**70.85**
2016	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2017	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep	1	2.035	0.204	0.11	14.242	1.424	7.54	6.119	0.612	41.82	3.543	0.354	70.85
	Total	**1**		0.204	**0.11**		1.424	**7.54**		0.612	**41.82**		0.354	**70.85**
2018	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep	1	2.035	0.204	0.11	14.242	1.424	7.54	6.119	0.612	41.82	3.543	0.354	70.85
	Total	**1**		0.204	**0.11**		1.424	**7.54**		0.612	**41.82**		0.354	**70.85**
2019	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2020	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2021	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2022	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2023	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2024	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2025	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2026	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2027	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2028	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2029	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													

Table 4.3.7
Occurrence Spill Risks - Sale 3 - Exploration Wells

Year	Water Depth	Exploration Wells Blowout												
		N Wells	Small and Medium Spills 50-999 bbl			Large Spills 1000-9999 bbl			Spills 10000-149999 bbl			Spills =>150000 bbl		
			Expected Spill [bbl] =		**519**	Expected Spill [bbl] =		**5292**	Expected Spill [bbl] =		**68349**	Expected Spill [bbl] =		**200000**
		Cum.	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl
2030	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2031	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2032	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2033	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2034	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2035	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2036	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2037	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2038	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													

Table 4.3.8
Arctic Spill Occurrence - Sale 3 - Exploration Wells - Summary

Year	Production [MMbbl]	Small and Medium Spills 50-99 bbl			Large Spills 1000-9999 bbl			Huge Spills =>10000 bbl			All Spills		
		Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]
2004													
2005													
2006													
2007													
2008													
2009													
2010		0.158		0.082	0.476		5.862	0.751		87.639	1.386		93.583
2011													
2012		0.181		0.094	0.544		6.699	0.859		100.159	1.584		106.952
2013		0.181		0.094	0.544		6.699	0.859		100.159	1.584		106.952
2014													
2015		0.204		0.106	0.612		7.537	0.966		112.679	1.782		120.321
2016													
2017		0.204		0.106	0.612		7.537	0.966		112.679	1.782		120.321
2018		0.204		0.106	0.612		7.537	0.966		112.679	1.782		120.321
2019	**30.8**												
2020	**38.6**												
2021	**38.6**												
2022	**38.6**												
2023	**38.6**												
2024	**38.6**												
2025	**34.0**												
2026	**29.9**												
2027	**26.3**												
2028	**23.2**												
2029	**20.4**												
2030	**17.9**												
2031	**15.8**												
2032	**13.9**												
2033	**12.2**												
2034	**10.8**												
2035	**9.5**												
2036	**8.3**												
2037	**7.3**												
2038	**6.5**												

Table 4.3.9
Arctic Spill Occurrence Beaufort Sea Sale 3 Development Wells

Year	Water Depth	Development Wells Blowout												
		N Wells	Small and Medium Spills 50-999 bbl			Large Spills 1000-9999 bbl			Spills 10000-149999 bbl			Spills =>150000 bbl		
			Expected Spill [bbl] =		519	Expected Spill [bbl] =		5292	Expected Spill [bbl] =		68349	Expected Spill [bbl] =		200000
		Cum.	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl
2004	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2005	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2006	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2007	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2008	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2009	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2010	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2011	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2012	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2013	Shallow		0.484			3.383			1.453			1.453		
	Medium	1	0.554	0.055	0.03	3.867	0.387	2.05	1.661	0.166	11.35	1.661	0.166	33.22
	Deep		0.623			4.350			1.868			1.868		
	Total	**1**		0.055	**0.03**		0.387	**2.05**		0.166	**11.35**		0.166	**33.22**
2014	Shallow		0.484			3.383			1.453			1.453		
	Medium	2	0.554	0.111	0.06	3.867	0.773	4.09	1.661	0.332	22.70	1.661	0.332	66.43
	Deep		0.623			4.350			1.868			1.868		
	Total	**2**		0.111	**0.06**		0.773	**4.09**		0.332	**22.70**		0.332	**66.43**
2015	Shallow		0.484			3.383			1.453			1.453		
	Medium	2	0.554	0.111	0.06	3.867	0.773	4.09	1.661	0.332	22.70	1.661	0.332	66.43
	Deep		0.623			4.350			1.868			1.868		
	Total	**2**		0.111	**0.06**		0.773	**4.09**		0.332	**22.70**		0.332	**66.43**
2016	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2017	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2018	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2019	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2020	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2021	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2022	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2023	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2024	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2025	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2026	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2027	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2028	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2029	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													

Table 4.3.9
Arctic Spill Occurrence Beaufort Sea Sale 3 Development Wells

Year	Water Depth	Development Wells Blowout												
		N Wells	Small and Medium Spills 50-999 bbl			Large Spills 1000-9999 bbl			Spills 10000-149999 bbl			Spills =>150000 bbl		
			Expected Spill [bbl] =		**519**	Expected Spill [bbl] =		**5292**	Expected Spill [bbl] =		**68349**	Expected Spill [bbl] =		**200000**
		Cum.	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl
2030	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2031	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2032	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2033	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2034	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2035	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2036	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2037	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2038	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													

Table 4.3.10
Arctic Spill Occurrence - Sale 3 - Development Wells - Summary

Year	Production [MMbbl]	Small and Medium Spills 50-99 bbl			Large Spills 1000-9999 bbl			Huge Spills =>10000 bbl			All Spills		
		Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]
2004													
2005													
2006													
2007													
2008													
2009													
2010													
2011													
2012													
2013		0.055		0.029	0.166		2.046	0.332		44.568	0.554		46.643
2014		0.111		0.058	0.332		4.093	0.664		89.136	1.107		93.287
2015		0.111		0.058	0.332		4.093	0.664		89.136	1.107		93.287
2016													
2017													
2018													
2019	**30.8**												
2020	**38.6**												
2021	**38.6**												
2022	**38.6**												
2023	**38.6**												
2024	**38.6**												
2025	**34.0**												
2026	**29.9**												
2027	**26.3**												
2028	**23.2**												
2029	**20.4**												
2030	**17.9**												
2031	**15.8**												
2032	**13.9**												
2033	**12.2**												
2034	**10.8**												
2035	**9.5**												
2036	**8.3**												
2037	**7.3**												
2038	**6.5**												

Table 4.3.11
Arctic Spill Occurrence - Sale 3 - Wells - Summary

Year	Production [MMbbl]	Small and Medium Spills 50-999 bbl			Large Spills 1000-9999 bbl			Huge Spills =>10000 bbl			Significant Spills =>1000 bbl			All Spills		
		Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 103years	Frequency Spills per 109 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]
2004																
2005																
2006																
2007																
2008																
2009																
2010		0.158		0.082	0.476		5.862	0.751		87.639	1.227		93.501	1.386		93.583
2011																
2012		0.181		0.094	0.544		6.699	0.859		100.159	1.403		106.858	1.584		106.952
2013		0.236		0.123	0.710		8.746	1.191		144.727	1.901		153.473	2.137		153.596
2014		0.111		0.058	0.332		4.093	0.664		89.136	0.997		93.229	1.107		93.287
2015		0.314		0.163	0.944		11.630	1.631		201.815	2.575		213.445	2.889		213.608
2016																
2017		0.204		0.106	0.612		7.537	0.966		112.679	1.578		120.216	1.782		120.321
2018		0.245		0.127	0.735		9.057	1.171		137.513	1.906		146.571	2.151		146.698
2019	**30.8**	0.185	0.006	0.096	0.554	0.018	6.842	0.924	0.030	111.755	1.478	0.048	118.597	1.662	0.054	118.693
2020	**38.6**	0.390	0.010	0.203	1.170	0.030	14.445	1.950	0.051	235.926	3.119	0.081	250.371	3.509	0.091	250.574
2021	**38.6**	0.595	0.015	0.309	1.785	0.046	22.047	2.976	0.077	360.098	4.761	0.123	382.145	5.356	0.139	382.455
2022	**38.6**	0.698	0.018	0.362	2.093	0.054	25.849	3.489	0.090	422.184	5.582	0.145	448.033	6.280	0.163	448.395
2023	**38.6**	0.698	0.018	0.362	2.093	0.054	25.849	3.489	0.090	422.184	5.582	0.145	448.033	6.280	0.163	448.395
2024	**38.6**	0.698	0.018	0.362	2.093	0.054	25.849	3.489	0.090	422.184	5.582	0.145	448.033	6.280	0.163	448.395
2025	**34.0**	0.698	0.021	0.362	2.093	0.062	25.849	3.489	0.103	422.184	5.582	0.164	448.033	6.280	0.185	448.395
2026	**29.9**	0.698	0.023	0.362	2.093	0.070	25.849	3.489	0.117	422.184	5.582	0.187	448.033	6.280	0.210	448.395
2027	**26.3**	0.698	0.027	0.362	2.093	0.080	25.849	3.489	0.133	422.184	5.582	0.212	448.033	6.280	0.239	448.395
2028	**23.2**	0.698	0.030	0.362	2.093	0.090	25.849	3.489	0.150	422.184	5.582	0.241	448.033	6.280	0.271	448.395
2029	**20.4**	0.698	0.034	0.362	2.093	0.103	25.849	3.489	0.171	422.184	5.582	0.274	448.033	6.280	0.308	448.395
2030	**17.9**	0.698	0.039	0.362	2.093	0.117	25.849	3.489	0.195	422.184	5.582	0.312	448.033	6.280	0.351	448.395
2031	**15.8**	0.698	0.044	0.362	2.093	0.132	25.849	3.489	0.221	422.184	5.582	0.353	448.033	6.280	0.397	448.395
2032	**13.9**	0.698	0.050	0.362	2.093	0.151	25.849	3.489	0.251	422.184	5.582	0.402	448.033	6.280	0.452	448.395
2033	**12.2**	0.698	0.057	0.362	2.093	0.172	25.849	3.489	0.286	422.184	5.582	0.458	448.033	6.280	0.515	448.395
2034	**10.8**	0.698	0.065	0.362	2.093	0.194	25.849	3.489	0.323	422.184	5.58	0.52	448.03	6.280	0.581	448.395
2035	**9.5**	0.698	0.073	0.362	2.093	0.220	25.849	3.489	0.367	422.184	5.58	0.59	448.03	6.280	0.661	448.395
2036	**8.3**	0.698	0.084	0.362	2.093	0.252	25.849	3.489	0.420	422.184	5.58	0.67	448.03	6.280	0.757	448.395
2037	**7.3**	0.698	0.096	0.362	2.093	0.287	25.849	3.489	0.478	422.184	5.58	0.76	448.03	6.280	0.860	448.395
2038	**6.5**	0.698	0.107	0.362	2.093	0.322	25.849	3.489	0.537	422.184	5.58	0.86	448.03	6.280	0.966	448.395
Total LOF	**459.8**	**14.481**		**8**	**43.449**		**536**	**72.393**		**8759**	**115.842**		**9295**	**130.323**		**9302**
Average LOF		**0.499**	**0.031**	**0**	**1.498**	**0.094**	**18**	**2.496**	**0.157**	**302**	**3.995**	**0.252**	**321**	**4.494**	**0.283**	**321**

Table 4.3.12
Arctic Spill Occurrence - Sale 3 - Summary

Year	Facility	Production [MMbbl]	Small and Medium Spills 50-999 bbl			Large Spills 1000-9999 bbl			Huge Spills =>10000 bbl			All Spills		
			Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]
2004	Pipeline													
	Platforms													
	Production Wells													
	Exploration Wells													
	Development Wells													
	Total													
2005	Pipeline													
	Platforms													
	Production Wells													
	Exploration Wells													
	Development Wells													
	Total													
2006	Pipeline													
	Platforms													
	Production Wells													
	Exploration Wells													
	Development Wells													
	Total													
2007	Pipeline													
	Platforms													
	Production Wells													
	Exploration Wells													
	Development Wells													
	Total													
2008	Pipeline													
	Platforms													
	Production Wells													
	Exploration Wells													
	Development Wells													
	Total													
2009	Pipeline													
	Platforms													
	Production Wells													
	Exploration Wells													
	Development Wells													
	Total													
2010	Pipeline													
	Platforms													
	Production Wells													
	Exploration Wells		0.158		0.082	0.476		5.862	0.751		87.639	1.386		93.583
	Development Wells													
	Total		0.158		0.082	0.476		5.862	0.751		87.639	1.386		93.583
2011	Pipeline													
	Platforms													
	Production Wells													
	Exploration Wells													
	Development Wells													
	Total													
2012	Pipeline													
	Platforms													
	Production Wells													
	Exploration Wells		0.181		0.094	0.544		6.699	0.859		100.159	1.584		106.952
	Development Wells													
	Total		0.181		0.094	0.544		6.699	0.859		100.159	1.584		106.952
2013	Pipeline													
	Platforms													
	Production Wells													
	Exploration Wells		0.181		0.094	0.544		6.699	0.859		100.159	1.584		106.952
	Development Wells		0.055		0.029	0.166		2.046	0.332		44.568	0.554		46.643
	Total		0.236		0.123	0.710		8.746	1.191		144.727	2.137		153.596
2014	Pipeline													
	Platforms													
	Production Wells													
	Exploration Wells													
	Development Wells		0.111		0.058	0.332		4.093	0.664		89.136	1.107		93.287
	Total		0.111		0.058	0.332		4.093	0.664		89.136	1.107		93.287
2015	Pipeline													
	Platforms													
	Production Wells													
	Exploration Wells		0.204		0.106	0.612		7.537	0.966		112.679	1.782		120.321
	Development Wells		0.111		0.058	0.332		4.093	0.664		89.136	1.107		93.287
	Total		0.314		0.163	0.944		11.630	1.631		201.815	2.889		213.608
2016	Pipeline													
	Platforms													
	Production Wells													
	Exploration Wells													
	Development Wells													
	Total													
2017	Pipeline													
	Platforms													
	Production Wells													
	Exploration Wells		0.204		0.106	0.612		7.537	0.966		112.679	1.782		120.321
	Development Wells													
	Total		0.204		0.106	0.612		7.537	0.966		112.679	1.782		120.321
2018	Pipeline													
	Platforms		0.681		0.308	0.058		0.325	0.058		0.325	0.797		0.957
	Production Wells		0.041		0.021	0.123		1.521	0.205		24.834	0.369		26.376
	Exploration Wells		0.204		0.106	0.612		7.537	0.966		112.679	1.782		120.321
	Development Wells													
	Total		0.926		0.435	0.793		9.382	1.229		137.838	2.948		147.655
2019	Pipeline	30.8	4.837	0.157	1.820	3.543	0.115	18.372	1.118	0.036	17.336	9.499	0.308	37.529
	Platforms		3.067	0.100	1.386	0.260	0.008	1.461	0.260	0.008	1.461	3.586	0.116	4.308
	Production Wells		0.185	0.006	0.096	0.554	0.018	6.842	0.924	0.030	111.755	1.662	0.054	118.693
	Exploration Wells													
	Development Wells													
	Total		8.089	0.263	3.302	4.357	0.141	26.676	2.301	0.075	130.552	14.747	0.479	160.530
2020	Pipeline	38.6	4.837	0.125	1.820	3.543	0.092	18.372	1.118	0.029	17.336	9.499	0.246	37.529
	Platforms		6.474	0.168	2.926	0.548	0.014	3.085	0.548	0.014	3.085	7.570	0.196	9.096
	Production Wells		0.390	0.010	0.203	1.170	0.030	14.445	1.950	0.051	235.926	3.509	0.091	250.574
	Exploration Wells													
	Development Wells													
	Total		11.701	0.303	4.948	5.261	0.136	35.902	3.616	0.094	256.347	20.578	0.533	297.198

Table 4.3.12
Arctic Spill Occurrence - Sale 3 - Summary

Year	Facility	Production [MMbbl]	Small and Medium Spills 50-999 bbl			Large Spills 1000-9999 bbl			Huge Spills =>10000 bbl			All Spills		
			Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]
2021	Pipeline	38.6	4.837	0.125	1.820	3.543	0.092	18.372	1.118	0.029	17.336	9.499	0.246	37.529
	Platforms		9.881	0.256	4.466	0.836	0.022	4.709	0.836	0.022	4.709	11.554	0.299	13.883
	Production Wells		0.595	0.015	0.309	1.785	0.046	22.047	2.976	0.077	360.098	5.356	0.139	382.455
	Exploration Wells													
	Development Wells													
	Total		15.314	0.397	6.595	6.165	0.160	45.128	4.930	0.128	382.143	26.409	0.684	433.866
2022	Pipeline	38.6	4.837	0.125	1.820	3.543	0.092	18.372	1.118	0.029	17.336	9.499	0.246	37.529
	Platforms		11.585	0.300	5.235	0.980	0.025	5.520	0.980	0.025	5.520	13.546	0.351	16.276
	Production Wells		0.698	0.018	0.362	2.093	0.054	25.849	3.489	0.090	422.184	6.280	0.163	448.395
	Exploration Wells													
	Development Wells													
	Total		17.120	0.444	7.418	6.617	0.171	49.741	5.588	0.145	445.040	29.325	0.760	502.200
2023	Pipeline	38.6	4.837	0.125	1.820	3.543	0.092	18.372	1.118	0.029	17.336	9.499	0.246	37.529
	Platforms		11.585	0.300	5.235	0.980	0.025	5.520	0.980	0.025	5.520	13.546	0.351	16.276
	Production Wells		0.698	0.018	0.362	2.093	0.054	25.849	3.489	0.090	422.184	6.280	0.163	448.395
	Exploration Wells													
	Development Wells													
	Total		17.120	0.444	7.418	6.617	0.171	49.741	5.588	0.145	445.040	29.325	0.760	502.200
2024	Pipeline	38.6	4.837	0.125	1.820	3.543	0.092	18.372	1.118	0.029	17.336	9.499	0.246	37.529
	Platforms		11.585	0.300	5.235	0.980	0.025	5.520	0.980	0.025	5.520	13.546	0.351	16.276
	Production Wells		0.698	0.018	0.362	2.093	0.054	25.849	3.489	0.090	422.184	6.280	0.163	448.395
	Exploration Wells													
	Development Wells													
	Total		17.120	0.444	7.418	6.617	0.171	49.741	5.588	0.145	445.040	29.325	0.760	502.200
2025	Pipeline	34.0	4.837	0.142	1.820	3.543	0.104	18.372	1.118	0.033	17.336	9.499	0.279	37.529
	Platforms		11.585	0.341	5.235	0.980	0.029	5.520	0.980	0.029	5.520	13.546	0.398	16.276
	Production Wells		0.698	0.021	0.362	2.093	0.062	25.849	3.489	0.103	422.184	6.280	0.185	448.395
	Exploration Wells													
	Development Wells													
	Total		17.120	0.504	7.418	6.617	0.195	49.741	5.588	0.164	445.040	29.325	0.862	502.200
2026	Pipeline	29.9	4.837	0.162	1.820	3.543	0.119	18.372	1.118	0.037	17.336	9.499	0.318	37.529
	Platforms		11.585	0.387	5.235	0.980	0.033	5.520	0.980	0.033	5.520	13.546	0.453	16.276
	Production Wells		0.698	0.023	0.362	2.093	0.070	25.849	3.489	0.117	422.184	6.280	0.210	448.395
	Exploration Wells													
	Development Wells													
	Total		17.120	0.573	7.418	6.617	0.221	49.741	5.588	0.187	445.040	29.325	0.981	502.200
2027	Pipeline	26.3	4.837	0.184	1.820	3.543	0.135	18.372	1.118	0.043	17.336	9.499	0.361	37.529
	Platforms		11.585	0.440	5.235	0.980	0.037	5.520	0.980	0.037	5.520	13.546	0.515	16.276
	Production Wells		0.698	0.027	0.362	2.093	0.080	25.849	3.489	0.133	422.184	6.280	0.239	448.395
	Exploration Wells													
	Development Wells													
	Total		17.120	0.651	7.418	6.617	0.252	49.741	5.588	0.212	445.040	29.325	1.115	502.200
2028	Pipeline	23.2	4.837	0.209	1.820	3.543	0.153	18.372	1.118	0.048	17.336	9.499	0.409	37.529
	Platforms		11.585	0.499	5.235	0.980	0.042	5.520	0.980	0.042	5.520	13.546	0.584	16.276
	Production Wells		0.698	0.030	0.362	2.093	0.090	25.849	3.489	0.150	422.184	6.280	0.271	448.395
	Exploration Wells													
	Development Wells													
	Total		17.120	0.738	7.418	6.617	0.285	49.741	5.588	0.241	445.040	29.325	1.264	502.200
2029	Pipeline	20.4	4.837	0.237	1.820	3.543	0.174	18.372	1.118	0.055	17.336	9.499	0.466	37.529
	Platforms		11.585	0.568	5.235	0.980	0.048	5.520	0.980	0.048	5.520	13.546	0.664	16.276
	Production Wells		0.698	0.034	0.362	2.093	0.103	25.849	3.489	0.171	422.184	6.280	0.308	448.395
	Exploration Wells													
	Development Wells													
	Total		17.120	0.839	7.418	6.617	0.324	49.741	5.588	0.274	445.040	29.325	1.437	502.200
2030	Pipeline	17.9	4.837	0.270	1.820	3.543	0.198	18.372	1.118	0.062	17.336	9.499	0.531	37.529
	Platforms		11.585	0.647	5.235	0.980	0.055	5.520	0.980	0.055	5.520	13.546	0.757	16.276
	Production Wells		0.698	0.039	0.362	2.093	0.117	25.849	3.489	0.195	422.184	6.280	0.351	448.395
	Exploration Wells													
	Development Wells													
	Total		17.120	0.956	7.418	6.617	0.370	49.741	5.588	0.312	445.040	29.325	1.638	502.200
2031	Pipeline	13.9	4.837	0.306	1.555	3.543	0.224	16.672	1.118	0.071	16.090	9.499	0.601	34.316
	Platforms		11.585	0.733	5.235	0.980	0.062	5.520	0.980	0.062	5.520	13.546	0.857	16.276
	Production Wells		0.698	0.044	0.362	2.093	0.132	25.849	3.489	0.221	422.184	6.280	0.397	448.395
	Exploration Wells													
	Development Wells													
	Total		17.120	1.084	7.153	6.617	0.419	48.041	5.588	0.354	443.794	29.325	1.856	498.987
2032	Pipeline	12.2	4.837	0.348	1.820	3.543	0.255	18.372	1.118	0.080	17.336	9.499	0.683	37.529
	Platforms		11.585	0.833	5.235	0.980	0.071	5.520	0.980	0.071	5.520	13.546	0.975	16.276
	Production Wells		0.698	0.050	0.362	2.093	0.151	25.849	3.489	0.251	422.184	6.280	0.452	448.395
	Exploration Wells													
	Development Wells													
	Total		17.120	1.232	7.418	6.617	0.476	49.741	5.588	0.402	445.040	29.325	2.110	502.200
2033	Pipeline	9.5	4.837	0.397	1.820	3.543	0.290	18.372	1.118	0.092	17.336	9.499	0.779	37.529
	Platforms		11.585	0.950	5.235	0.980	0.080	5.520	0.980	0.080	5.520	13.546	1.110	16.276
	Production Wells		0.698	0.057	0.362	2.093	0.172	25.849	3.489	0.286	422.184	6.280	0.515	448.395
	Exploration Wells													
	Development Wells													
	Total		17.120	1.403	7.418	6.617	0.542	49.741	5.588	0.458	445.040	29.325	2.404	502.200
2034	Pipeline	8.3	4.837	0.448	1.820	3.543	0.328	18.372	1.118	0.104	17.336	9.499	0.880	37.529
	Platforms		11.585	1.073	5.235	0.980	0.091	5.520	0.980	0.091	5.520	13.546	1.254	16.276
	Production Wells		0.698	0.065	0.362	2.093	0.194	25.849	3.489	0.323	422.184	6.280	0.581	448.395
	Exploration Wells													
	Development Wells													
	Total		17.120	1.585	7.418	6.617	0.613	49.741	5.588	0.517	445.040	29.325	2.715	502.200
2035	Pipeline	6.5	4.837	0.509	1.820	3.543	0.373	18.372	1.118	0.118	17.336	9.499	1.000	37.529
	Platforms		11.585	1.219	5.235	0.980	0.103	5.520	0.980	0.103	5.520	13.546	1.426	16.276
	Production Wells		0.698	0.073	0.362	2.093	0.220	25.849	3.489	0.367	422.184	6.280	0.661	448.395
	Exploration Wells													
	Development Wells													
	Total		17.120	1.802	7.418	6.617	0.697	49.741	5.588	0.588	445.040	29.325	3.087	502.200
2036	Pipeline		4.837	0.583	1.820	3.543	0.427	18.372	1.118	0.135	17.336	9.499	1.144	37.529
	Platforms		11.585	1.396	5.235	0.980	0.118	5.520	0.980	0.118	5.520	13.546	1.632	16.276
	Production Wells		0.698	0.084	0.362	2.093	0.252	25.849	3.489	0.420	422.184	6.280	0.757	448.395
	Exploration Wells													
	Development Wells													
	Total		17.120	2.063	7.418	6.617	0.797	49.741	5.588	0.673	445.040	29.325	3.533	502.200
2037	Pipeline		4.837	0.663	1.820	3.543	0.485	18.372	1.118	0.153	17.336	9.499	1.301	37.529
	Platforms		11.585	1.587	5.235	0.980	0.134	5.520	0.980	0.134	5.520	13.546	1.856	16.276
	Production Wells		0.698	0.096	0.362	2.093	0.287	25.849	3.489	0.478	422.184	6.280	0.860	448.395
	Exploration Wells													
	Development Wells													
	Total		17.120	2.345	7.418	6.617	0.906	49.741	5.588	0.765	445.040	29.325	4.017	502.200
	Pipeline		4.837	0.744	1.820	3.543	0.545	18.372	1.118	0.172	17.336	9.499	1.461	37.529
	Platforms		11.585	1.782	5.235	0.980	0.151	5.520	0.980	0.151	5.520	13.546	2.084	16.276

Table 4.3.12
Arctic Spill Occurrence - Sale 3 - Summary

Year	Facility	Production [MMbbl]	Small and Medium Spills 50-999 bbl			Large Spills 1000-9999 bbl			Huge Spills =>10000 bbl			All Spills		
			Frequency Spills per 10^3 years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3 years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3 years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3 years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]
2038	Production Wells		0.698	0.107	0.362	2.093	0.322	25.849	3.489	0.537	422.184	6.280	0.966	448.395
	Exploration Wells													
	Development Wells													
	Total		17.120	2.634	7.418	6.617	1.018	49.741	5.588	0.860	445.040	29.325	4.511	502.200

Table 4.3.13
Arctic Spill Occurrence - Sale 3 - Annual Summary

Year	Production [MMbbl]	Small and Medium Spills 50-999 bbl			Large Spills 1000-9999 bbl			Huge Spills =>10000 bbl			Significant Spills =>1000 bbl			All Spills		
		Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 103years	Frequency Spills per 109 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]
2004																
2005																
2006																
2007																
2008																
2009																
2010		0.158		0.082	0.476		5.862	0.751		87.639	1.227		93.501	1.386		93.583
2011																
2012		0.181		0.094	0.544		6.699	0.859		100.159	1.403		106.858	1.584		106.952
2013		0.236		0.123	0.710		8.746	1.191		144.727	1.901		153.473	2.137		153.596
2014		0.111		0.058	0.332		4.093	0.664		89.136	0.997		93.229	1.107		93.287
2015		0.314		0.163	0.944		11.630	1.631		201.815	2.575		213.445	2.889		213.608
2016																
2017		0.204		0.106	0.612		7.537	0.966		112.679	1.578		120.216	1.782		120.321
2018		0.926		0.435	0.793		9.382	1.229		137.838	2.022		147.220	2.948		147.655
2019	**30.8**	8.089	0.263	3.302	4.357	0.141	26.676	2.301	0.075	130.552	6.658	0.216	157.228	14.747	0.479	160.530
2020	**38.6**	11.701	0.303	4.948	5.261	0.136	35.902	3.616	0.094	256.347	8.877	0.230	292.249	20.578	0.533	297.198
2021	**38.6**	15.314	0.397	6.595	6.165	0.160	45.128	4.930	0.128	382.143	11.095	0.287	427.271	26.409	0.684	433.866
2022	**38.6**	17.120	0.444	7.418	6.617	0.171	49.741	5.588	0.145	445.040	12.205	0.316	494.782	29.325	0.760	502.200
2023	**38.6**	17.120	0.444	7.418	6.617	0.171	49.741	5.588	0.145	445.040	12.205	0.316	494.782	29.325	0.760	502.200
2024	**38.6**	17.120	0.444	7.418	6.617	0.171	49.741	5.588	0.145	445.040	12.205	0.316	494.782	29.325	0.760	502.200
2025	**34.0**	17.120	0.504	7.418	6.617	0.195	49.741	5.588	0.164	445.040	12.205	0.359	494.782	29.325	0.862	502.200
2026	**29.9**	17.120	0.573	7.418	6.617	0.221	49.741	5.588	0.187	445.040	12.205	0.408	494.782	29.325	0.981	502.200
2027	**26.3**	17.120	0.651	7.418	6.617	0.252	49.741	5.588	0.212	445.040	12.205	0.464	494.782	29.325	1.115	502.200
2028	**23.2**	17.120	0.738	7.418	6.617	0.285	49.741	5.588	0.241	445.040	12.205	0.526	494.782	29.325	1.264	502.200
2029	**20.4**	17.120	0.839	7.418	6.617	0.324	49.741	5.588	0.274	445.040	12.205	0.598	494.782	29.325	1.437	502.200
2030	**17.9**	17.120	0.956	7.418	6.617	0.370	49.741	5.588	0.312	445.040	12.205	0.682	494.782	29.325	1.638	502.200
2031	**15.8**	17.120	1.084	7.153	6.617	0.419	48.041	5.588	0.354	443.794	12.205	0.772	491.835	29.325	1.856	498.987
2032	**13.9**	17.120	1.232	7.418	6.617	0.476	49.741	5.588	0.402	445.040	12.205	0.878	494.782	29.325	2.110	502.200
2033	**12.2**	17.120	1.403	7.418	6.617	0.542	49.741	5.588	0.458	445.040	12.205	1.000	494.782	29.325	2.404	502.200
2034	**10.8**	17.120	1.585	7.418	6.617	0.613	49.741	5.588	0.517	445.04	12.20	1.13	494.78	29.325	2.715	502.200
2035	**9.5**	17.120	1.802	7.418	6.617	0.697	49.741	5.588	0.588	445.04	12.20	1.28	494.78	29.325	3.087	502.200
2036	**8.3**	17.120	2.063	7.418	6.617	0.797	49.741	5.588	0.673	445.04	12.20	1.47	494.78	29.325	3.533	502.200
2037	**7.3**	17.120	2.345	7.418	6.617	0.906	49.741	5.588	0.765	445.04	12.20	1.67	494.78	29.325	4.017	502.200
2038	**6.5**	17.120	2.634	7.418	6.617	1.018	49.741	5.588	0.860	445.04	12.20	1.88	494.78	29.325	4.511	502.200
Total LOF	**459.8**	**328.275**		**142**	**132.682**		**1006**	**113.128**		**9207**	**245.810**		**10213**	**574.085**		**10355**
Average LOF		**11.320**	**0.714**	**5**	**4.575**	**0.289**	**35**	**3.901**	**0.246**	**317**	**8.476**	**0.535**	**352**	**19.796**	**1.249**	**357**

Table 4.3.14
Sale 3 - Year 2024 - Monte Carlo Results

Sale 3 Year 2024	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills
	Frequency Spills per 10^3years					Frequency Spills per 10^9 bbl Produced					Spill Index [bbl]				
Mean =	17.15	6.62	5.59	12.20	29.35	0.44	0.17	0.14	0.32	0.76	7.46	49.75	444.95	494.70	502.16
Std Deviation =	6.95	1.91	1.29	2.73	7.46	0.18	0.05	0.03	0.07	0.19	5.21	22.17	168.88	170.40	170.40
Variance =	48.331	3.663	1.671	7.479	55.687	0.032	0.002	0.001	0.005	0.037	27.176	491.361	28520.880	29036.500	29037.550
Skewness =	0.68	0.42	0.13	0.19	0.56	0.68	0.42	0.13	0.19	0.56	1.56	0.70	0.55	0.54	0.54
Kurtosis =	2.93	2.92	2.87	2.86	2.96	2.93	2.92	2.87	2.86	2.96	5.92	3.42	3.32	3.34	3.34
Mode =	11.30	5.97	4.86	11.46	20.46	0.29	0.15	0.14	0.30	0.53	3.51	44.63	389.78	639.06	430.80
Minimum =	4.514	1.446	1.768	3.922	11.711	0.117	0.037	0.046	0.102	0.303	-0.173	1.702	50.934	67.289	69.579
5% Perc =	7.863	3.765	3.492	7.786	18.981	0.204	0.098	0.090	0.202	0.492	1.905	18.686	193.221	243.635	250.665
10% Perc =	9.088	4.289	3.929	8.780	20.432	0.235	0.111	0.102	0.227	0.529	2.445	23.737	238.928	288.369	296.606
15% Perc =	10.069	4.671	4.244	9.369	21.585	0.261	0.121	0.110	0.243	0.559	2.932	27.163	273.248	321.060	327.734
20% Perc =	10.837	4.969	4.478	9.843	22.760	0.281	0.129	0.116	0.255	0.590	3.385	30.511	301.653	347.931	354.937
25% Perc =	11.668	5.221	4.688	10.259	23.749	0.302	0.135	0.121	0.266	0.615	3.769	33.324	323.544	372.319	379.292
30% Perc =	12.497	5.492	4.883	10.676	24.635	0.324	0.142	0.126	0.277	0.638	4.183	36.107	346.435	394.373	402.362
35% Perc =	13.284	5.740	5.065	11.019	25.504	0.344	0.149	0.131	0.285	0.661	4.634	38.576	365.947	415.980	423.407
40% Perc =	14.182	5.958	5.233	11.415	26.549	0.367	0.154	0.136	0.296	0.688	5.027	41.467	386.932	436.865	443.840
45% Perc =	15.085	6.186	5.410	11.773	27.389	0.391	0.160	0.140	0.305	0.710	5.465	44.405	407.158	456.638	463.962
50% Perc =	15.971	6.410	5.577	12.117	28.424	0.414	0.166	0.144	0.314	0.736	5.941	47.115	428.121	477.697	485.850
55% Perc =	16.980	6.664	5.729	12.452	29.389	0.440	0.173	0.148	0.323	0.761	6.533	49.993	449.208	501.359	509.704
60% Perc =	17.922	6.924	5.884	12.814	30.451	0.464	0.179	0.152	0.332	0.789	7.144	52.718	473.266	524.312	532.597
65% Perc =	19.033	7.209	6.050	13.199	31.531	0.493	0.187	0.157	0.342	0.817	7.886	55.897	496.962	548.284	555.859
70% Perc =	20.218	7.517	6.220	13.585	32.875	0.524	0.195	0.161	0.352	0.852	8.736	59.368	520.885	571.497	579.635
75% Perc =	21.426	7.854	6.420	14.008	34.126	0.555	0.203	0.166	0.363	0.884	9.663	62.799	548.987	598.756	607.913
80% Perc =	23.040	8.237	6.678	14.501	35.532	0.597	0.213	0.173	0.376	0.921	10.892	67.172	582.145	631.668	638.155
85% Perc =	24.870	8.692	6.930	15.078	37.405	0.644	0.225	0.180	0.391	0.969	12.482	72.320	619.543	668.454	675.712
90% Perc =	27.351	9.305	7.283	15.804	39.897	0.709	0.241	0.189	0.409	1.034	14.629	79.633	670.671	723.316	730.384
95% Perc =	30.405	10.062	7.793	16.906	43.009	0.788	0.261	0.202	0.438	1.114	18.152	91.198	748.713	801.612	807.301
Maximum =	42.173	14.210	10.229	21.953	56.008	1.093	0.368	0.265	0.569	1.451	37.282	141.618	1164.348	1216.713	1226.178

Table 4.3.15
Sale 3 LOF Average - Pipeline - Monte Carlo Results

Sale 3 Pipeline	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills
All years Average LOF	**Frequency Spills per 10^3years**					**Frequency Spills per 10^9 bbl Produced**					**Spill Index [bbl]**				
Mean =	3.34	2.45	0.77	3.22	6.55	0.21	0.15	0.05	0.20	0.41	1.25	12.62	11.95	24.56	25.81
Std Deviation =	1.16	1.10	0.37	1.15	1.65	0.07	0.07	0.02	0.07	0.10	0.82	8.82	6.19	10.78	10.82
Variance =	1.343	1.210	0.135	1.333	2.739	0.005	0.005	0.001	0.005	0.011	0.681	77.878	38.356	116.315	117.138
Skewness =	0.47	0.63	0.69	0.55	0.38	0.47	0.63	0.69	0.55	0.38	1.32	1.35	0.87	0.89	0.88
Kurtosis =	2.74	2.84	2.90	2.83	2.88	2.74	2.84	2.90	2.83	2.88	5.05	5.19	3.46	3.89	3.86
Mode =	3.18	1.82	1.55	2.60	5.63	0.20	0.11	0.10	0.17	0.40	0.65	7.47	5.71	16.79	30.39
Minimum =	0.753	0.386	0.099	0.804	2.557	0.048	0.024	0.006	0.051	0.161	-0.124	-1.500	1.169	2.638	3.815
5% Perc =	1.646	0.985	0.291	1.615	4.104	0.104	0.062	0.018	0.102	0.259	0.311	2.556	4.136	10.085	11.325
10% Perc =	1.918	1.152	0.351	1.830	4.509	0.121	0.073	0.022	0.115	0.284	0.406	3.688	5.076	12.273	13.501
15% Perc =	2.129	1.301	0.397	2.000	4.829	0.134	0.082	0.025	0.126	0.305	0.494	4.521	5.759	13.956	15.189
20% Perc =	2.294	1.445	0.442	2.164	5.076	0.145	0.091	0.028	0.136	0.320	0.574	5.301	6.442	15.394	16.619
25% Perc =	2.451	1.577	0.481	2.324	5.316	0.155	0.099	0.030	0.147	0.335	0.648	6.140	7.088	16.688	17.863
30% Perc =	2.601	1.706	0.524	2.462	5.559	0.164	0.108	0.033	0.155	0.350	0.708	6.957	7.762	17.885	19.082
35% Perc =	2.752	1.832	0.565	2.614	5.779	0.174	0.116	0.036	0.165	0.364	0.781	7.685	8.481	19.061	20.327
40% Perc =	2.900	1.973	0.610	2.771	6.001	0.183	0.124	0.038	0.175	0.378	0.858	8.558	9.184	20.284	21.487
45% Perc =	3.045	2.115	0.657	2.918	6.221	0.192	0.133	0.041	0.184	0.392	0.941	9.461	9.899	21.580	22.766
50% Perc =	3.190	2.269	0.702	3.068	6.421	0.201	0.143	0.044	0.194	0.405	1.027	10.614	10.676	22.892	24.233
55% Perc =	3.350	2.427	0.758	3.222	6.654	0.211	0.153	0.048	0.203	0.420	1.127	11.616	11.493	24.273	25.536
60% Perc =	3.527	2.586	0.814	3.397	6.877	0.222	0.163	0.051	0.214	0.434	1.244	12.652	12.454	25.504	26.868
65% Perc =	3.704	2.756	0.874	3.592	7.113	0.234	0.174	0.055	0.227	0.449	1.367	13.929	13.408	26.932	28.244
70% Perc =	3.925	2.958	0.947	3.770	7.375	0.248	0.187	0.060	0.238	0.465	1.502	15.290	14.451	28.572	29.905
75% Perc =	4.119	3.181	1.016	3.974	7.651	0.260	0.201	0.064	0.251	0.483	1.660	16.802	15.825	30.628	31.868
80% Perc =	4.336	3.418	1.091	4.226	7.950	0.273	0.216	0.069	0.267	0.501	1.844	18.553	17.239	32.826	33.997
85% Perc =	4.621	3.694	1.191	4.513	8.311	0.291	0.233	0.075	0.285	0.524	2.062	21.055	18.736	35.694	37.027
90% Perc =	4.969	4.034	1.303	4.824	8.812	0.313	0.254	0.082	0.304	0.556	2.356	24.634	20.692	39.409	40.748
95% Perc =	5.420	4.507	1.464	5.337	9.492	0.342	0.284	0.092	0.337	0.599	2.922	30.332	23.646	45.157	46.562
Maximum =	7.573	6.484	2.082	7.272	13.512	0.478	0.409	0.131	0.459	0.852	5.918	62.559	40.588	76.588	77.120

Table 4.3.16
Sale 3 LOF Average - Platforms - Monte Carlo Results

Sale 3 Platforms	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills
All years Average LOF	**Frequency Spills per 10^3years**					**Frequency Spills per 10^9 bbl Produced**					**Spill Index [bbl]**				
Mean =	7.49	0.63	0.63	1.27	8.75	0.47	0.04	0.04	0.08	0.55	3.38	3.56	3.56	7.12	10.50
Std Deviation =	4.27	0.38	0.38	0.75	4.34	0.27	0.02	0.02	0.05	0.27	3.21	2.88	2.88	5.75	6.58
Variance =	18.238	0.141	0.141	0.563	18.795	0.073	0.001	0.001	0.002	0.075	10.324	8.278	8.278	33.110	43.316
Skewness =	0.73	0.73	0.73	0.73	0.71	0.73	0.73	0.73	0.73	0.71	1.82	1.32	1.32	1.32	1.05
Kurtosis =	2.97	2.93	2.93	2.93	2.99	2.97	2.93	2.93	2.93	2.99	7.27	4.97	4.97	4.97	4.17
Mode =	9.06	0.28	0.28	0.55	7.94	0.57	0.02	0.02	0.03	0.50	1.05	2.86	2.86	5.72	5.37
Minimum =	0.572	0.033	0.033	0.065	0.871	0.036	0.002	0.002	0.004	0.055	-0.876	-1.443	-1.443	-2.885	-1.427
5% Perc =	1.988	0.152	0.152	0.304	3.026	0.125	0.010	0.010	0.019	0.191	0.230	0.373	0.373	0.745	2.394
10% Perc =	2.599	0.207	0.207	0.415	3.733	0.164	0.013	0.013	0.026	0.235	0.451	0.678	0.678	1.355	3.262
15% Perc =	3.093	0.250	0.250	0.501	4.341	0.195	0.016	0.016	0.032	0.274	0.662	0.923	0.923	1.847	4.144
20% Perc =	3.607	0.288	0.288	0.575	4.819	0.228	0.018	0.018	0.036	0.304	0.891	1.160	1.160	2.320	4.893
25% Perc =	4.000	0.326	0.326	0.653	5.347	0.252	0.021	0.021	0.041	0.337	1.106	1.390	1.390	2.780	5.555
30% Perc =	4.456	0.369	0.369	0.739	5.820	0.281	0.023	0.023	0.047	0.367	1.349	1.646	1.646	3.292	6.247
35% Perc =	5.004	0.412	0.412	0.823	6.330	0.316	0.026	0.026	0.052	0.399	1.566	1.894	1.894	3.788	6.964
40% Perc =	5.584	0.460	0.460	0.919	6.868	0.352	0.029	0.029	0.058	0.433	1.854	2.179	2.179	4.359	7.624
45% Perc =	6.131	0.508	0.508	1.016	7.425	0.387	0.032	0.032	0.064	0.468	2.154	2.502	2.502	5.005	8.339
50% Perc =	6.751	0.559	0.559	1.118	7.981	0.426	0.035	0.035	0.071	0.503	2.435	2.824	2.824	5.648	9.137
55% Perc =	7.328	0.618	0.618	1.237	8.574	0.462	0.039	0.039	0.078	0.541	2.791	3.151	3.151	6.302	9.939
60% Perc =	7.956	0.676	0.676	1.352	9.202	0.502	0.043	0.043	0.085	0.580	3.138	3.532	3.532	7.064	10.824
65% Perc =	8.645	0.740	0.740	1.481	9.949	0.545	0.047	0.047	0.093	0.627	3.516	3.919	3.919	7.837	11.765
70% Perc =	9.448	0.806	0.806	1.612	10.696	0.596	0.051	0.051	0.102	0.675	4.019	4.458	4.458	8.916	12.860
75% Perc =	10.216	0.882	0.882	1.763	11.614	0.644	0.056	0.056	0.111	0.733	4.567	4.998	4.998	9.997	14.161
80% Perc =	11.222	0.960	0.960	1.921	12.438	0.708	0.061	0.061	0.121	0.784	5.376	5.629	5.629	11.258	15.511
85% Perc =	12.241	1.058	1.058	2.117	13.600	0.772	0.067	0.067	0.134	0.858	6.272	6.477	6.477	12.954	17.283
90% Perc =	13.585	1.168	1.168	2.335	14.956	0.857	0.074	0.074	0.147	0.943	7.545	7.619	7.619	15.238	19.721
95% Perc =	15.713	1.337	1.337	2.675	17.020	0.991	0.084	0.084	0.169	1.073	9.888	9.320	9.320	18.639	23.384
Maximum =	26.100	2.141	2.141	4.282	26.617	1.646	0.135	0.135	0.270	1.679	23.197	20.434	20.434	40.868	43.266

Table 4.3.17
Sale 3 LOF Average - Wells - Monte Carlo Results

Sale 3 Wells	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills
All years Average LOF	**Frequency Spills per 10^3years**					**Frequency Spills per 10^9 bbl Produced**					**Spill Index [bbl]**				
Mean =	0.50	1.50	2.50	3.99	4.49	0.03	0.09	0.16	0.25	0.28	0.26	18.48	301.94	320.42	320.68
Std Deviation =	0.18	0.55	0.66	1.16	1.18	0.01	0.03	0.04	0.07	0.07	0.18	12.15	110.86	111.51	111.51
Variance =	0.034	0.306	0.438	1.351	1.383	0.000	0.001	0.002	0.005	0.006	0.032	147.521	########	########	########
Skewness =	-0.02	-0.01	-0.03	-0.03	-0.01	-0.02	-0.01	-0.03	-0.03	-0.01	0.79	0.85	0.41	0.40	0.40
Kurtosis =	2.42	2.41	2.69	2.53	2.57	2.42	2.41	2.69	2.53	2.57	3.49	3.54	3.08	3.09	3.09
Mode =	0.52	1.44	2.10	4.20	5.13	0.03	0.09	0.13	0.30	0.30	0.29	8.87	419.24	153.40	315.13
Minimum =	0.034	0.095	0.346	0.511	0.938	0.002	0.006	0.022	0.032	0.059	-0.104	-3.825	32.932	50.900	51.114
5% Perc =	0.193	0.567	1.396	2.063	2.533	0.012	0.036	0.088	0.130	0.160	0.019	2.693	134.343	150.925	151.044
10% Perc =	0.251	0.747	1.622	2.438	2.945	0.016	0.047	0.102	0.154	0.186	0.053	4.571	164.872	181.998	182.288
15% Perc =	0.294	0.889	1.802	2.741	3.213	0.019	0.056	0.114	0.173	0.203	0.078	6.291	186.820	204.874	204.981
20% Perc =	0.334	0.999	1.919	2.965	3.453	0.021	0.063	0.121	0.187	0.218	0.105	7.695	206.109	223.608	223.808
25% Perc =	0.366	1.100	2.039	3.180	3.665	0.023	0.069	0.129	0.201	0.231	0.126	9.295	222.241	239.745	240.042
30% Perc =	0.398	1.192	2.137	3.354	3.847	0.025	0.075	0.135	0.212	0.243	0.145	10.640	237.108	255.391	255.744
35% Perc =	0.426	1.286	2.228	3.517	4.023	0.027	0.081	0.141	0.222	0.254	0.166	12.001	252.813	271.018	271.107
40% Perc =	0.452	1.355	2.319	3.679	4.176	0.029	0.085	0.146	0.232	0.263	0.188	13.571	266.991	286.873	287.420
45% Perc =	0.478	1.427	2.407	3.857	4.347	0.030	0.090	0.152	0.243	0.274	0.208	14.919	281.099	299.051	299.230
50% Perc =	0.500	1.501	2.499	4.002	4.513	0.032	0.095	0.158	0.252	0.285	0.231	16.356	294.367	312.739	313.106
55% Perc =	0.523	1.573	2.589	4.161	4.655	0.033	0.099	0.163	0.262	0.294	0.251	17.950	306.758	326.225	326.601
60% Perc =	0.549	1.647	2.684	4.317	4.807	0.035	0.104	0.169	0.272	0.303	0.277	19.523	321.573	340.472	340.883
65% Perc =	0.572	1.718	2.770	4.476	4.962	0.036	0.108	0.175	0.282	0.313	0.305	21.306	337.413	356.055	356.262
70% Perc =	0.601	1.800	2.866	4.633	5.154	0.038	0.114	0.181	0.292	0.325	0.336	23.333	354.586	372.705	372.934
75% Perc =	0.632	1.890	2.970	4.821	5.333	0.040	0.119	0.187	0.304	0.336	0.365	25.474	373.074	393.549	393.869
80% Perc =	0.666	2.000	3.074	5.029	5.536	0.042	0.126	0.194	0.317	0.349	0.401	28.255	393.550	412.867	412.946
85% Perc =	0.705	2.106	3.203	5.261	5.759	0.044	0.133	0.202	0.332	0.363	0.441	31.615	418.337	437.308	437.533
90% Perc =	0.746	2.250	3.357	5.538	6.039	0.047	0.142	0.212	0.349	0.381	0.503	35.454	448.826	467.472	467.820
95% Perc =	0.805	2.418	3.568	5.890	6.413	0.051	0.152	0.225	0.371	0.404	0.601	41.904	497.630	517.591	518.248
Maximum =	0.970	2.838	4.461	7.190	7.878	0.061	0.179	0.281	0.453	0.497	1.022	72.491	759.610	777.649	777.744

Table 4.3.18
Sale 3 LOF Average Platforms + Wells - Monte Carlo Results

Sale 3 Platforms + Wells	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills
All years Average LOF	**Frequency Spills per 10^3years**					**Frequency Spills per 10^9 bbl Produced**					**Spill Index [bbl]**				
Mean =	7.99	2.13	3.13	5.26	13.25	0.50	0.13	0.20	0.33	0.84	3.64	22.04	305.50	327.54	331.18
Std Deviation =	4.28	0.68	0.77	1.40	4.52	0.27	0.04	0.05	0.09	0.29	3.22	12.53	110.92	111.71	111.72
Variance =	18.325	0.460	0.593	1.971	20.434	0.073	0.002	0.002	0.008	0.081	10.360	157.033	########	########	########
Skewness =	0.73	0.13	0.06	0.10	0.64	0.73	0.13	0.06	0.10	0.64	1.82	0.79	0.41	0.40	0.40
Kurtosis =	2.98	2.69	2.80	2.73	2.98	2.98	2.69	2.80	2.73	2.98	7.27	3.47	3.08	3.08	3.08
Mode =	8.04	2.62	3.29	8.56	11.51	0.27	0.17	0.25	0.54	0.73	0.64	19.67	293.73	403.59	305.61
Minimum =	0.692	0.379	0.699	1.149	3.299	0.044	0.024	0.044	0.072	0.208	-0.827	-2.156	34.155	52.622	53.361
5% Perc =	2.471	1.013	1.876	2.958	7.074	0.156	0.064	0.118	0.187	0.446	0.461	5.374	138.048	157.130	161.263
10% Perc =	3.111	1.253	2.133	3.459	7.958	0.196	0.079	0.135	0.218	0.502	0.707	7.543	168.756	190.780	193.862
15% Perc =	3.578	1.416	2.325	3.779	8.634	0.226	0.089	0.147	0.238	0.545	0.925	9.326	189.307	211.718	215.254
20% Perc =	4.067	1.540	2.465	4.036	9.239	0.257	0.097	0.155	0.255	0.583	1.145	10.911	209.272	230.970	235.196
25% Perc =	4.496	1.646	2.599	4.276	9.796	0.284	0.104	0.164	0.270	0.618	1.366	12.416	226.008	246.149	250.206
30% Perc =	4.981	1.751	2.713	4.483	10.296	0.314	0.110	0.171	0.283	0.649	1.593	14.043	240.503	262.572	265.657
35% Perc =	5.505	1.858	2.812	4.684	10.847	0.347	0.117	0.177	0.295	0.684	1.854	15.484	255.921	277.692	281.383
40% Perc =	6.075	1.941	2.913	4.870	11.386	0.383	0.122	0.184	0.307	0.718	2.141	17.055	270.649	293.767	296.995
45% Perc =	6.664	2.034	3.019	5.052	11.909	0.420	0.128	0.190	0.319	0.751	2.417	18.634	284.504	305.930	308.948
50% Perc =	7.245	2.115	3.120	5.230	12.526	0.457	0.133	0.197	0.330	0.790	2.694	20.047	297.758	319.736	323.232
55% Perc =	7.861	2.198	3.217	5.413	13.136	0.496	0.139	0.203	0.341	0.828	3.047	21.635	311.007	332.904	336.610
60% Perc =	8.464	2.294	3.323	5.598	13.785	0.534	0.145	0.210	0.353	0.869	3.386	23.392	325.237	348.604	352.991
65% Perc =	9.149	2.385	3.424	5.795	14.501	0.577	0.150	0.216	0.365	0.915	3.773	25.226	341.184	363.359	367.261
70% Perc =	9.919	2.493	3.534	5.999	15.321	0.626	0.157	0.223	0.378	0.966	4.282	27.225	357.988	380.231	384.101
75% Perc =	10.692	2.599	3.653	6.217	16.186	0.674	0.164	0.230	0.392	1.021	4.864	29.499	377.476	400.328	403.947
80% Perc =	11.740	2.716	3.801	6.474	17.265	0.740	0.171	0.240	0.408	1.089	5.624	32.178	397.441	419.404	423.360
85% Perc =	12.724	2.850	3.937	6.761	18.233	0.803	0.180	0.248	0.426	1.150	6.579	35.503	422.217	445.012	448.444
90% Perc =	14.144	3.031	4.148	7.120	19.571	0.892	0.191	0.262	0.449	1.234	7.840	39.143	452.489	475.638	479.177
95% Perc =	16.239	3.286	4.415	7.605	21.758	1.024	0.207	0.278	0.480	1.372	10.123	45.893	501.942	524.884	528.807
Maximum =	26.823	4.316	5.681	9.896	33.037	1.692	0.272	0.358	0.624	2.084	23.492	80.145	760.715	780.162	784.357

Table 4.3.19
Sale 3 LOF Average - Monte Carlo Results

Sale 3	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills
All years Average LOF	**Frequency Spills per 10^3years**					**Frequency Spills per 10^9 bbl Produced**					**Spill Index [bbl]**				
Mean =	11.32	4.58	3.90	8.48	19.80	0.71	0.29	0.25	0.53	1.25	4.88	34.66	317.44	352.10	356.99
Std Deviation =	4.43	1.30	0.86	1.83	4.81	0.28	0.08	0.05	0.12	0.30	3.30	15.50	111.25	112.54	112.55
Variance =	19.616	1.684	0.734	3.342	23.092	0.078	0.007	0.003	0.013	0.092	10.903	240.285	########	########	########
Skewness =	0.66	0.42	0.11	0.20	0.55	0.66	0.42	0.11	0.20	0.55	1.67	0.67	0.41	0.39	0.40
Kurtosis =	2.95	2.86	2.99	2.85	2.99	2.95	2.86	2.99	2.85	2.99	6.74	3.20	3.10	3.08	3.08
Mode =	7.40	4.74	3.60	8.44	17.09	0.47	0.30	0.28	0.53	1.79	5.07	28.78	291.57	321.44	512.90
Minimum =	2.740	1.067	1.154	2.671	8.377	0.173	0.067	0.073	0.168	0.528	-0.191	2.158	43.453	77.253	81.760
5% Perc =	5.375	2.684	2.516	5.570	12.955	0.339	0.169	0.159	0.351	0.817	1.295	12.895	150.277	179.876	184.566
10% Perc =	6.227	3.013	2.802	6.198	14.121	0.393	0.190	0.177	0.391	0.891	1.714	16.393	180.363	212.903	217.313
15% Perc =	6.785	3.227	2.992	6.598	14.890	0.428	0.204	0.189	0.416	0.939	2.015	18.938	202.157	235.644	240.914
20% Perc =	7.351	3.423	3.171	6.905	15.566	0.464	0.216	0.200	0.435	0.982	2.304	20.965	221.251	254.864	260.046
25% Perc =	7.845	3.620	3.321	7.190	16.229	0.495	0.228	0.209	0.453	1.024	2.575	22.898	237.656	270.048	275.317
30% Perc =	8.377	3.793	3.461	7.436	16.797	0.528	0.239	0.218	0.469	1.059	2.870	25.017	252.190	286.673	291.221
35% Perc =	8.854	3.947	3.577	7.681	17.380	0.558	0.249	0.226	0.484	1.096	3.148	26.856	268.346	302.565	307.242
40% Perc =	9.445	4.122	3.676	7.924	17.986	0.596	0.260	0.232	0.500	1.134	3.444	28.932	283.237	316.693	321.265
45% Perc =	10.046	4.283	3.785	8.162	18.527	0.634	0.270	0.239	0.515	1.168	3.723	30.721	296.959	331.331	335.205
50% Perc =	10.622	4.444	3.890	8.425	19.128	0.670	0.280	0.245	0.531	1.206	4.022	32.518	309.222	344.176	349.074
55% Perc =	11.189	4.625	4.005	8.674	19.822	0.706	0.292	0.253	0.547	1.250	4.346	34.531	322.938	359.096	363.736
60% Perc =	11.883	4.797	4.107	8.891	20.466	0.749	0.303	0.259	0.561	1.291	4.711	36.556	337.168	373.475	378.411
65% Perc =	12.573	5.006	4.216	9.112	21.227	0.793	0.316	0.266	0.575	1.339	5.120	38.791	352.948	387.988	393.094
70% Perc =	13.359	5.205	4.328	9.382	22.043	0.843	0.328	0.273	0.592	1.390	5.654	41.221	370.598	405.017	410.811
75% Perc =	14.129	5.437	4.469	9.691	22.933	0.891	0.343	0.282	0.611	1.446	6.249	44.174	388.823	425.280	430.373
80% Perc =	15.115	5.677	4.611	10.029	23.861	0.953	0.358	0.291	0.633	1.505	6.995	47.385	408.847	445.088	450.027
85% Perc =	16.294	5.969	4.794	10.411	25.041	1.028	0.376	0.302	0.657	1.579	7.814	51.009	433.727	469.191	473.557
90% Perc =	17.683	6.366	5.016	10.931	26.410	1.115	0.402	0.316	0.689	1.666	9.258	56.047	464.465	501.587	507.398
95% Perc =	19.533	6.889	5.329	11.587	28.668	1.232	0.435	0.336	0.731	1.808	11.480	63.435	515.020	550.822	556.201
Maximum =	29.600	9.595	7.340	15.255	40.129	1.867	0.605	0.463	0.962	2.531	24.141	98.205	789.123	826.115	827.992

Table 4.3.20
Composition of Spill Indicators - Sale 3 - Year 2024

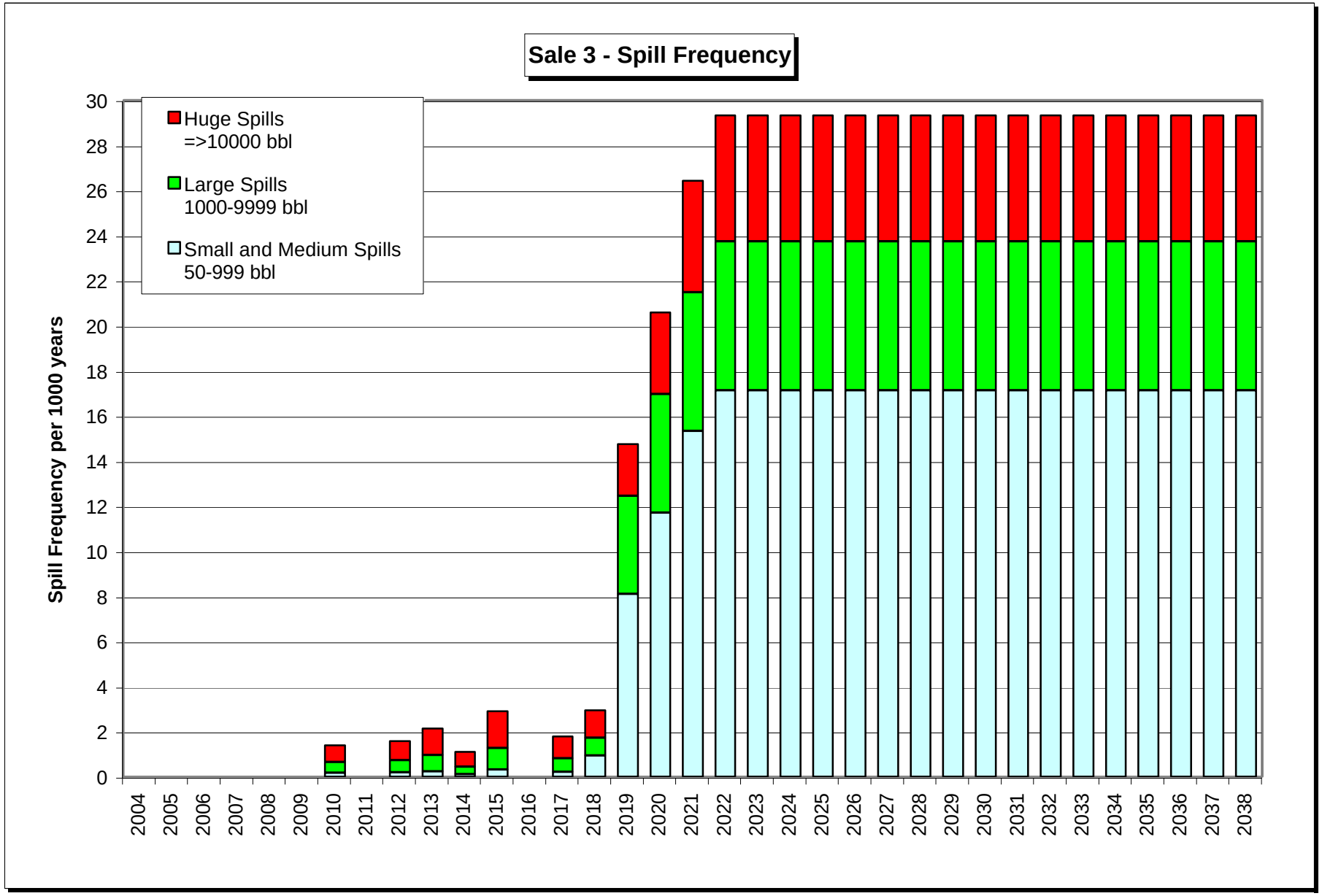
Spill Size	Spill Source									
	P/L		Platforms		Wells		Platforms and Wells		All	
	Sale 3 - Year 2024 Spill Frequency per 10^3 years									
Small and Medium Spills 50-999 bbl	4.837	51%	11.585	86%	0.698	11%	12.283	62%	17.120	58%
Large Spills 1000-9999 bbl	3.543	37%	0.980	7%	2.093	33%	3.074	16%	6.617	23%
Huge Spills =>10000 bbl	1.118	12%	0.980	7%	3.489	56%	4.469	23%	5.588	19%
Significant Spills =>1000 bbl	4.662	49%	1.961	14%	5.582	89%	7.543	38%	12.205	42%
All Spills	**9.499**	**100%**	**13.546**	**100%**	**6.280**	**100%**	**19.826**	**100%**	**29.325**	**100%**
	Sale 3 - LYear 2024 Spill Frequency per 10^9 bbl produced									
Small and Medium Spills 50-999 bbl	0.125	51%	0.300	86%	0.018	11%	0.318	62%	0.444	58%
Large Spills 1000-9999 bbl	0.092	37%	0.025	7%	0.054	33%	0.080	16%	0.171	23%
Huge Spills =>10000 bbl	0.029	12%	0.025	7%	0.090	56%	0.116	23%	0.145	19%
Significant Spills =>1000 bbl	0.121	49%	0.051	14%	0.145	89%	0.195	38%	0.316	42%
All Spills	**0.246**	**100%**	**0.351**	**100%**	**0.163**	**100%**	**0.514**	**100%**	**0.760**	**100%**
	Sale 3 - Year 2024 Spill Index [bbl]									
Small and Medium Spills 50-999 bbl	2	5%	5	32%	0	0%	6	1%	7	1%
Large Spills 1000-9999 bbl	18	49%	6	34%	26	6%	31	7%	50	10%
Huge Spills =>10000 bbl	17	46%	6	34%	422	94%	428	92%	445	89%
Significant Spills =>1000 bbl	36	95%	11	68%	448	100%	459	99%	495	99%
All Spills	**38**	**100%**	**16**	**100%**	**448**	**100%**	**465**	**100%**	**502**	**100%**

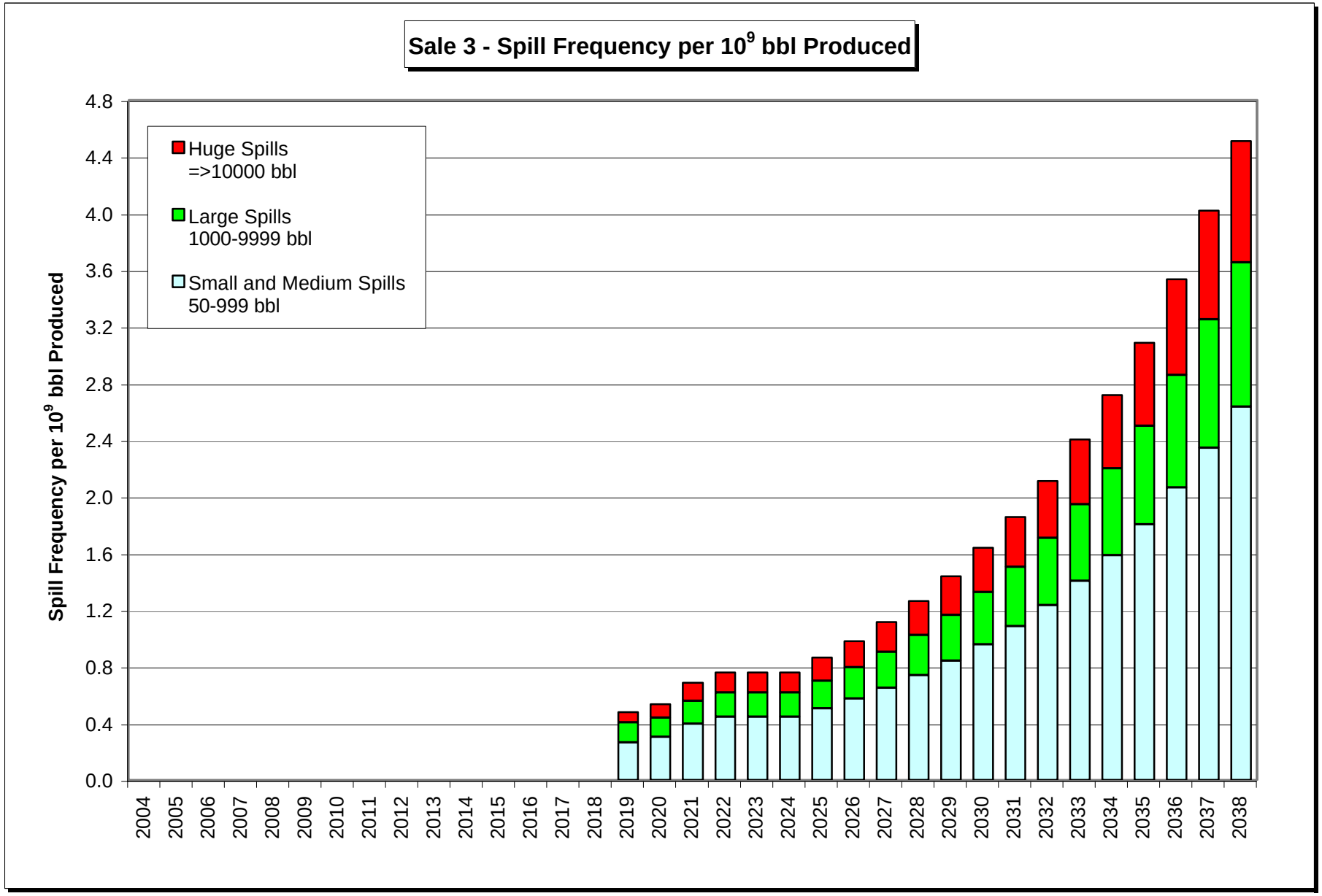
Spill Source	Spill Size									
	S+M 50-999 bbl		Large 1000-9999 bbl		Huge =>10000 bbl		Significant =>1000 bbl		All Spills	
	Sale 3 - Year 2024 Spill Frequency per 10^3 years									
P/L	4.837	28%	3.543	54%	1.118	20%	4.662	38%	9.499	32%
Platforms	11.585	68%	0.980	15%	0.980	18%	1.961	16%	13.546	46%
Wells	0.698	4%	2.093	32%	3.489	62%	5.582	46%	6.280	21%
Platforms and Wells	12.283	72%	3.074	46%	4.469	80%	7.543	62%	19.826	68%
All	**17.120**	**100%**	**6.617**	**100%**	**5.588**	**100%**	**12.205**	**100%**	**29.325**	**100%**
	Sale 3 - Year 2024 Spill Frequency per 10^9 bbl produced									
P/L	0.125	28%	0.092	54%	0.029	20%	0.121	38%	0.246	32%
Platforms	0.300	68%	0.025	15%	0.025	18%	0.051	16%	0.351	46%
Wells	0.018	4%	0.054	32%	0.090	62%	0.145	46%	0.163	21%
Platforms and Wells	0.318	72%	0.080	46%	0.116	80%	0.195	62%	0.514	68%
All	**0.444**	**100%**	**0.171**	**100%**	**0.145**	**100%**	**0.316**	**100%**	**0.760**	**100%**
	Sale 3 - Year 2024 Spill Index [bbl]									
P/L	2	25%	18	37%	17	4%	36	7%	38	7%
Platforms	5	71%	6	11%	6	1%	11	2%	16	3%
Wells	0	5%	26	52%	422	95%	448	91%	448	89%
Platforms and Wells	6	75%	31	63%	428	96%	459	93%	465	93%
All	**7**	**100%**	**50**	**100%**	**445**	**100%**	**495**	**100%**	**502**	**100%**

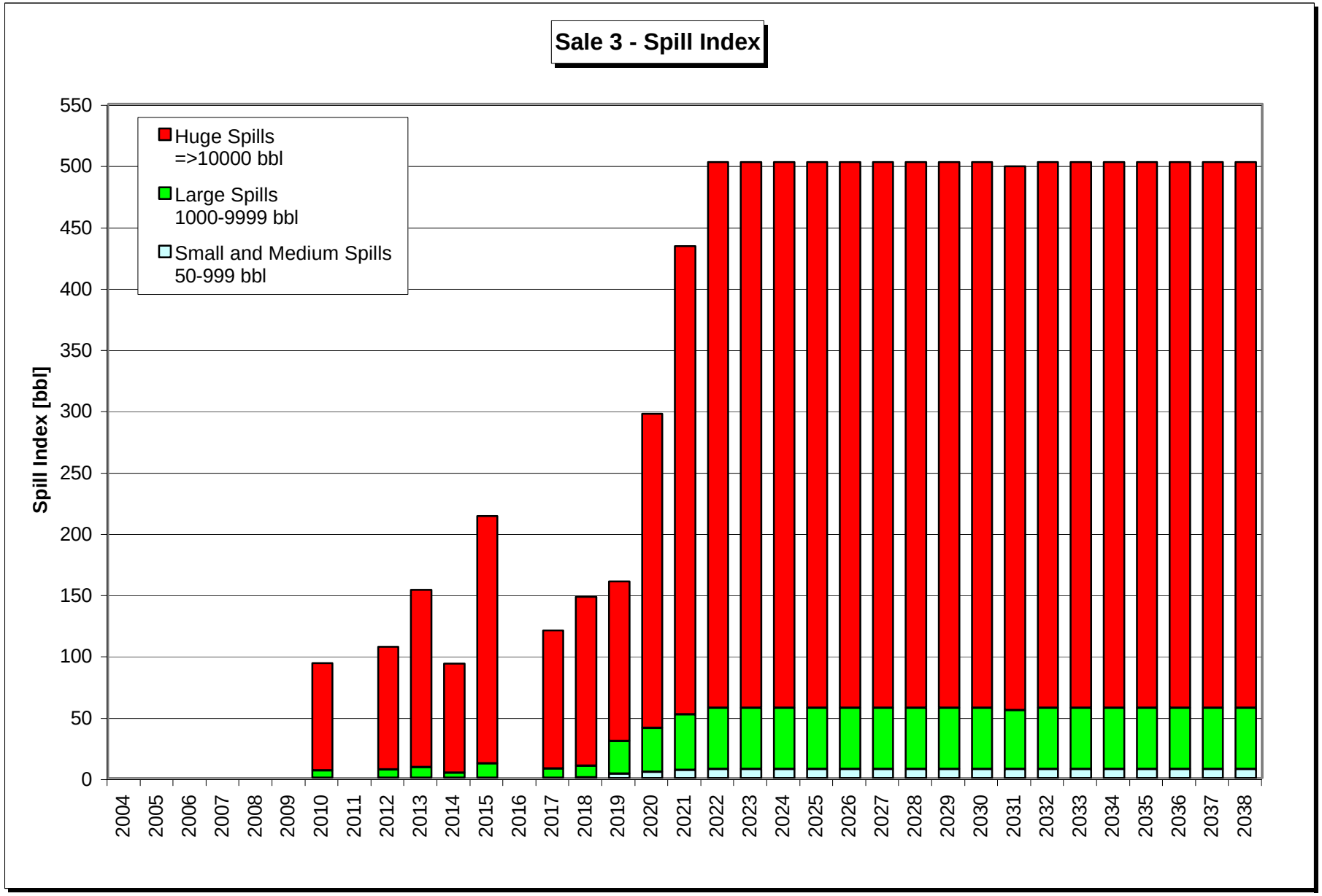
Table 4.3.21
Composition of Spill Indicators - Sale 3 - LOF Average

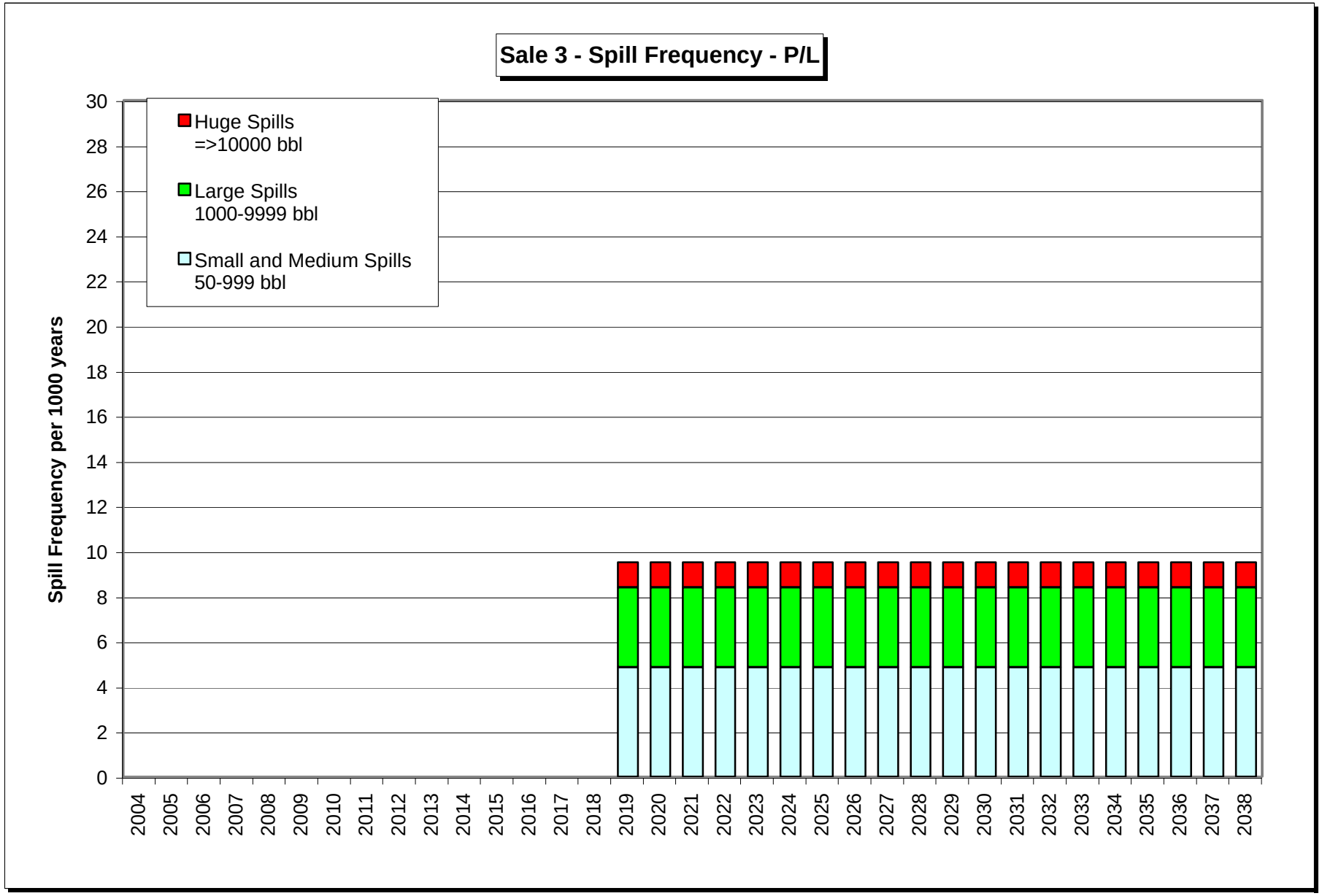
Spill Size	Spill Source									
	P/L		Platforms		Wells		Platforms and Wells		All	
	Sale 3 - LOF Average Spill Frequency per 10^3 years									
Small and Medium Spills 50-999 bbl	3.336	51%	7.484	86%	0.499	11%	7.984	60%	11.320	57%
Large Spills 1000-9999 bbl	2.444	37%	0.633	7%	1.498	33%	2.132	16%	4.575	23%
Huge Spills =>10000 bbl	0.771	12%	0.633	7%	2.496	56%	3.130	24%	3.901	20%
Significant Spills =>1000 bbl	3.215	49%	1.267	14%	3.995	89%	5.261	40%	8.476	43%
All Spills	**6.551**	**100%**	**8.751**	**100%**	**4.494**	**100%**	**13.245**	**100%**	**19.796**	**100%**
	Sale 3 - LOF Average Spill Frequency per 10^9 bbl produced									
Small and Medium Spills 50-999 bbl	0.210	51%	0.472	86%	0.031	11%	0.504	60%	0.714	57%
Large Spills 1000-9999 bbl	0.154	37%	0.040	7%	0.094	33%	0.134	16%	0.289	23%
Huge Spills =>10000 bbl	0.049	12%	0.040	7%	0.157	56%	0.197	24%	0.246	20%
Significant Spills =>1000 bbl	0.203	49%	0.080	14%	0.252	89%	0.332	40%	0.535	43%
All Spills	**0.413**	**100%**	**0.552**	**100%**	**0.283**	**100%**	**0.835**	**100%**	**1.249**	**100%**
	Sale 3 - LOF Average Spill Index [bbl]									
Small and Medium Spills 50-999 bbl	1	5%	3	32%	0	0%	4	1%	5	1%
Large Spills 1000-9999 bbl	13	49%	4	34%	18	6%	22	7%	35	10%
Huge Spills =>10000 bbl	12	46%	4	34%	302	94%	306	92%	317	89%
Significant Spills =>1000 bbl	25	95%	7	68%	321	100%	328	99%	352	99%
All Spills	**26**	**100%**	**11**	**100%**	**321**	**100%**	**331**	**100%**	**357**	**100%**

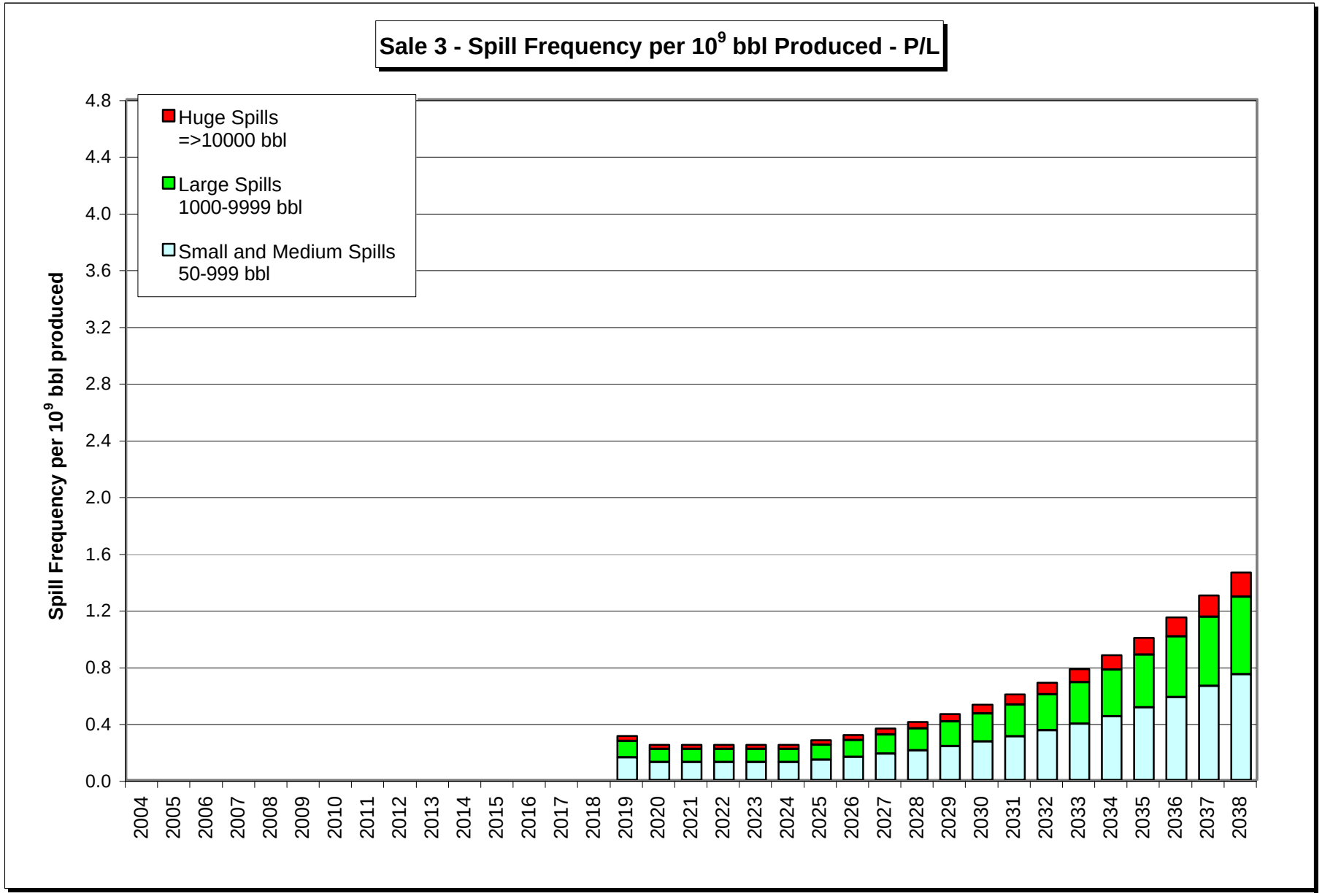
Spill Source	Spill Size									
	S+M 50-999 bbl		Large 1000-9999 bbl		Huge =>10000 bbl		Significant =>1000 bbl		All Spills	
	Sale 3 - LOF Average Spill Frequency per 10^3 years									
P/L	3.336	29%	2.444	53%	0.771	20%	3.215	38%	6.551	33%
Platforms	7.484	66%	0.633	14%	0.633	16%	1.267	15%	8.751	44%
Wells	0.499	4%	1.498	33%	2.496	64%	3.995	47%	4.494	23%
Platforms and Wells	7.984	71%	2.132	47%	3.130	80%	5.261	62%	13.245	67%
All	**11.320**	**100%**	**4.575**	**100%**	**3.901**	**100%**	**8.476**	**100%**	**19.796**	**100%**
	Sale 3 - LOF Average Spill Frequency per 10^9 bbl produced									
P/L	0.210	29%	0.154	53%	0.049	20%	0.203	38%	0.413	33%
Platforms	0.472	66%	0.040	14%	0.040	16%	0.080	15%	0.552	44%
Wells	0.031	4%	0.094	33%	0.157	64%	0.252	47%	0.283	23%
Platforms and Wells	0.504	71%	0.134	47%	0.197	80%	0.332	62%	0.835	67%
All	**0.714**	**100%**	**0.289**	**100%**	**0.246**	**100%**	**0.535**	**100%**	**1.249**	**100%**
	Sale 3 - LOF Average Spill Index [bbl]									
P/L	1	25%	13	36%	12	4%	25	7%	26	7%
Platforms	3	69%	4	10%	4	1%	7	2%	11	3%
Wells	0	5%	18	53%	302	95%	321	91%	321	90%
Platforms and Wells	4	75%	22	64%	306	96%	328	93%	331	93%
All	**5**	**100%**	**35**	**100%**	**317**	**100%**	**352**	**100%**	**357**	**100%**

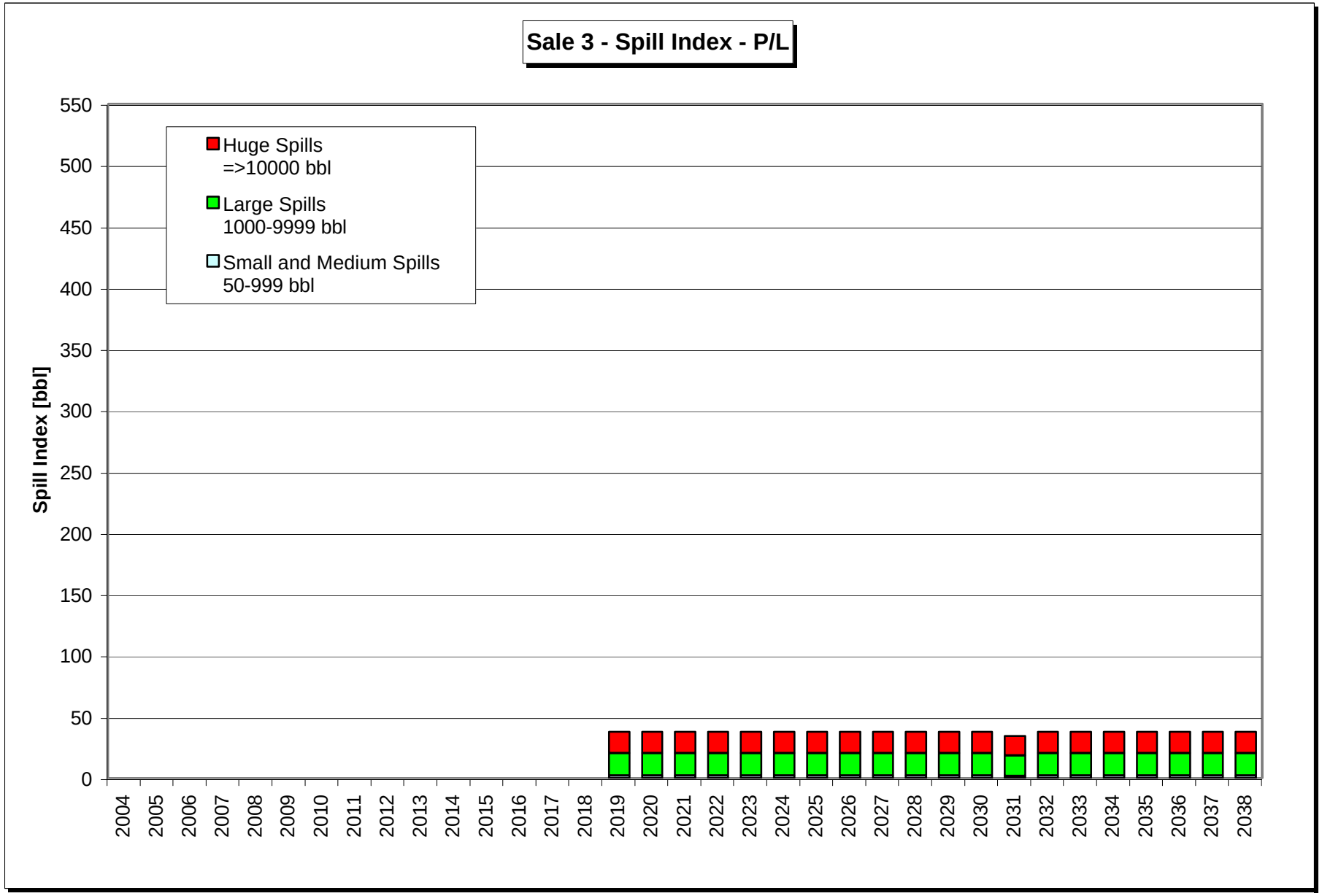

Sale 3 - Spill Frequency
Huge Spills
=>10000 bbl
Large Spills
1000-9999 bbl
Small and Medium Spills
50-999 bbl
Spill Frequency per 1000 years
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
2031
2032
2033
2034
2035
2036
2037
2038

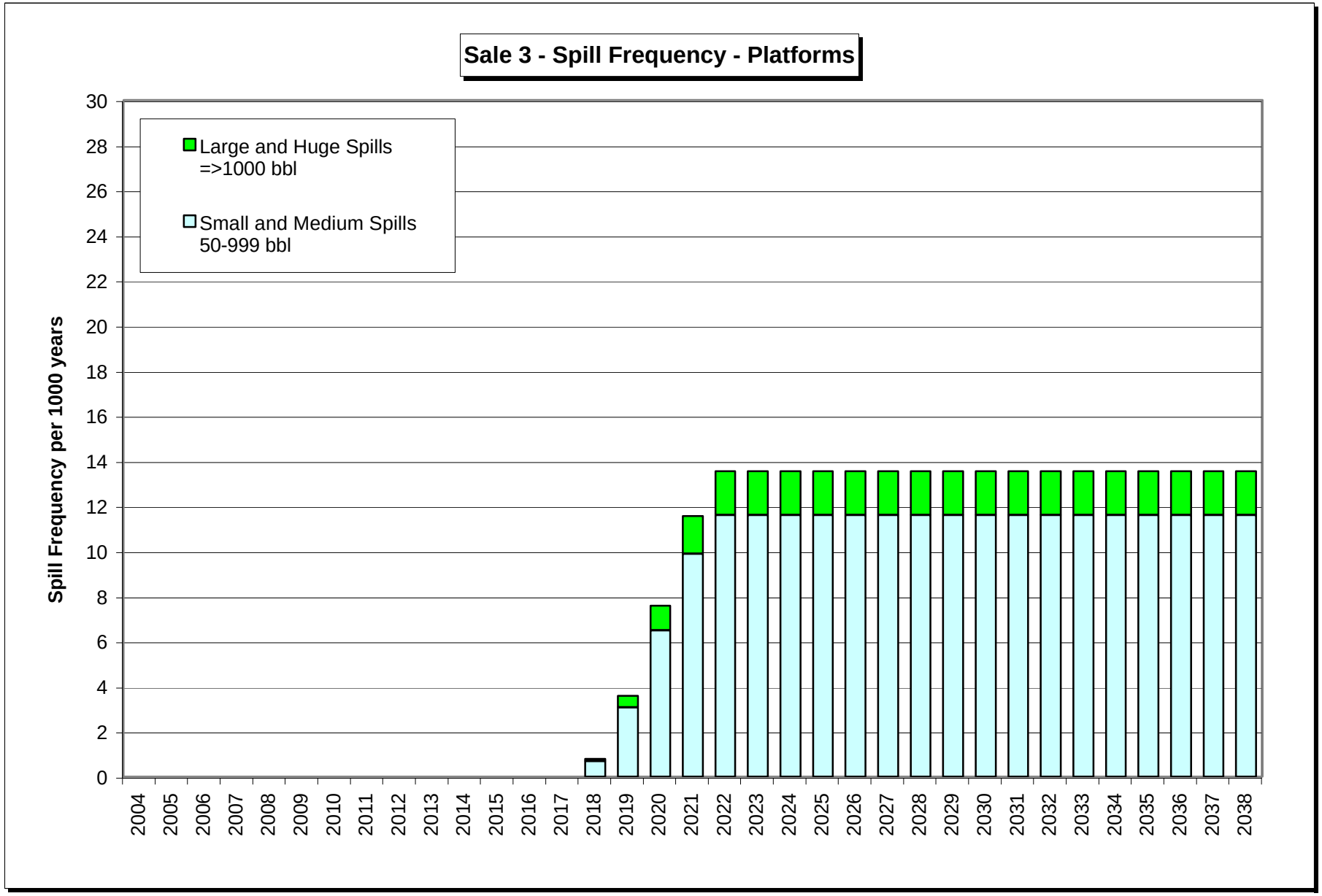

Sale 3 - Spill Frequency per 10^9 bbl Produced
Huge Spills
=>10000 bbl
Large Spills
1000-9999 bbl
Small and Medium Spills
50-999 bbl
Spill Frequency per 10^9 bbl Produced
4.8
4.4
4.0
3.6
3.2
2.8
2.4
2.0
1.6
1.2
0.8
0.4
0.0
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
2031
2032
2033
2034
2035
2036
2037
2038


Sale 3 - Spill Index
Huge Spills
=>10000 bbl
Large Spills
1000-9999 bbl
Small and Medium Spills
50-999 bbl
Spill Index [bbl]
550
500
450
400
350
300
250
200
150
100
50
0
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
2031
2032
2033
2034
2035
2036
2037
2038


Sale 3 - Spill Frequency - P/L
Huge Spills
=>10000 bbl
Large Spills
1000-9999 bbl
Small and Medium Spills
50-999 bbl
Spill Frequency per 1000 years
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
2031
2032
2033
2034
2035
2036
2037
2038


Sale 3 - Spill Frequency per 10^9 bbl Produced - P/L
Huge Spills
=>10000 bbl
Large Spills
1000-9999 bbl
Small and Medium Spills
50-999 bbl
Spill Frequency per 10^9 bbl produced
4.8
4.4
4.0
3.6
3.2
2.8
2.4
2.0
1.6
1.2
0.8
0.4
0.0
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
2031
2032
2033
2034
2035
2036
2037
2038


Sale 3 - Spill Index - P/L
Huge Spills
=>10000 bbl
Large Spills
1000-9999 bbl
Small and Medium Spills
50-999 bbl
Spill Index [bbl]
550
500
450
400
350
300
250
200
150
100
50
0
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
2031
2032
2033
2034
2035
2036
2037
2038


Sale 3 - Spill Frequency - Platforms
Large and Huge Spills =>1000 bbl
Small and Medium Spills 50-999 bbl
Spill Frequency per 1000 years
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
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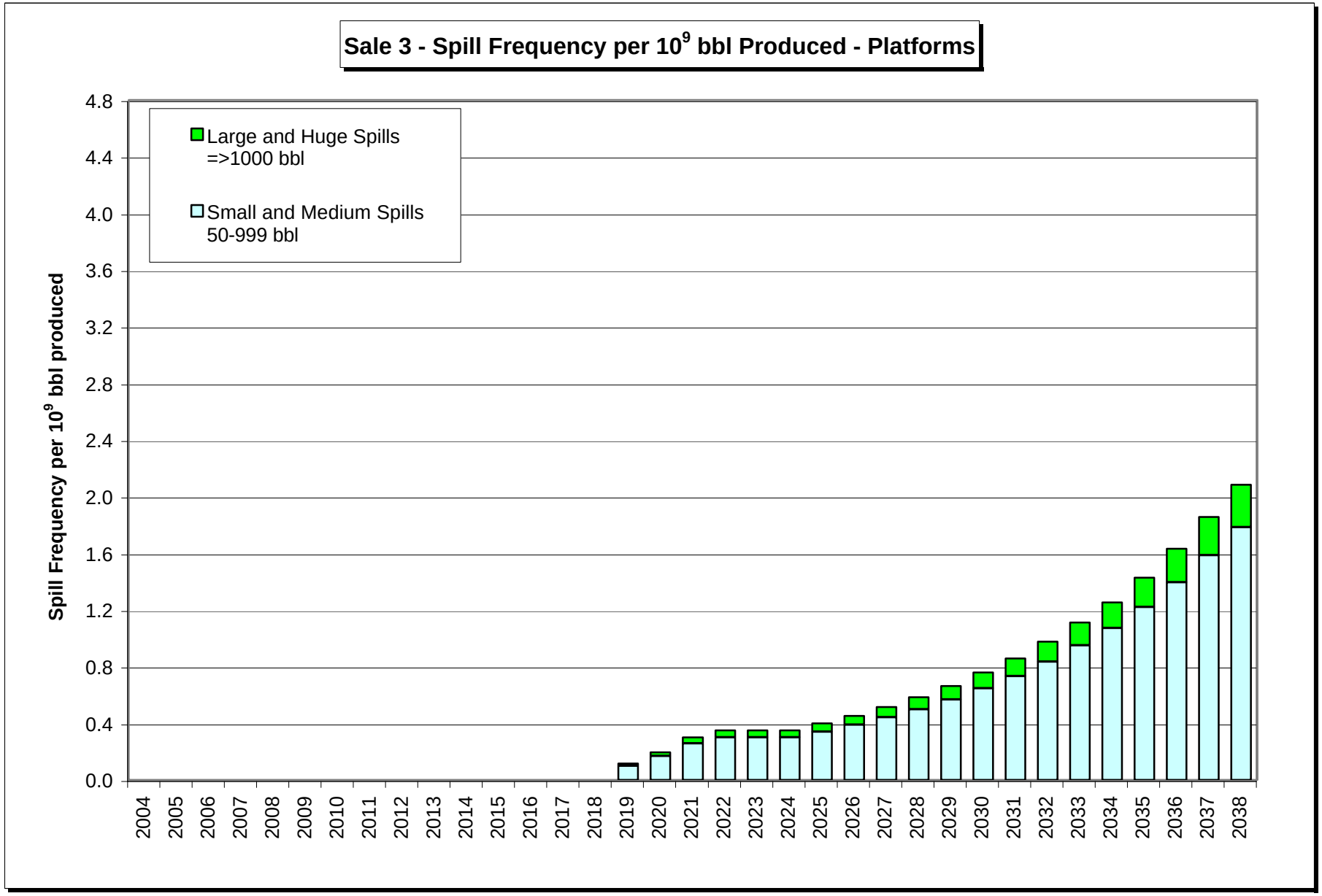
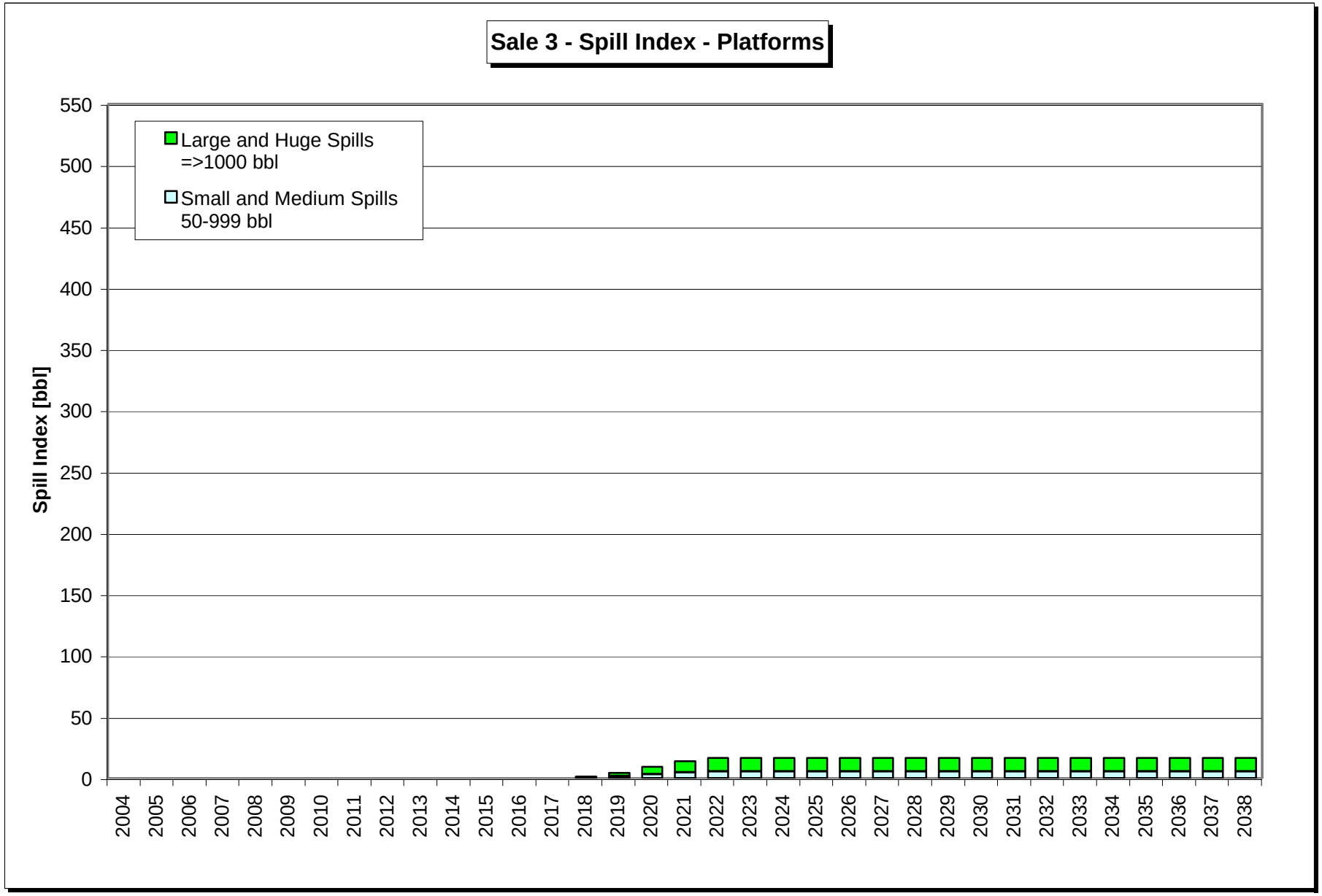
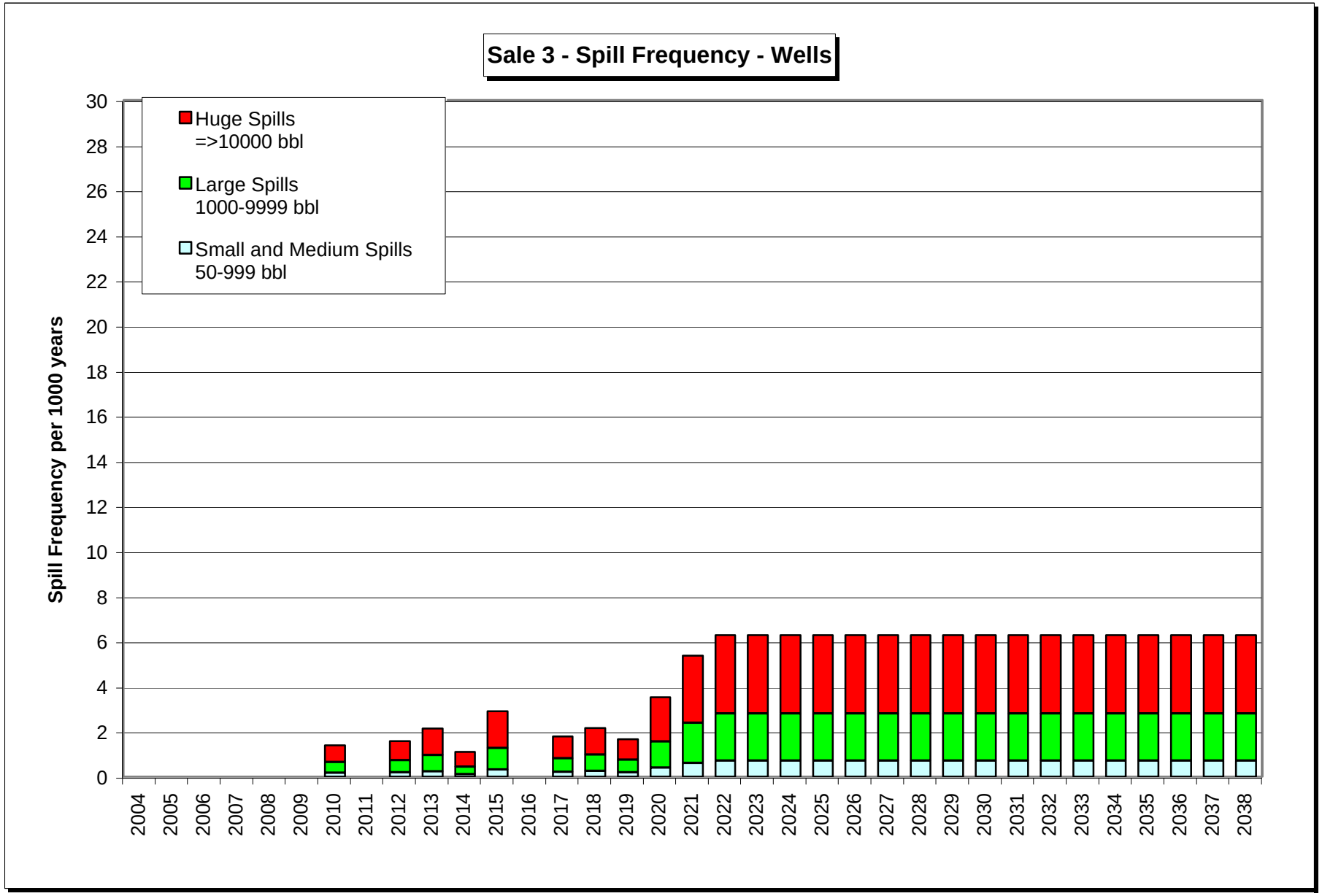
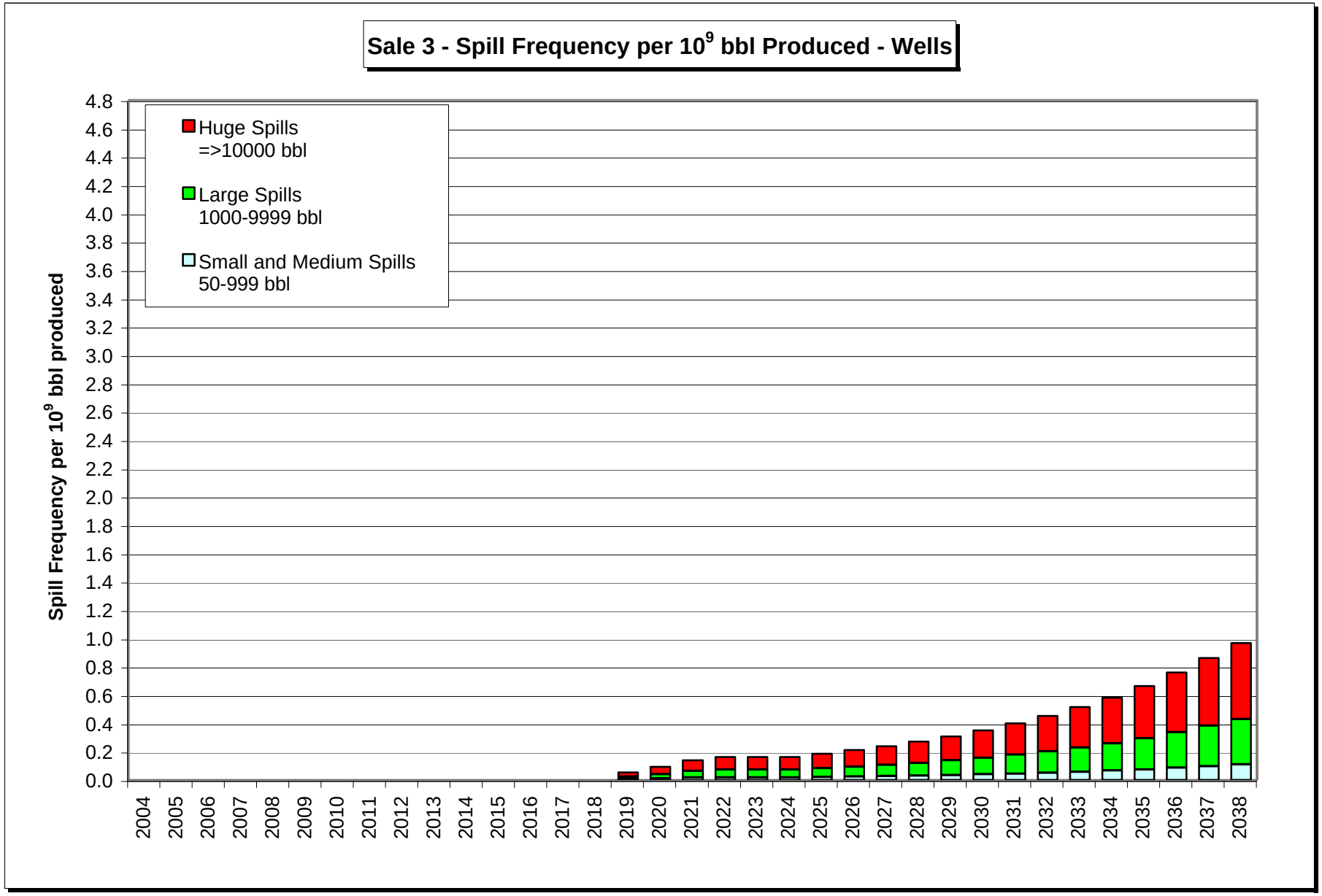
2027
2028
2029
2030
2031
2032
2033
2034
2035
2036
2037
2038


Sale 3 - Spill Frequency per 10^9 bbl Produced - Platforms
Large and Huge Spills =>1000 bbl
Small and Medium Spills 50-999 bbl
Spill Frequency per 10^9 bbl produced
4.8
4.4
4.0
3.6
3.2
2.8
2.4
2.0
1.6
1.2
0.8
0.4
0.0
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
2031
2032
2033
2034
2035
2036
2037
2038


Sale 3 - Spill Index - Platforms
Large and Huge Spills =>1000 bbl
Small and Medium Spills 50-999 bbl
Spill Index [bbl]
550
500
450
400
350
300
250
200
150
100
50
0
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
2031
2032
2033
2034
2035
2036
2037
2038


Sale 3 - Spill Frequency - Wells
Huge Spills
=>10000 bbl
Large Spills
1000-9999 bbl
Small and Medium Spills
50-999 bbl
Spill Frequency per 1000 years
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
30
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
2031
2032
2033
2034
2035
2036
2037
2038


Sale 3 - Spill Frequency per 10^9 bbl Produced - Wells
Huge Spills
=>10000 bbl
Large Spills
1000-9999 bbl
Small and Medium Spills
50-999 bbl
Spill Frequency per 10^9 bbl produced
4.8
4.6
4.4
4.2
4.0
3.8
3.6
3.4
3.2
3.0
2.8
2.6
2.4
2.2
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
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2031
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2034
2035
2036
2037
2038

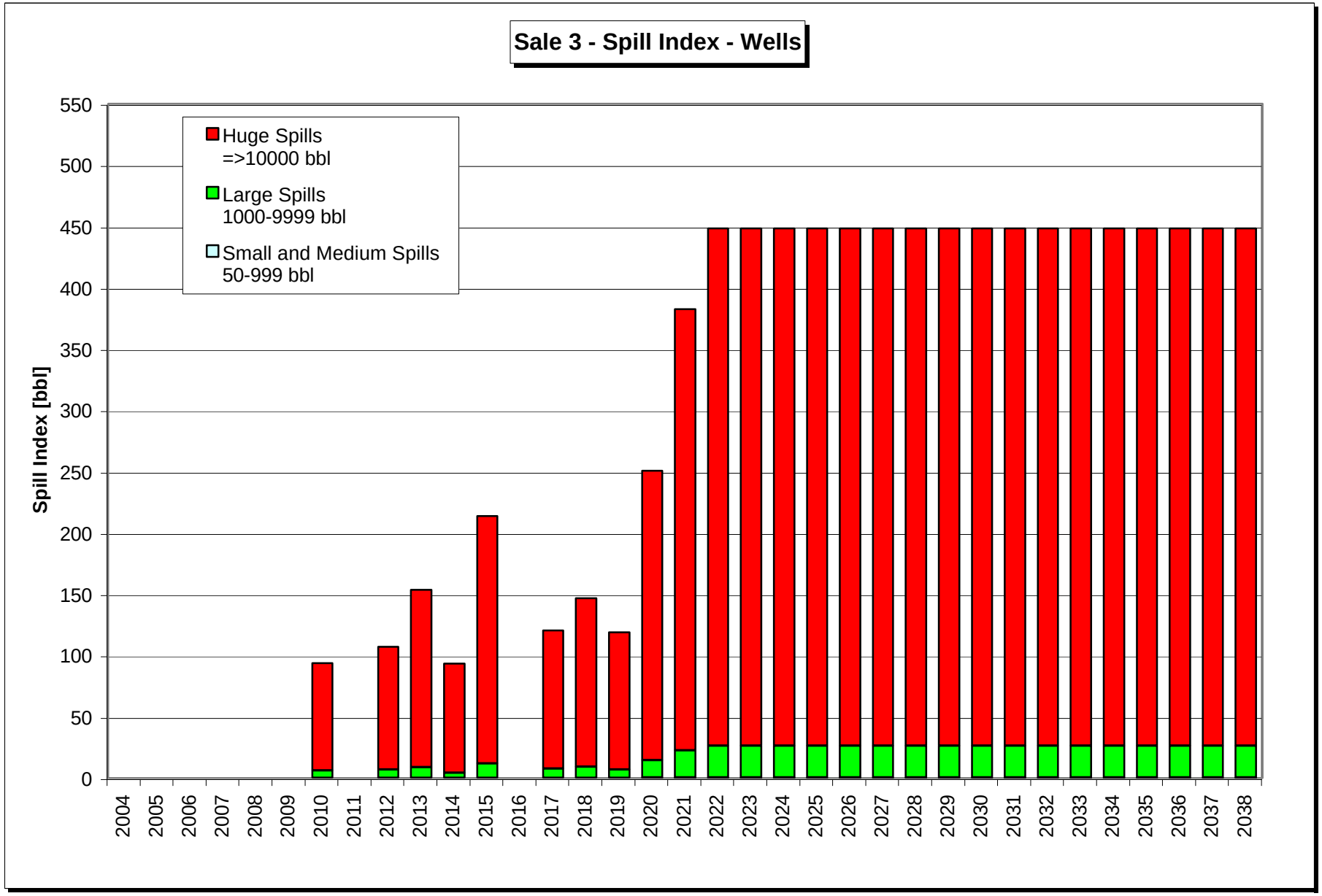
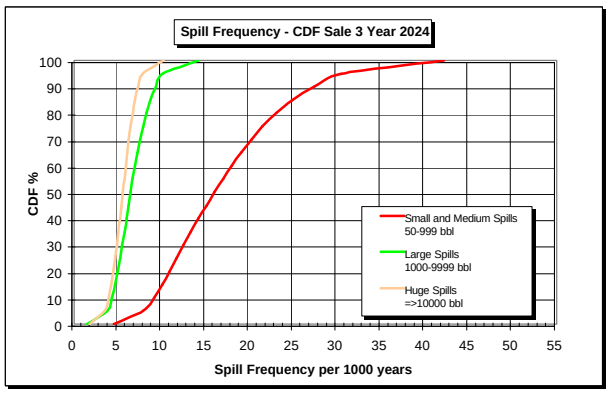
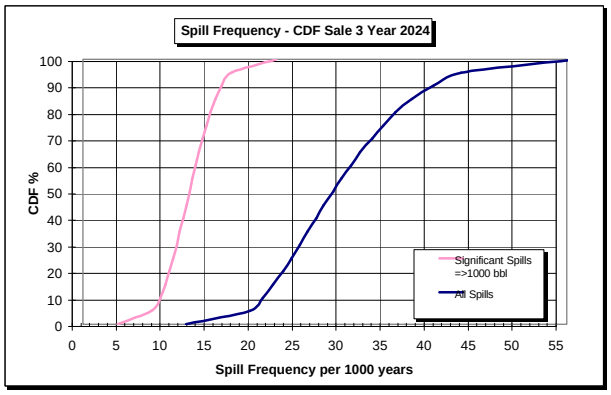
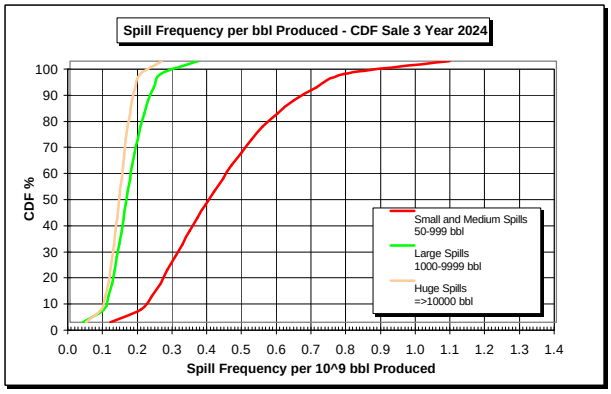
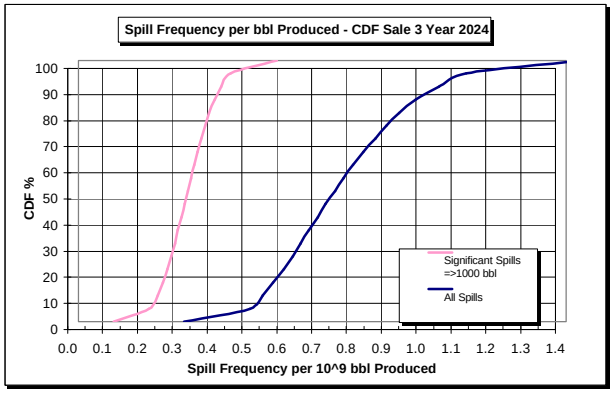

Sale 3 - Spill Index - Wells
Huge Spills
=>10000 bbl
Large Spills
1000-9999 bbl
Small and Medium Spills
50-999 bbl
Spill Index [bbl]
550
500
450
400
350
300
250
200
150
100
50
0
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
2031
2032
2033
2034
2035
2036
2037
2038

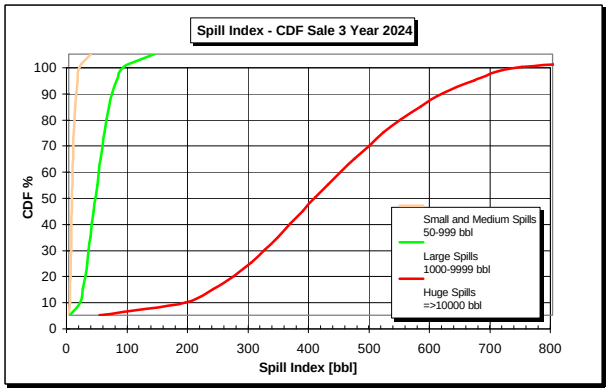
Figure 4.3.13 Spill Indicators - CDF - Year 2024











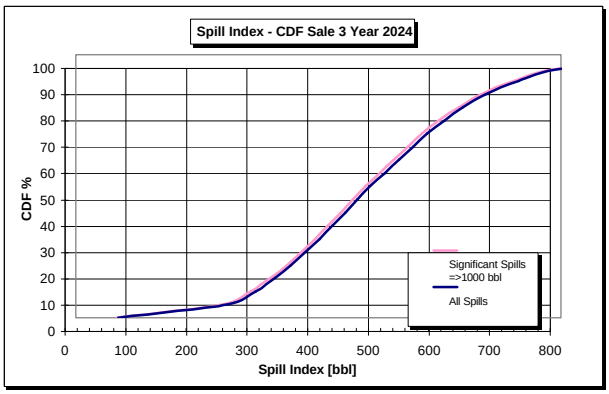


Figure 4.3.14 Spill Frequency - CDF - Sale 3

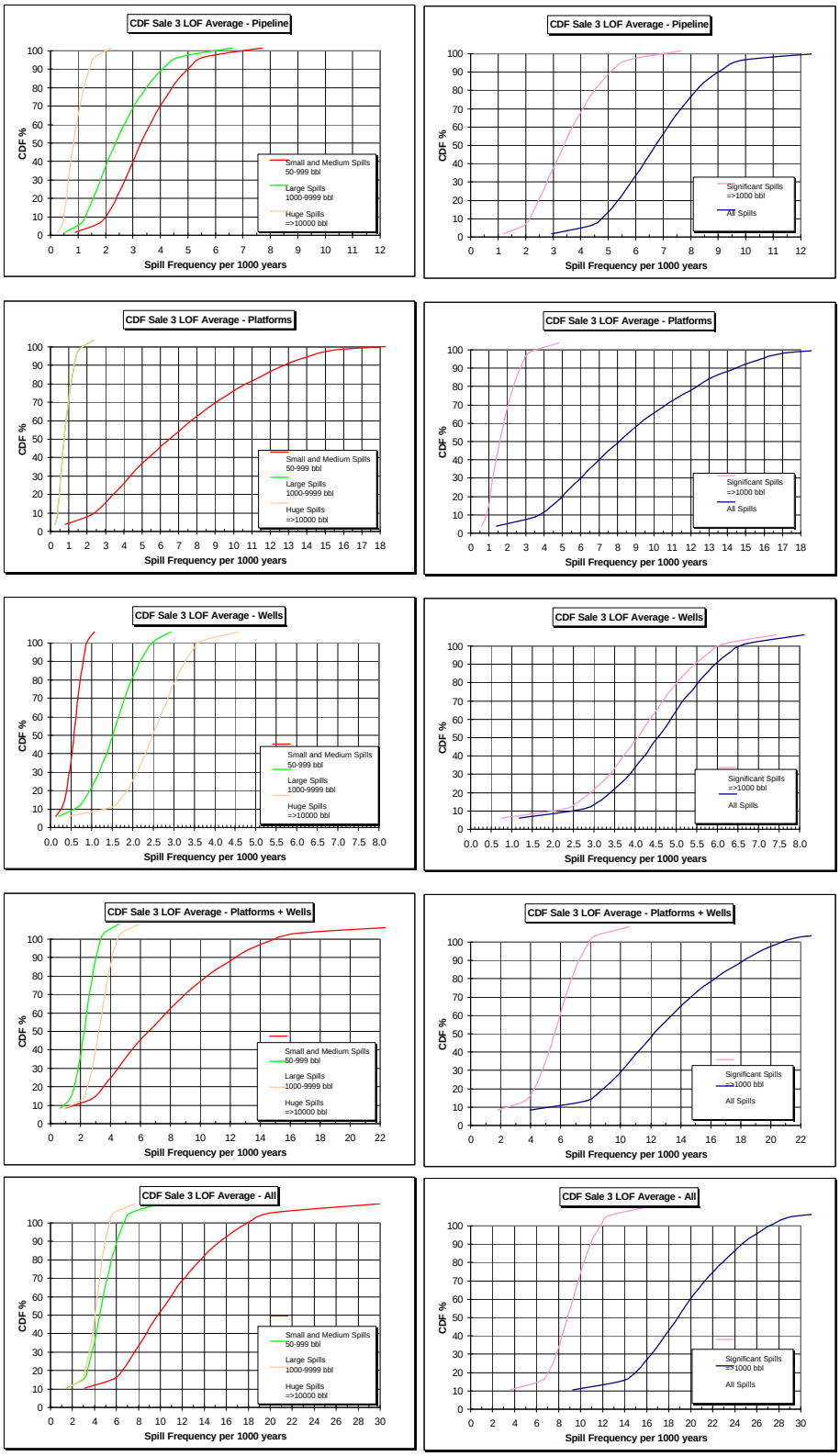


Figure 4.3.15 Spill Frequency per bbl produced - CDF - Sale 3

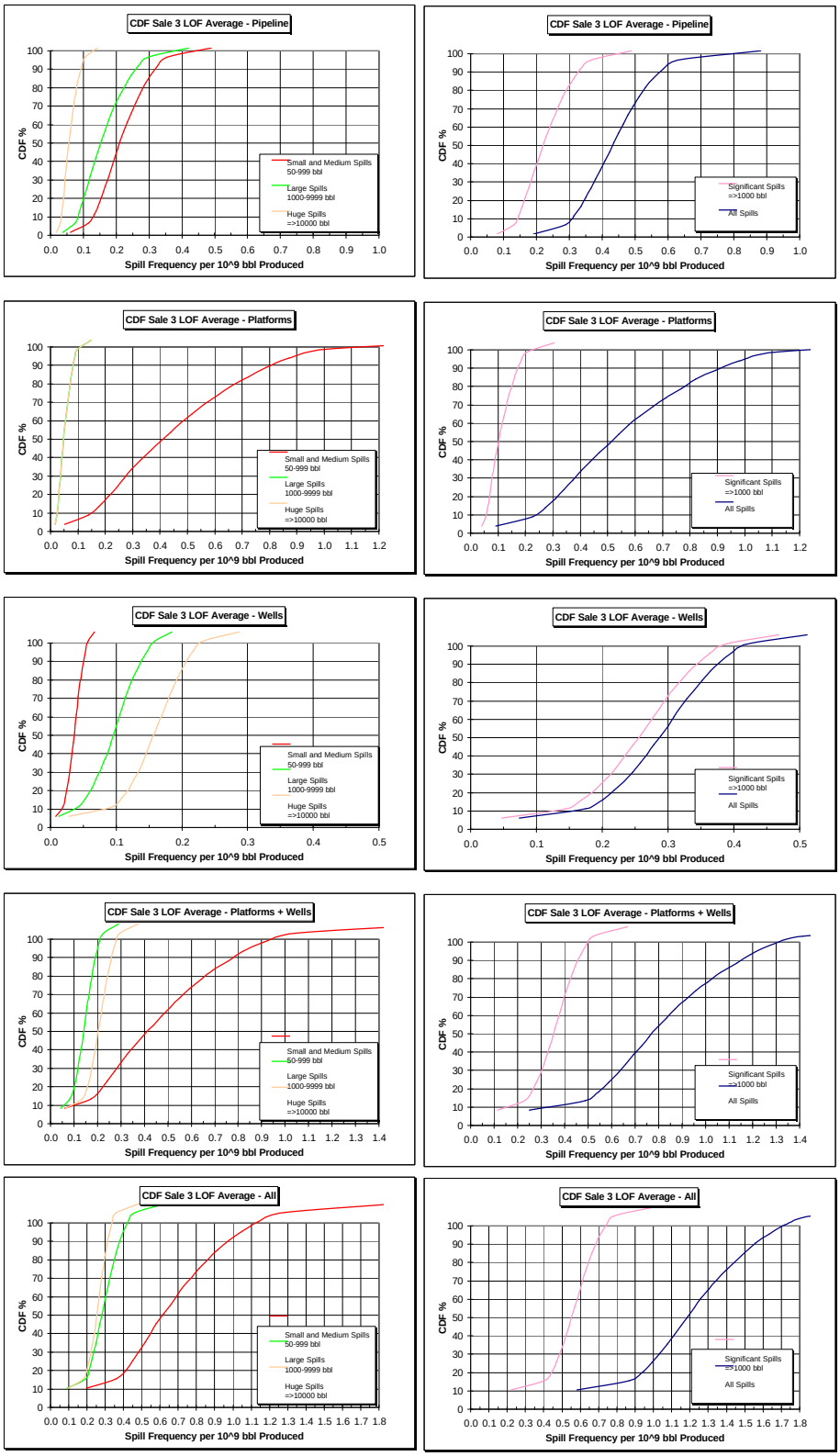


Figure 4.3.16 Spill Index [bbl] - CDF - Sale 3

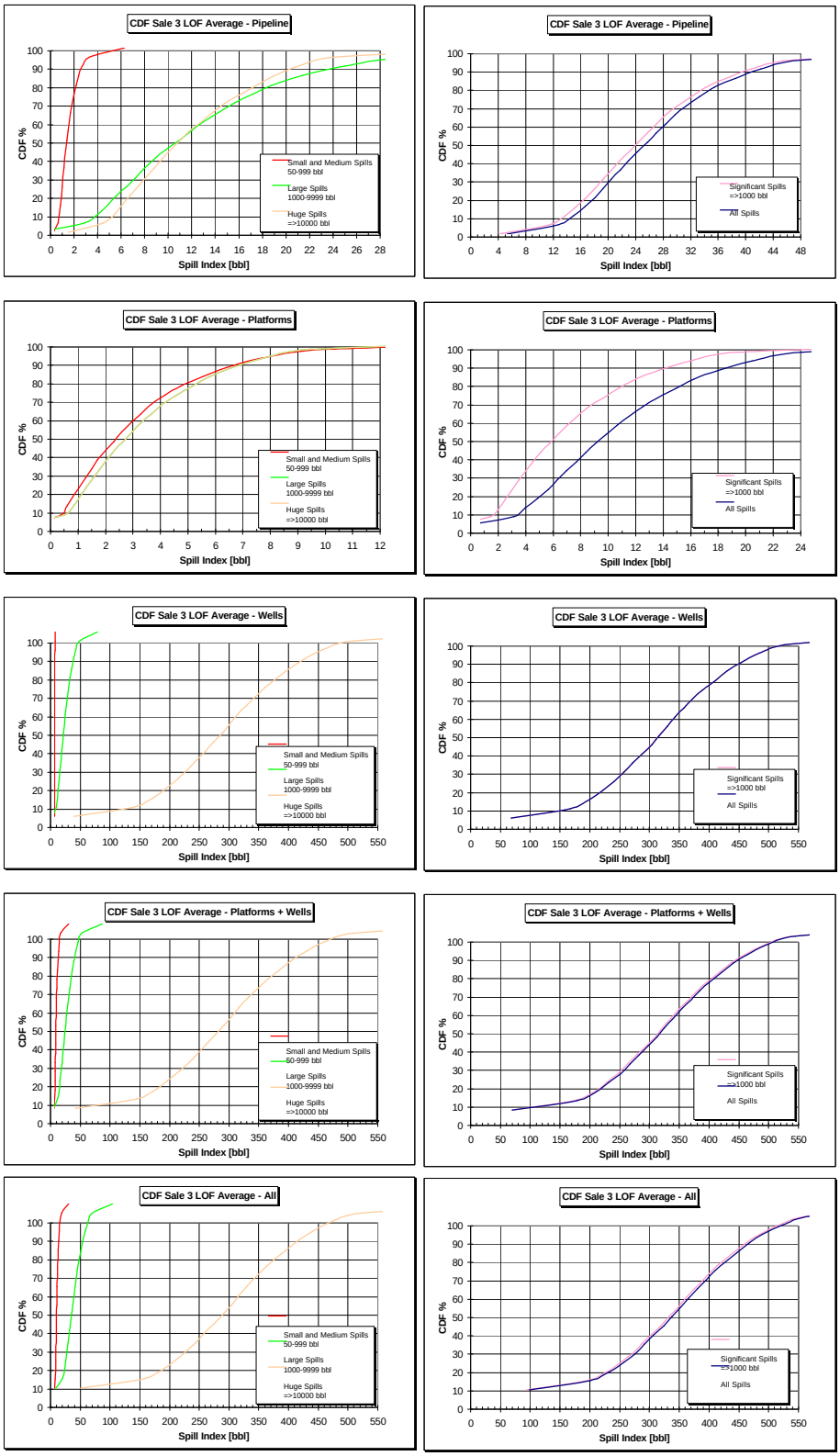
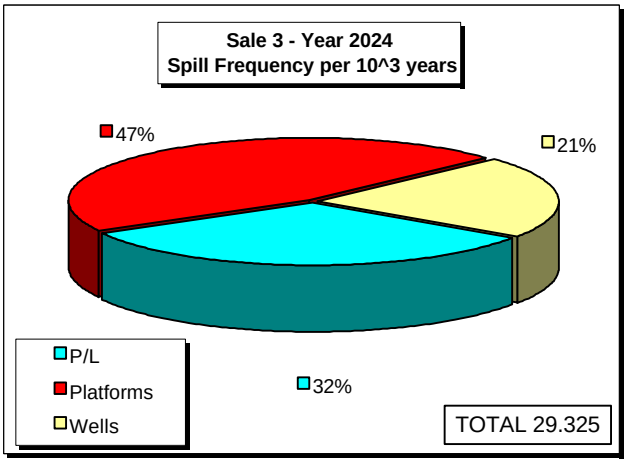
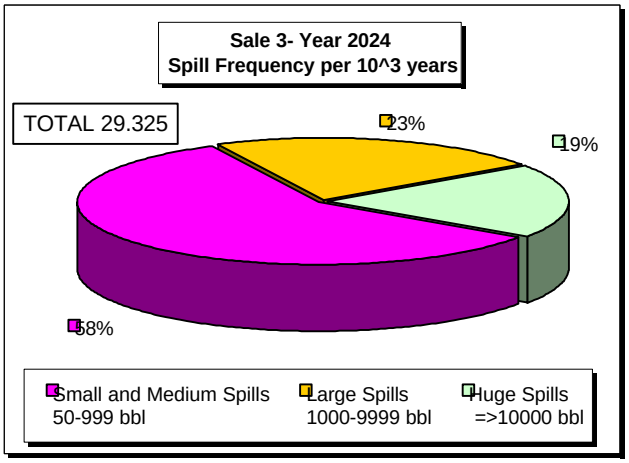


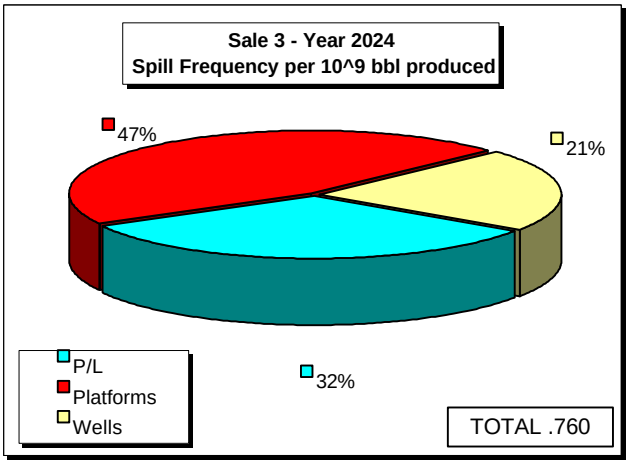
Figure 4.3.17
Sale 3 - Year 2024 - Spill Indicators

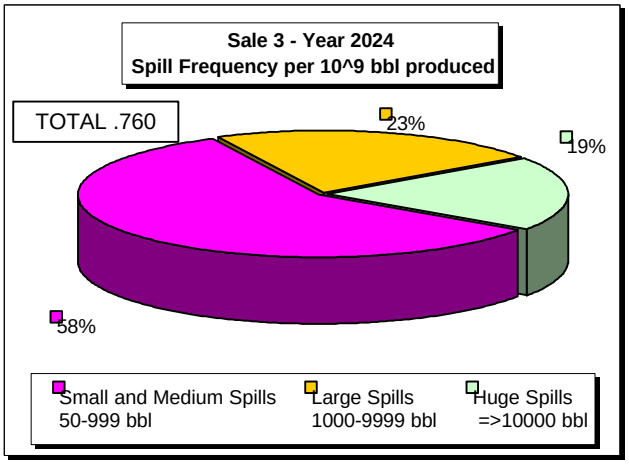
BY SPILL SOURCE

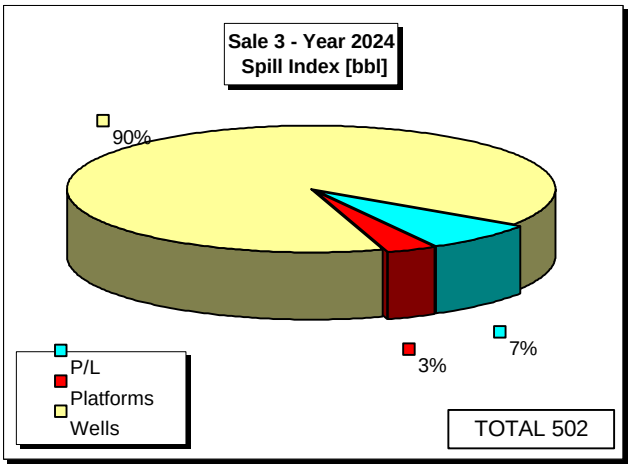


BY SPILL SIZE









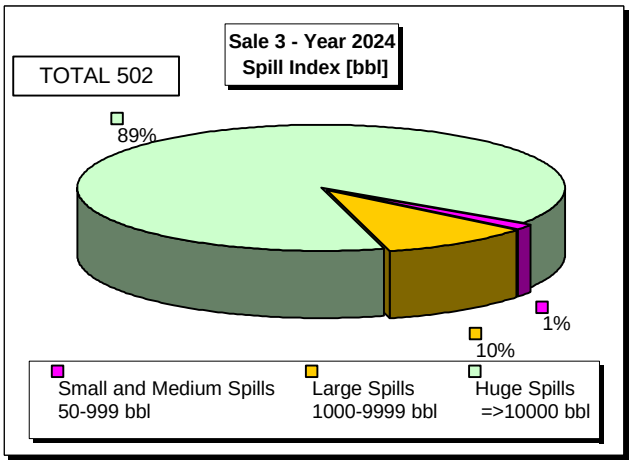
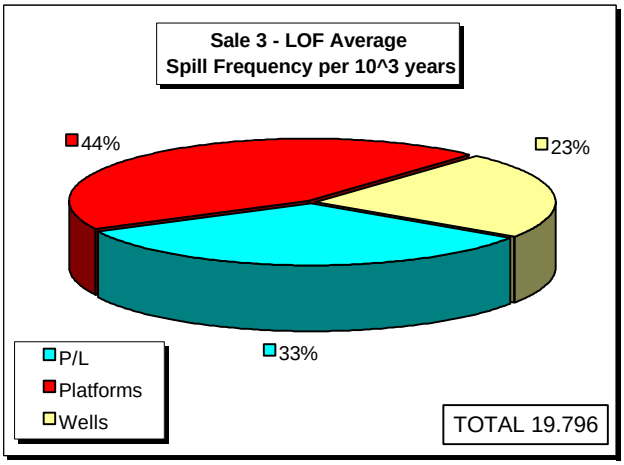
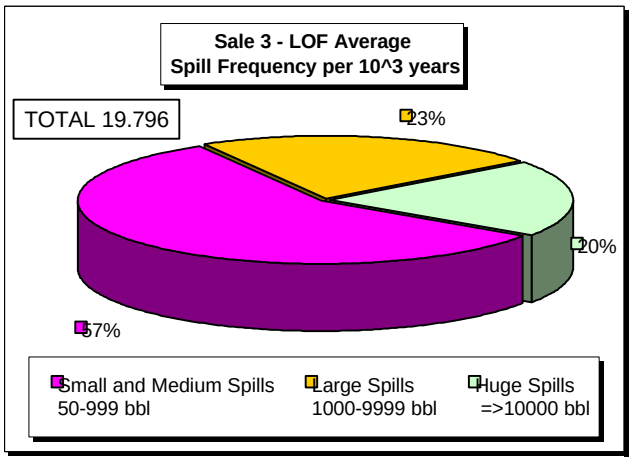


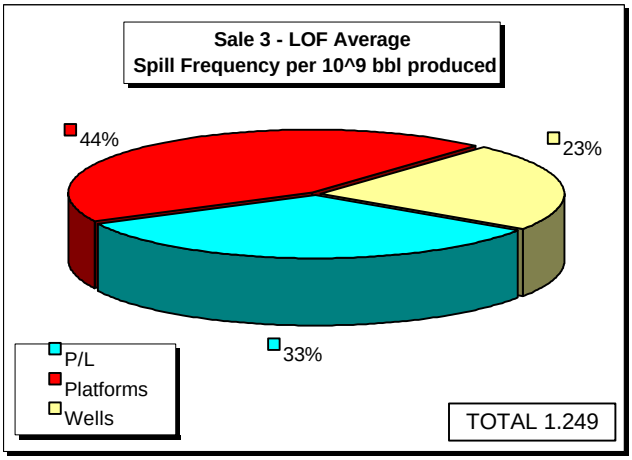
Figure 4.3.18
Sale 3 - LOF Average Spill Indicators

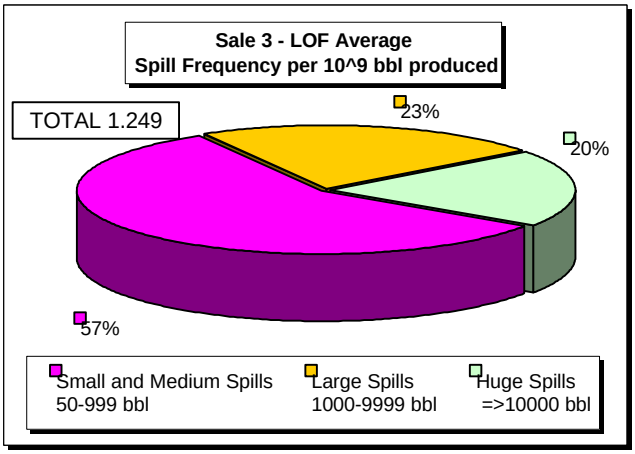
BY SPILL SOURCE

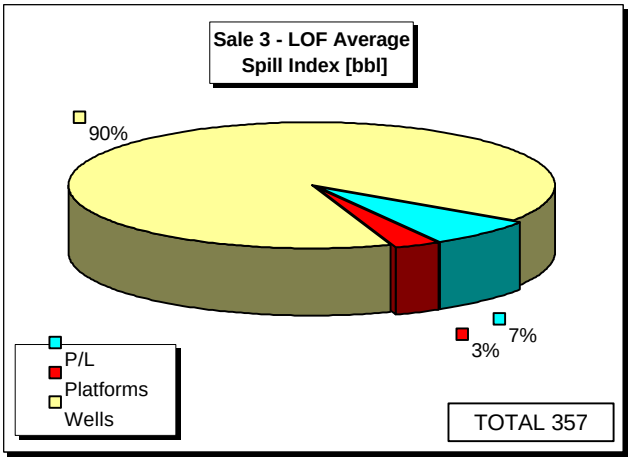


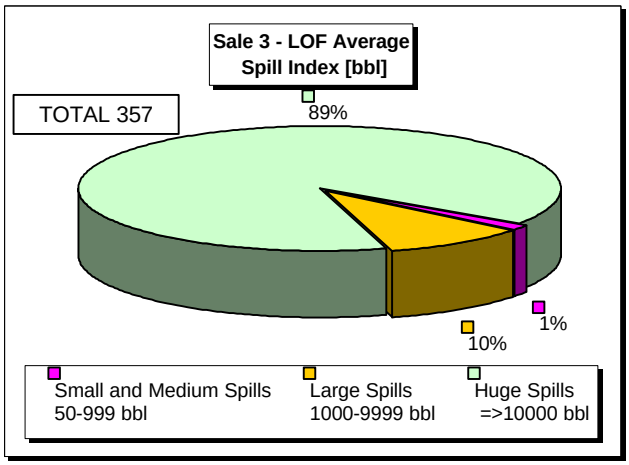
BY SPILL SIZE











APPENDIX 4
Spill Occurrence

4.4
Arctic Spill Occurrence
Beaufort Sea Sale All

Table 4.4.1
Arctic Spill Occurrence Beaufort Sea Sale All P/L Spills

Year	Water Depth	P/L Dia <10"													P/L Dia >= 10"												
		P/L [miles]	Small Spills 50-99 bbl			Medium Spills 100-999 bbl			Large Spills 1000-9999 bbl			Huge Spills =>10000 bbl			P/L [miles]	Small Spills 50-99 bbl			Medium Spills 100-999 bbl			Large Spills 1000-9999 bbl			Huge Spills =>10000 bbl		
			Expected Spill [bbl] =		71	Expected Spill [bbl] =		485	Expected Spill [bbl] =		5279	Expected Spill [bbl] =		14880		Expected Spill [bbl] =		71	Expected Spill [bbl] =		516	Expected Spill [bbl] =		5176	Expected Spill [bbl] =		15552
		Cumm.	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl	Cumm.	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl
2004	Shallow		3.671			6.432			4.375			1.144				2.519			5.975			6.870			2.200		
	Medium		3.587			6.283			4.004			1.041				2.433			5.826			6.476			2.087		
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total																										
2005	Shallow		3.671			6.432			4.375			1.144				2.519			5.975			6.870			2.200		
	Medium		3.587			6.283			4.004			1.041				2.433			5.826			6.476			2.087		
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total																										
2006	Shallow		3.671			6.432			4.375			1.144				2.519			5.975			6.870			2.200		
	Medium		3.587			6.283			4.004			1.041				2.433			5.826			6.476			2.087		
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total																										
2007	Shallow		3.671			6.432			4.375			1.144				2.519			5.975			6.870			2.200		
	Medium		3.587			6.283			4.004			1.041				2.433			5.826			6.476			2.087		
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total																										
2008	Shallow		3.671			6.432			4.375			1.144				2.519			5.975			6.870			2.200		
	Medium		3.587			6.283			4.004			1.041				2.433			5.826			6.476			2.087		
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total																										
2009	Shallow		3.671			6.432			4.375			1.144				2.519			5.975			6.870			2.200		
	Medium		3.587			6.283			4.004			1.041				2.433			5.826			6.476			2.087		
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total																										
2010	Shallow		3.671			6.432			4.375			1.144			10	2.519	0.405	0.03	5.975	0.961	0.50	6.870	1.105	5.72	2.200	0.354	5.50
	Medium		3.587			6.283			4.004			1.041				2.433			5.826			6.476			2.087		
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total														**10**		**0.405**	**0.03**		**0.961**	**0.50**		**1.105**	**5.72**		**0.354**	**5.50**
2011	Shallow		3.671			6.432			4.375			1.144			10	2.519	0.405	0.03	5.975	0.961	0.50	6.870	1.105	5.72	2.200	0.354	5.50
	Medium		3.587			6.283			4.004			1.041				2.433			5.826			6.476			2.087		
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total														**10**		**0.405**	**0.03**		**0.961**	**0.50**		**1.105**	**5.72**		**0.354**	**5.50**
2012	Shallow		3.671			6.432			4.375			1.144			20	2.519	0.811	0.06	5.975	1.923	0.99	6.870	2.211	11.44	2.200	0.708	11.01
	Medium		3.587			6.283			4.004			1.041				2.433			5.826			6.476			2.087		
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total														**20**		**0.811**	**0.06**		**1.923**	**0.99**		**2.211**	**11.44**		**0.708**	**11.01**
2013	Shallow		3.671			6.432			4.375			1.144			30	2.519	1.216	0.09	5.975	2.884	1.49	6.870	3.316	17.16	2.200	1.062	16.51
	Medium		3.587			6.283			4.004			1.041				2.433			5.826			6.476			2.087		
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total														**30**		**1.216**	**0.09**		**2.884**	**1.49**		**3.316**	**17.16**		**1.062**	**16.51**
2014	Shallow		3.671			6.432			4.375			1.144			30	2.519	1.216	0.09	5.975	2.884	1.49	6.870	3.316	17.16	2.200	1.062	16.51
	Medium		3.587			6.283			4.004			1.041				2.433			5.826			6.476			2.087		
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total														**30**		**1.216**	**0.09**		**2.884**	**1.49**		**3.316**	**17.16**		**1.062**	**16.51**
2015	Shallow		3.671			6.432			4.375			1.144			40	2.519	1.621	0.12	5.975	3.846	1.98	6.870	4.422	22.89	2.200	1.416	22.02
	Medium		3.587			6.283			4.004			1.041			10	2.433	0.391	0.03	5.826	0.937	0.48	6.476	1.042	5.39	2.087	0.336	5.22
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total														**50**		**2.013**	**0.14**		**4.783**	**2.47**		**5.464**	**28.28**		**1.752**	**27.24**
2016	Shallow		3.671			6.432			4.375			1.144			40	2.519	1.621	0.12	5.975	3.846	1.98	6.870	4.422	22.89	2.200	1.416	22.02
	Medium		3.587			6.283			4.004			1.041			10	2.433	0.391	0.03	5.826	0.937	0.48	6.476	1.042	5.39	2.087	0.336	5.22
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total														**50**		**2.013**	**0.14**		**4.783**	**2.47**		**5.464**	**28.28**		**1.752**	**27.24**
2017	Shallow		3.671			6.432			4.375			1.144			50	2.519	2.027	0.14	5.975	4.807	2.48	6.870	5.527	28.61	2.200	1.770	27.52
	Medium	5	3.587	0.289	0.02	6.283	0.505	0.25	4.004	0.322	1.70	1.041	0.084	1.25	25	2.433	0.979	0.07	5.826	2.343	1.21	6.476	2.605	13.48	2.087	0.839	13.05
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total	**5**		**0.289**	**0.02**		**0.505**	**0.25**		**0.322**	**1.70**		**0.084**	**1.25**	**75**		**3.005**	**0.21**		**7.151**	**3.69**		**8.132**	**42.09**		**2.609**	**40.58**
2018	Shallow		3.671			6.432			4.375			1.144			50	2.519	2.027	0.14	5.975	4.807	2.48	6.870	5.527	28.61	2.200	1.770	27.52
	Medium	5	3.587	0.289	0.02	6.283	0.505	0.25	4.004	0.322	1.70	1.041	0.084	1.25	25	2.433	0.979	0.07	5.826	2.343	1.21	6.476	2.605	13.48	2.087	0.839	13.05
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total	**5**		**0.289**	**0.02**		**0.505**	**0.25**		**0.322**	**1.70**		**0.084**	**1.25**	**75**		**3.005**	**0.21**		**7.151**	**3.69**		**8.132**	**42.09**		**2.609**	**40.58**
2019	Shallow		3.671			6.432			4.375			1.144			65	2.519	2.635	0.19	5.975	6.249	3.22	6.870	7.185	37.19	2.200	2.301	35.78
	Medium	10	3.587	0.577	0.04	6.283	1.011	0.49	4.004	0.644	3.40	1.041	0.168	2.49	40	2.433	1.566	0.11	5.826	3.749	1.93	6.476	4.168	21.57	2.087	1.343	20.89
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total	**10**		**0.577**	**0.04**		**1.011**	**0.49**		**0.644**	**3.40**		**0.168**	**2.49**	**105**		**4.200**	**0.30**		**9.999**	**5.16**		**11.353**	**58.76**		**3.644**	**56.67**
2020	Shallow		3.671			6.432			4.375			1.144			65	2.519	2.635	0.19	5.975	6.249	3.22	6.870	7.185	37.19	2.200	2.301	35.78
	Medium	10	3.587	0.577	0.04	6.283	1.011	0.49	4.004	0.644	3.40	1.041	0.168	2.49	40	2.433	1.566	0.11	5.826	3.749	1.93	6.476	4.168	21.57	2.087	1.343	20.89
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total	**10**		**0.577**	**0.04**		**1.011**	**0.49**		**0.644**	**3.40**		**0.168**	**2.49**	**105**		**4.200**	**0.30**		**9.999**	**5.16**		**11.353**	**58.76**		**3.644**	**56.67**
2021	Shallow		3.671			6.432			4.375			1.144			65	2.519	2.635	0.19	5.975	6.249	3.22	6.870	7.185	37.19	2.200	2.301	35.78
	Medium	10	3.587	0.577	0.04	6.283	1.011	0.49	4.004	0.644	3.40	1.041	0.168	2.49	40	2.433	1.566	0.11	5.826	3.749	1.93	6.476	4.168	21.57	2.087	1.343	20.89
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total	**10**		**0.577**	**0.04**		**1.011**	**0.49**		**0.644**	**3.40**		**0.168**	**2.49**	**105**		**4.200**	**0.30**		**9.999**	**5.16**		**11.353**	**58.76**		**3.644**	**56.67**
2022	Shallow		3.671			6.432			4.375			1.144			65	2.519	2.635	0.19	5.975	6.249	3.22	6.870	7.185	37.19	2.200	2.301	35.78
	Medium	10	3.587	0.577	0.04	6.283	1.011	0.49	4.004	0.644	3.40	1.041	0.168	2.49	40	2.433	1.566	0.11	5.826	3.749	1.93	6.476	4.168	21.57	2.087	1.343	20.89
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total	**10**		**0.577**	**0.04**		**1.011**	**0.49**		**0.644**	**3.40**		**0.168**	**2.49**	**105**		**4.200**	**0.30**		**9.999**	**5.16**		**11.353**	**58.76**		**3.644**	**56.67**
2023	Shallow		3.671			6.432			4.375			1.144			65	2.519	2.635	0.19	5.975	6.249	3.22	6.870	7.185	37.19	2.200	2.301	35.78
	Medium	10	3.587	0.577	0.04	6.283	1.011	0.49	4.004	0.644	3.40	1.041	0.168	2.49	40	2.433	1.566	0.11	5.826	3.749	1.93	6.476	4.168	21.57	2.087	1.343	20.89
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		

Table 4.4.1
Arctic Spill Occurrence Beaufort Sea Sale All P/L Spills

Year	Water Depth	P/L Dia <10"													P/L Dia >= 10"												
		P/L [miles]	Small Spills 50-99 bbl			Medium Spills 100-999 bbl			Large Spills 1000-9999 bbl			Huge Spills =>10000 bbl			P/L [miles]	Small Spills 50-99 bbl			Medium Spills 100-999 bbl			Large Spills 1000-9999 bbl			Huge Spills =>10000 bbl		
			Expected Spill [bbl] =		71	Expected Spill [bbl] =		485	Expected Spill [bbl] =		5279	Expected Spill [bbl] =		14880		Expected Spill [bbl] =		71	Expected Spill [bbl] =		516	Expected Spill [bbl] =		5176	Expected Spill [bbl] =		15552
		Cumm.	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl	Cumm.	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl
	Total	**10**		**0.577**	**0.04**		**1.011**	**0.49**		**0.644**	**3.40**		**0.168**	**2.49**	**105**		**4.200**	**0.30**		**9.999**	**5.16**		**11.353**	**58.76**		**3.644**	**56.67**
2024	Shallow		3.671			6.432			4.375			1.144			65	2.519	2.635	0.19	5.975	6.249	3.22	6.870	7.185	37.19	2.200	2.301	35.78
	Medium	10	3.587	0.577	0.04	6.283	1.011	0.49	4.004	0.644	3.40	1.041	0.168	2.49	40	2.433	1.566	0.11	5.826	3.749	1.93	6.476	4.168	21.57	2.087	1.343	20.89
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total	**10**		**0.577**	**0.04**		**1.011**	**0.49**		**0.644**	**3.40**		**0.168**	**2.49**	**105**		**4.200**	**0.30**		**9.999**	**5.16**		**11.353**	**58.76**		**3.644**	**56.67**
2025	Shallow		3.671			6.432			4.375			1.144			55	2.519	2.229	0.16	5.975	5.288	2.73	6.870	6.080	31.47	2.200	1.947	30.27
	Medium	10	3.587	0.577	0.04	6.283	1.011	0.49	4.004	0.644	3.40	1.041	0.168	2.49	40	2.433	1.566	0.11	5.826	3.749	1.93	6.476	4.168	21.57	2.087	1.343	20.89
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total	**10**		**0.577**	**0.04**		**1.011**	**0.49**		**0.644**	**3.40**		**0.168**	**2.49**	**95**		**3.795**	**0.27**		**9.037**	**4.66**		**10.248**	**53.04**		**3.290**	**51.16**
2026	Shallow		3.671			6.432			4.375			1.144			55	2.519	2.229	0.16	5.975	5.288	2.73	6.870	6.080	31.47	2.200	1.947	30.27
	Medium	10	3.587	0.577	0.04	6.283	1.011	0.49	4.004	0.644	3.40	1.041	0.168	2.49	40	2.433	1.566	0.11	5.826	3.749	1.93	6.476	4.168	21.57	2.087	1.343	20.89
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total	**10**		**0.577**	**0.04**		**1.011**	**0.49**		**0.644**	**3.40**		**0.168**	**2.49**	**95**		**3.795**	**0.27**		**9.037**	**4.66**		**10.248**	**53.04**		**3.290**	**51.16**
2027	Shallow		3.671			6.432			4.375			1.144			45	2.519	1.824	0.13	5.975	4.326	2.23	6.870	4.974	25.75	2.200	1.593	24.77
	Medium	10	3.587	0.577	0.04	6.283	1.011	0.49	4.004	0.644	3.40	1.041	0.168	2.49	40	2.433	1.566	0.11	5.826	3.749	1.93	6.476	4.168	21.57	2.087	1.343	20.89
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total	**10**		**0.577**	**0.04**		**1.011**	**0.49**		**0.644**	**3.40**		**0.168**	**2.49**	**85**		**3.390**	**0.24**		**8.076**	**4.17**		**9.143**	**47.32**		**2.936**	**45.66**
2028	Shallow		3.671			6.432			4.375			1.144			30	2.519	1.216	0.09	5.975	2.884	1.49	6.870	3.316	17.16	2.200	1.062	16.51
	Medium	10	3.587	0.577	0.04	6.283	1.011	0.49	4.004	0.644	3.40	1.041	0.168	2.49	40	2.433	1.566	0.11	5.826	3.749	1.93	6.476	4.168	21.57	2.087	1.343	20.89
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total	**10**		**0.577**	**0.04**		**1.011**	**0.49**		**0.644**	**3.40**		**0.168**	**2.49**	**70**		**2.782**	**0.20**		**6.634**	**3.42**		**7.484**	**38.74**		**2.405**	**37.40**
2029	Shallow		3.671			6.432			4.375			1.144			30	2.519	1.216	0.09	5.975	2.884	1.49	6.870	3.316	17.16	2.200	1.062	16.51
	Medium	10	3.587	0.577	0.04	6.283	1.011	0.49	4.004	0.644	3.40	1.041	0.168	2.49	40	2.433	1.566	0.11	5.826	3.749	1.93	6.476	4.168	21.57	2.087	1.343	20.89
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total	**10**		**0.577**	**0.04**		**1.011**	**0.49**		**0.644**	**3.40**		**0.168**	**2.49**	**70**		**2.782**	**0.20**		**6.634**	**3.42**		**7.484**	**38.74**		**2.405**	**37.40**
2030	Shallow		3.671			6.432			4.375			1.144			20	2.519	0.811	0.06	5.975	1.923	0.99	6.870	2.211	11.44	2.200	0.708	11.01
	Medium	10	3.587	0.577	0.04	6.283	1.011	0.49	4.004	0.644	3.40	1.041	0.168	2.49	40	2.433	1.566	0.11	5.826	3.749	1.93	6.476	4.168	21.57	2.087	1.343	20.89
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total	**10**		**0.577**	**0.04**		**1.011**	**0.49**		**0.644**	**3.40**		**0.168**	**2.49**	**60**		**2.376**	**0.17**		**5.672**	**2.93**		**6.379**	**33.02**		**2.051**	**31.90**
2031	Shallow		3.671			6.432			4.375			1.144			20	2.519	0.811	0.06	5.975	1.923	0.99	6.870	2.211	11.44	2.200	0.708	11.01
	Medium	10	3.587	0.577	0.04	6.283	1.011	0.49	4.004	0.644	3.40	1.041	0.168	2.49	40	2.433	1.566	0.11	5.826	3.749	1.93	6.476	4.168	21.57	2.087	1.343	20.89
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total	**10**		**0.577**	**0.04**		**1.011**	**0.49**		**0.644**	**3.40**		**0.168**	**2.49**	**60**		**2.376**	**0.17**		**5.672**	**2.93**		**6.379**	**33.02**		**2.051**	**31.90**
2032	Shallow		3.671			6.432			4.375			1.144			20	2.519	0.811	0.06	5.975	1.923	0.99	6.870	2.211	11.44	2.200	0.708	11.01
	Medium	10	3.587	0.577	0.04	6.283	1.011	0.49	4.004	0.644	3.40	1.041	0.168	2.49	40	2.433	1.566	0.11	5.826	3.749	1.93	6.476	4.168	21.57	2.087	1.343	20.89
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total	**10**		**0.577**	**0.04**		**1.011**	**0.49**		**0.644**	**3.40**		**0.168**	**2.49**	**60**		**2.376**	**0.17**		**5.672**	**2.93**		**6.379**	**33.02**		**2.051**	**31.90**
2033	Shallow		3.671			6.432			4.375			1.144			20	2.519	0.811	0.06	5.975	1.923	0.99	6.870	2.211	11.44	2.200	0.708	11.01
	Medium	10	3.587	0.577	0.04	6.283	1.011	0.49	4.004	0.644	3.40	1.041	0.168	2.49	40	2.433	1.566	0.11	5.826	3.749	1.93	6.476	4.168	21.57	2.087	1.343	20.89
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total	**10**		**0.577**	**0.04**		**1.011**	**0.49**		**0.644**	**3.40**		**0.168**	**2.49**	**60**		**2.376**	**0.17**		**5.672**	**2.93**		**6.379**	**33.02**		**2.051**	**31.90**
2034	Shallow		3.671			6.432			4.375			1.144			20	2.519	0.811	0.06	5.975	1.923	0.99	6.870	2.211	11.44	2.200	0.708	11.01
	Medium	10	3.587	0.577	0.04	6.283	1.011	0.49	4.004	0.644	3.40	1.041	0.168	2.49	30	2.433	1.174	0.08	5.826	2.812	1.45	6.476	3.126	16.18	2.087	1.007	15.67
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total	**10**		**0.577**	**0.04**		**1.011**	**0.49**		**0.644**	**3.40**		**0.168**	**2.49**	**50**		**1.985**	**0.14**		**4.735**	**2.44**		**5.337**	**27.62**		**1.715**	**26.67**
2035	Shallow		3.671			6.432			4.375			1.144			20	2.519	0.811	0.06	5.975	1.923	0.99	6.870	2.211	11.44	2.200	0.708	11.01
	Medium	10	3.587	0.577	0.04	6.283	1.011	0.49	4.004	0.644	3.40	1.041	0.168	2.49	30	2.433	1.174	0.08	5.826	2.812	1.45	6.476	3.126	16.18	2.087	1.007	15.67
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total	**10**		**0.577**	**0.04**		**1.011**	**0.49**		**0.644**	**3.40**		**0.168**	**2.49**	**50**		**1.985**	**0.14**		**4.735**	**2.44**		**5.337**	**27.62**		**1.715**	**26.67**
2036	Shallow		3.671			6.432			4.375			1.144			15	2.519	0.608	0.04	5.975	1.442	0.74	6.870	1.658	8.58	2.200	0.531	8.26
	Medium	5	3.587	0.289	0.02	6.283	0.505	0.25	4.004	0.322	1.70	1.041	0.084	1.25	20	2.433	0.783	0.06	5.826	1.875	0.97	6.476	2.084	10.79	2.087	0.672	10.44
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total	**5**		**0.289**	**0.02**		**0.505**	**0.25**		**0.322**	**1.70**		**0.084**	**1.25**	**35**		**1.391**	**0.10**		**3.317**	**1.71**		**3.742**	**19.37**		**1.202**	**18.70**
2037	Shallow		3.671			6.432			4.375			1.144			15	2.519	0.608	0.04	5.975	1.442	0.74	6.870	1.658	8.58	2.200	0.531	8.26
	Medium	5	3.587	0.289	0.02	6.283	0.505	0.25	4.004	0.322	1.70	1.041	0.084	1.25	20	2.433	0.783	0.06	5.826	1.875	0.97	6.476	2.084	10.79	2.087	0.672	10.44
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total	**5**		**0.289**	**0.02**		**0.505**	**0.25**		**0.322**	**1.70**		**0.084**	**1.25**	**35**		**1.391**	**0.10**		**3.317**	**1.71**		**3.742**	**19.37**		**1.202**	**18.70**
2038	Shallow		3.671			6.432			4.375			1.144			15	2.519	0.608	0.04	5.975	1.442	0.74	6.870	1.658	8.58	2.200	0.531	8.26
	Medium	5	3.587	0.289	0.02	6.283	0.505	0.25	4.004	0.322	1.70	1.041	0.084	1.25	20	2.433	0.783	0.06	5.826	1.875	0.97	6.476	2.084	10.79	2.087	0.672	10.44
	Deep		3.243			5.676			2.636			0.659				2.087			5.218			5.086			1.695		
	Total	**5**		**0.289**	**0.02**		**0.505**	**0.25**		**0.322**	**1.70**		**0.084**	**1.25**	**35**		**1.391**	**0.10**		**3.317**	**1.71**		**3.742**	**19.37**		**1.202**	**18.70**

Table 4.4.2
Arctic Spill Occurrence - Sale All - P/L - Summary

Year	Production [MMbbl]	Small Spills 50-99 bbl			Medium Spills 100-999 bbl			Small and Medium Spills 50-999 bbl			Large Spills 1000-9999 bbl			Huge Spills =>10000 bbl			Significant Spills =>1000 bbl			All Spills		
		Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 103years	Frequency Spills per 109 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]
2004																						
2005																						
2006																						
2007																						
2008																						
2009																						
2010	**7.9**	0.405	0.051	0.029	0.961	0.122	0.496	1.367	0.173	0.525	1.105	0.140	5.721	0.354	0.045	5.504	1.459	0.185	11.226	2.826	0.358	11.751
2011	**15.7**	0.405	0.026	0.029	0.961	0.061	0.496	1.367	0.087	0.525	1.105	0.070	5.721	0.354	0.023	5.504	1.459	0.093	11.226	2.826	0.180	11.751
2012	**23.6**	0.811	0.034	0.058	1.923	0.081	0.992	2.734	0.116	1.050	2.211	0.094	11.443	0.708	0.030	11.009	2.919	0.124	22.451	5.652	0.240	23.501
2013	**39.4**	1.216	0.031	0.087	2.884	0.073	1.488	4.100	0.104	1.575	3.316	0.084	17.164	1.062	0.027	16.513	4.378	0.111	33.677	8.478	0.215	35.252
2014	**44.4**	1.216	0.027	0.087	2.884	0.065	1.488	4.100	0.092	1.575	3.316	0.075	17.164	1.062	0.024	16.513	4.378	0.099	33.677	8.478	0.191	35.252
2015	**55.3**	2.013	0.036	0.143	4.783	0.086	2.468	6.796	0.123	2.611	5.464	0.099	28.279	1.752	0.032	27.240	7.215	0.130	55.518	14.011	0.253	58.129
2016	**59.5**	2.013	0.034	0.143	4.783	0.080	2.468	6.796	0.114	2.611	5.464	0.092	28.279	1.752	0.029	27.240	7.215	0.121	55.518	14.011	0.235	58.129
2017	**74.5**	3.294	0.044	0.234	7.656	0.103	3.934	10.950	0.147	4.169	8.454	0.113	43.790	2.693	0.036	41.823	11.147	0.150	85.614	22.097	0.297	89.783
2018	**76.1**	3.294	0.043	0.234	7.656	0.101	3.934	10.950	0.144	4.169	8.454	0.111	43.790	2.693	0.035	41.823	11.147	0.146	85.614	22.097	0.290	89.783
2019	**102.5**	4.778	0.047	0.340	11.010	0.107	5.649	15.787	0.154	5.989	11.998	0.117	62.163	3.811	0.037	59.160	15.809	0.154	121.322	31.596	0.308	127.311
2020	**103.5**	4.778	0.046	0.340	11.010	0.106	5.649	15.787	0.153	5.989	11.998	0.116	62.163	3.811	0.037	59.160	15.809	0.153	121.322	31.596	0.305	127.311
2021	**97.9**	4.778	0.049	0.340	11.010	0.112	5.649	15.787	0.161	5.989	11.998	0.123	62.163	3.811	0.039	59.160	15.809	0.161	121.322	31.596	0.323	127.311
2022	**93.1**	4.778	0.051	0.340	11.010	0.118	5.649	15.787	0.170	5.989	11.998	0.129	62.163	3.811	0.041	59.160	15.809	0.170	121.322	31.596	0.339	127.311
2023	**85.6**	4.778	0.056	0.340	11.010	0.129	5.649	15.787	0.184	5.989	11.998	0.140	62.163	3.811	0.045	59.160	15.809	0.185	121.322	31.596	0.369	127.311
2024	**79.2**	4.778	0.060	0.340	11.010	0.139	5.649	15.787	0.199	5.989	11.998	0.151	62.163	3.811	0.048	59.160	15.809	0.200	121.322	31.596	0.399	127.311
2025	**67.5**	4.372	0.065	0.311	10.048	0.149	5.153	14.421	0.214	5.464	10.892	0.161	56.441	3.457	0.051	53.655	14.349	0.213	110.096	28.770	0.426	115.561
2026	**59.0**	4.372	0.074	0.311	10.048	0.170	5.153	14.421	0.244	5.464	10.892	0.185	56.441	3.457	0.059	53.655	14.349	0.243	110.096	28.770	0.488	115.561
2027	**49.9**	3.967	0.079	0.282	9.087	0.182	4.657	13.054	0.262	4.939	9.787	0.196	50.720	3.103	0.062	48.151	12.890	0.258	98.871	25.944	0.520	103.810
2028	**42.2**	3.359	0.080	0.239	7.645	0.181	3.913	11.004	0.261	4.152	8.129	0.193	42.138	2.572	0.061	39.894	10.701	0.254	82.032	21.705	0.514	86.184
2029	**37.0**	3.359	0.091	0.239	7.645	0.207	3.913	11.004	0.297	4.152	8.129	0.220	42.138	2.572	0.070	39.894	10.701	0.289	82.032	21.705	0.587	86.184
2030	**32.4**	2.954	0.091	0.210	6.683	0.206	3.417	9.637	0.297	3.627	7.023	0.217	36.416	2.219	0.068	34.390	9.242	0.285	70.806	18.879	0.583	74.433
2031	**28.5**	2.954	0.104	0.169	6.683	0.235	2.927	9.637	0.338	3.096	7.023	0.246	33.016	2.219	0.078	31.897	9.242	0.324	64.912	18.879	0.662	68.008
2032	**25.0**	2.954	0.118	0.210	6.683	0.267	3.417	9.637	0.385	3.627	7.023	0.281	36.416	2.219	0.089	34.390	9.242	0.370	70.806	18.879	0.755	74.433
2033	**21.9**	2.954	0.135	0.210	6.683	0.305	3.417	9.637	0.440	3.627	7.023	0.321	36.416	2.219	0.101	34.390	9.242	0.422	70.806	18.879	0.862	74.433
2034	**17.0**	2.562	0.151	0.182	5.746	0.338	2.933	8.308	0.489	3.116	5.981	0.352	31.023	1.883	0.111	29.168	7.86	0.46	60.19	16.172	0.951	63.307
2035	**14.9**	2.562	0.172	0.182	5.746	0.386	2.933	8.308	0.558	3.116	5.981	0.401	31.023	1.883	0.126	29.168	7.86	0.53	60.19	16.172	1.085	63.307
2036	**8.3**	1.679	0.202	0.120	3.822	0.461	1.956	5.502	0.663	2.076	4.064	0.490	21.069	1.286	0.155	19.947	5.35	0.64	41.02	10.852	1.308	43.092
2037	**7.3**	1.679	0.230	0.120	3.822	0.524	1.956	5.502	0.754	2.076	4.064	0.557	21.069	1.286	0.176	19.947	5.35	0.73	41.02	10.852	1.487	43.092
2038	**6.5**	1.679	0.258	0.120	3.822	0.588	1.956	5.502	0.846	2.076	4.064	0.625	21.069	1.286	0.198	19.947	5.35	0.82	41.02	10.852	1.670	43.092
Total LOF	**1375.6**	**84.737**		**6**	**194.717**		**99**	**279.454**		**105**	**210.952**		**1090**	**66.957**		**1037**	**277.909**		**2126**	**557.363**		**2232**
Average LOF		**2.421**	**0.062**	**0**	**5.563**	**0.142**	**3**	**7.984**	**0.203**	**3**	**6.027**	**0.153**	**31**	**1.913**	**0.049**	**30**	**7.940**	**0.202**	**61**	**15.925**	**0.405**	**64**

Table 4.4.3
Arctic Spill Occurrence - Sale All - Platforms

Year	Water Depth	N Platforms	N P Wells	Small and Medium Spills 50-999 bbl			Large and Huge Spills =>1000 bbl		
				Expected Spill [bbl] =		452	Expected Spill [bbl] =		5631
		Cum.	Cum.	Frequency spills per 10^4well-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4well-year	Frequency spills per 10^3years	Spill Index bbl
2004	Shallow			1.619			0.274		
	Medium			1.704			0.288		
	Deep			1.828			0.309		
	Total								
2005	Shallow			1.619			0.274		
	Medium			1.704			0.288		
	Deep			1.828			0.309		
	Total								
2006	Shallow			1.619			0.274		
	Medium			1.704			0.288		
	Deep			1.828			0.309		
	Total								
2007	Shallow			1.619			0.274		
	Medium			1.704			0.288		
	Deep			1.828			0.309		
	Total								
2008	Shallow			1.619			0.274		
	Medium			1.704			0.288		
	Deep			1.828			0.309		
	Total								
2009	Shallow	1	3	1.619	0.486	0.22	0.274	0.082	0.46
	Medium			1.704			0.288		
	Deep			1.828			0.309		
	Total	**1**	**3**		**0.486**	**0.22**		**0.082**	**0.46**
2010	Shallow	1	13	1.619	2.105	0.95	0.274	0.357	2.01
	Medium			1.704			0.288		
	Deep			1.828			0.309		
	Total	**1**	**13**		**2.105**	**0.95**		**0.357**	**2.01**
2011	Shallow	2	26	1.619	4.210	1.90	0.274	0.713	4.02
	Medium			1.704			0.288		
	Deep			1.828			0.309		
	Total	**2**	**26**		**4.210**	**1.90**		**0.713**	**4.02**
2012	Shallow	3	39	1.619	6.315	2.85	0.274	1.070	6.02
	Medium			1.704			0.288		
	Deep			1.828			0.309		
	Total	**3**	**39**		**6.315**	**2.85**		**1.070**	**6.02**
2013	Shallow	3	59	1.619	9.553	4.32	0.274	1.618	9.11
	Medium			1.704			0.288		
	Deep			1.828			0.309		
	Total	**3**	**59**		**9.553**	**4.32**		**1.618**	**9.11**
2014	Shallow	3	69	1.619	11.172	5.05	0.274	1.893	10.66
	Medium	1	3	1.704	0.511	0.23	0.288	0.087	0.49
	Deep			1.828			0.309		
	Total	**4**	**72**		**11.683**	**5.28**		**1.979**	**11.14**
2015	Shallow	3	69	1.619	11.172	5.05	0.274	1.893	10.66
	Medium	1	13	1.704	2.215	1.00	0.288	0.375	2.11
	Deep			1.828			0.309		
	Total	**4**	**82**		**13.387**	**6.05**		**2.268**	**12.77**
2016	Shallow	3	69	1.619	11.172	5.05	0.274	1.893	10.66
	Medium	2	26	1.704	4.430	2.00	0.288	0.750	4.22
	Deep			1.828			0.309		
	Total	**5**	**95**		**15.602**	**7.05**		**2.642**	**14.88**
2017	Shallow	3	69	1.619	11.172	5.05	0.274	1.893	10.66
	Medium	3	39	1.704	6.644	3.00	0.288	1.125	6.33
	Deep			1.828			0.309		
	Total	**6**	**108**		**17.816**	**8.05**		**3.017**	**16.99**
2018	Shallow	3	69	1.619	11.172	5.05	0.274	1.893	10.66
	Medium	4	63	1.704	10.733	4.85	0.288	1.817	10.23
	Deep			1.828			0.309		
	Total	**7**	**132**		**21.905**	**9.90**		**3.709**	**20.89**
2019	Shallow	3	69	1.619	11.172	5.05	0.274	1.893	10.66
	Medium	5	87	1.704	14.822	6.70	0.288	2.509	14.13
	Deep			1.828			0.309		
	Total	**8**	**156**		**25.994**	**11.75**		**4.401**	**24.78**
2020	Shallow	3	69	1.619	11.172	5.05	0.274	1.893	10.66
	Medium	5	107	1.704	18.229	8.24	0.288	3.085	17.37
	Deep			1.828			0.309		
	Total	**8**	**176**		**29.401**	**13.29**		**4.978**	**28.03**
2021	Shallow	3	69	1.619	11.172	5.05	0.274	1.893	10.66
	Medium	5	127	1.704	21.637	9.78	0.288	3.662	20.62
	Deep			1.828			0.309		
	Total	**8**	**196**		**32.809**	**14.83**		**5.555**	**31.28**
2022	Shallow	3	69	1.619	11.172	5.05	0.274	1.893	10.66
	Medium	5	137	1.704	23.340	10.55	0.288	3.950	22.24
	Deep			1.828			0.309		
	Total	**8**	**206**		**34.512**	**15.60**		**5.843**	**32.90**
2023	Shallow	3	69	1.619	11.172	5.05	0.274	1.893	10.66
	Medium	5	137	1.704	23.340	10.55	0.288	3.950	22.24
	Deep			1.828			0.309		
	Total	**8**	**206**		**34.512**	**15.60**		**5.843**	**32.90**
2024	Shallow	3	69	1.619	11.172	5.05	0.274	1.893	10.66
	Medium	5	137	1.704	23.340	10.55	0.288	3.950	22.24

Table 4.4.3
Arctic Spill Occurrence - Sale All - Platforms

Year	Water Depth	N Platforms	N P Wells	Small and Medium Spills 50-999 bbl			Large and Huge Spills =>1000 bbl		
				Expected Spill [bbl] =		**452**	Expected Spill [bbl] =		**5631**
		Cum.	Cum.	Frequency spills per 10^4well-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4well-year	Frequency spills per 10^3years	Spill Index bbl
2024	Deep			1.828			0.309		
	Total	**8**	**206**		**34.512**	**15.60**		**5.843**	**32.90**
2025	Shallow	2	46	1.619	7.448	3.37	0.274	1.262	7.11
	Medium	5	137	1.704	23.340	10.55	0.288	3.950	22.24
	Deep			1.828			0.309		
	Total	**7**	**183**		**30.788**	**13.91**		**5.212**	**29.35**
2026	Shallow	2	46	1.619	7.448	3.37	0.274	1.262	7.11
	Medium	5	137	1.704	23.340	10.55	0.288	3.950	22.24
	Deep			1.828			0.309		
	Total	**7**	**183**		**30.788**	**13.91**		**5.212**	**29.35**
2027	Shallow	1	23	1.619	3.724	1.68	0.274	0.631	3.55
	Medium	5	137	1.704	23.340	10.55	0.288	3.950	22.24
	Deep			1.828			0.309		
	Total	**6**	**160**		**27.064**	**12.23**		**4.581**	**25.80**
2028	Shallow			1.619			0.274		
	Medium	5	137	1.704	23.340	10.55	0.288	3.950	22.24
	Deep			1.828			0.309		
	Total	**5**	**137**		**23.340**	**10.55**		**3.950**	**22.24**
2029	Shallow			1.619			0.274		
	Medium	5	137	1.704	23.340	10.55	0.288	3.950	22.24
	Deep			1.828			0.309		
	Total	**5**	**137**		**23.340**	**10.55**		**3.950**	**22.24**
2030	Shallow			1.619			0.274		
	Medium	5	137	1.704	23.340	10.55	0.288	3.950	22.24
	Deep			1.828			0.309		
	Total	**5**	**137**		**23.340**	**10.55**		**3.950**	**22.24**
2031	Shallow			1.619			0.274		
	Medium	5	137	1.704	23.340	10.55	0.288	3.950	22.24
	Deep			1.828			0.309		
	Total	**5**	**137**		**23.340**	**10.55**		**3.950**	**22.24**
2032	Shallow			1.619			0.274		
	Medium	5	137	1.704	23.340	10.55	0.288	3.950	22.24
	Deep			1.828			0.309		
	Total	**5**	**137**		**23.340**	**10.55**		**3.950**	**22.24**
2033	Shallow			1.619			0.274		
	Medium	5	137	1.704	23.340	10.55	0.288	3.950	22.24
	Deep			1.828			0.309		
	Total	**5**	**137**		**23.340**	**10.55**		**3.950**	**22.24**
2034	Shallow			1.619			0.274		
	Medium	4	114	1.704	19.422	8.78	0.288	3.287	18.51
	Deep			1.828			0.309		
	Total	**4**	**114**		**19.422**	**8.78**		**3.287**	**18.51**
2035	Shallow			1.619			0.274		
	Medium	4	114	1.704	19.422	8.78	0.288	3.287	18.51
	Deep			1.828			0.309		
	Total	**4**	**114**		**19.422**	**8.78**		**3.287**	**18.51**
2036	Shallow			1.619			0.274		
	Medium	2	68	1.704	11.585	5.24	0.288	1.961	11.04
	Deep			1.828			0.309		
	Total	**2**	**68**		**11.585**	**5.24**		**1.961**	**11.04**
2037	Shallow			1.619			0.274		
	Medium	2	68	1.704	11.585	5.24	0.288	1.961	11.04
	Deep			1.828			0.309		
	Total	**2**	**68**		**11.585**	**5.24**		**1.961**	**11.04**
2038	Shallow			1.619			0.274		
	Medium	2	68	1.704	11.585	5.24	0.288	1.961	11.04
	Deep			1.828			0.309		
	Total	**2**	**68**		**11.585**	**5.24**		**1.961**	**11.04**

Table 4.4.4
Arctic Spill Occurrence - Sale All - Platforms - Summary

Year	Production [MMbbl]	Small and Medium Spills 50-999 bbl			Large and Huge Spills =>1000 bbl			Significant Spills =>1000 bbl			All Spills		
		Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 103years	Frequency Spills per 109 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]
2004													
2005													
2006													
2007													
2008													
2009		0.486		0.220	0.082		0.463	0.082		0.463	0.568		0.683
2010	**7.9**	2.105	0.266	0.951	0.357	0.045	2.008	0.357	0.045	2.008	2.461	0.312	2.959
2011	**15.7**	4.210	0.268	1.902	0.713	0.045	4.016	0.713	0.045	4.016	4.923	0.314	5.918
2012	**23.6**	6.315	0.268	2.854	1.070	0.045	6.024	1.070	0.045	6.024	7.384	0.313	8.878
2013	**39.4**	9.553	0.242	4.317	1.618	0.041	9.113	1.618	0.041	9.113	11.171	0.284	13.430
2014	**44.4**	11.683	0.263	5.280	1.979	0.045	11.145	1.979	0.045	11.145	13.662	0.308	16.424
2015	**55.3**	13.387	0.242	6.050	2.268	0.041	12.768	2.268	0.041	12.768	15.654	0.283	18.818
2016	**59.5**	15.602	0.262	7.051	2.642	0.044	14.879	2.642	0.044	14.879	18.244	0.307	21.930
2017	**74.5**	17.816	0.239	8.052	3.017	0.040	16.990	3.017	0.040	16.990	20.833	0.280	25.041
2018	**76.1**	21.905	0.288	9.899	3.709	0.049	20.887	3.709	0.049	20.887	25.614	0.337	30.786
2019	**102.5**	25.994	0.254	11.747	4.401	0.043	24.783	4.401	0.043	24.783	30.395	0.297	36.530
2020	**103.5**	29.401	0.284	13.287	4.978	0.048	28.031	4.978	0.048	28.031	34.379	0.332	41.318
2021	**97.9**	32.809	0.335	14.827	5.555	0.057	31.278	5.555	0.057	31.278	38.363	0.392	46.105
2022	**93.1**	34.512	0.371	15.597	5.843	0.063	32.902	5.843	0.063	32.902	40.355	0.433	48.498
2023	**85.6**	34.512	0.403	15.597	5.843	0.068	32.902	5.843	0.068	32.902	40.355	0.471	48.498
2024	**79.2**	34.512	0.436	15.597	5.843	0.074	32.902	5.843	0.074	32.902	40.355	0.510	48.498
2025	**67.5**	30.788	0.456	13.914	5.212	0.077	29.349	5.212	0.077	29.349	36.000	0.533	43.263
2026	**59.0**	30.788	0.522	13.914	5.212	0.088	29.349	5.212	0.088	29.349	36.000	0.610	43.263
2027	**49.9**	27.064	0.542	12.231	4.581	0.092	25.796	4.581	0.092	25.796	31.645	0.634	38.027
2028	**42.2**	23.340	0.553	10.548	3.950	0.094	22.244	3.950	0.094	22.244	27.290	0.647	32.792
2029	**37.0**	23.340	0.631	10.548	3.950	0.107	22.244	3.950	0.107	22.244	27.290	0.738	32.792
2030	**32.4**	23.340	0.720	10.548	3.950	0.122	22.244	3.950	0.122	22.244	27.290	0.842	32.792
2031	**28.5**	23.340	0.819	10.548	3.950	0.139	22.244	3.950	0.139	22.244	27.290	0.958	32.792
2032	**25.0**	23.340	0.934	10.548	3.950	0.158	22.244	3.950	0.158	22.244	27.290	1.092	32.792
2033	**21.9**	23.340	1.066	10.548	3.950	0.180	22.244	3.950	0.180	22.244	27.290	1.246	32.792
2034	**17.0**	19.422	1.142	8.777	3.287	0.193	18.510	22.71	1.34	27.29	22.709	1.336	27.287
2035	**14.9**	19.422	1.303	8.777	3.287	0.221	18.510	22.71	1.52	27.29	22.709	1.524	27.287
2036	**8.3**	11.585	1.396	5.235	1.961	0.236	11.041	13.55	1.63	16.28	13.546	1.632	16.276
2037	**7.3**	11.585	1.587	5.235	1.961	0.269	11.041	13.55	1.86	16.28	13.546	1.856	16.276
2038	**6.5**	11.585	1.782	5.235	1.961	0.302	11.041	13.55	2.08	16.28	13.546	2.084	16.276
Total LOF	**1375.6**	**597.080**		**270**	**101.082**		**569**	**174.680**		**602**	**698.162**		**839**
Average LOF		**17.059**	**0.434**	**8**	**2.888**	**0.073**	**16**	**4.991**	**0.127**	**17**	**19.947**	**0.508**	**24**

Table 4.4.5
Arctic Spill Occurrence - Sale All - Production Wells

Year	Water Depth	Production Wells Blowout												
		N Wells	Small and Medium Spills 50-999 bbl			Large Spills 1000-9999 bbl			Spills 10000-149999 bbl			Spills =>150000 bbl		
			Expected Spill [bbl] =		519	Expected Spill [bbl] =		5292	Expected Spill [bbl] =		68349	Expected Spill [bbl] =		200000
		Cum.	Frequency spills per 10^4well-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4well-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4well-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4well-year	Frequency spills per 10^3years	Spill Index bbl
2004	Shallow		0.103			0.718			0.308			0.205		
	Medium		0.103			0.718			0.308			0.205		
	Deep		0.103			0.718			0.308			0.205		
	Total													
2005	Shallow		0.103			0.718			0.308			0.205		
	Medium		0.103			0.718			0.308			0.205		
	Deep		0.103			0.718			0.308			0.205		
	Total													
2006	Shallow		0.103			0.718			0.308			0.205		
	Medium		0.103			0.718			0.308			0.205		
	Deep		0.103			0.718			0.308			0.205		
	Total													
2007	Shallow		0.103			0.718			0.308			0.205		
	Medium		0.103			0.718			0.308			0.205		
	Deep		0.103			0.718			0.308			0.205		
	Total													
2008	Shallow		0.103			0.718			0.308			0.205		
	Medium		0.103			0.718			0.308			0.205		
	Deep		0.103			0.718			0.308			0.205		
	Total													
2009	Shallow	3	0.103	0.031	0.02	0.718	0.215	1.14	0.308	0.092	6.31	0.205	0.062	12.31
	Medium		0.103			0.718			0.308			0.205		
	Deep		0.103			0.718			0.308			0.205		
	Total	**3**		0.031	**0.02**		0.215	**1.14**		0.092	**6.31**		0.062	**12.31**
2010	Shallow	13	0.103	0.133	0.07	0.718	0.934	4.94	0.308	0.400	27.35	0.205	0.267	53.36
	Medium		0.103			0.718			0.308			0.205		
	Deep		0.103			0.718			0.308			0.205		
	Total	**13**		0.133	**0.07**		0.934	**4.94**		0.400	**27.35**		0.267	**53.36**
2011	Shallow	26	0.103	0.267	0.14	0.718	1.868	9.88	0.308	0.800	54.71	0.205	0.534	106.72
	Medium		0.103			0.718			0.308			0.205		
	Deep		0.103			0.718			0.308			0.205		
	Total	**26**		0.267	**0.14**		1.868	**9.88**		0.800	**54.71**		0.534	**106.72**
2012	Shallow	39	0.103	0.400	0.21	0.718	2.801	14.83	0.308	1.201	82.06	0.205	0.800	160.08
	Medium		0.103			0.718			0.308			0.205		
	Deep		0.103			0.718			0.308			0.205		
	Total	**39**		0.400	**0.21**		2.801	**14.83**		1.201	**82.06**		0.800	**160.08**
2013	Shallow	59	0.103	0.605	0.31	0.718	4.238	22.43	0.308	1.816	124.14	0.205	1.211	242.17
	Medium		0.103			0.718			0.308			0.205		
	Deep		0.103			0.718			0.308			0.205		
	Total	**59**		0.605	**0.31**		4.238	**22.43**		1.816	**124.14**		1.211	**242.17**
2014	Shallow	69	0.103	0.708	0.37	0.718	4.956	26.23	0.308	2.124	145.18	0.205	1.416	283.21
	Medium	3	0.103	0.031	0.02	0.718	0.215	1.14	0.308	0.092	6.31	0.205	0.062	12.31
	Deep		0.103			0.718			0.308			0.205		
	Total	**72**		0.739	**0.38**		5.172	**27.37**		2.216	**151.49**		1.478	**295.53**
2015	Shallow	69	0.103	0.708	0.37	0.718	4.956	26.23	0.308	2.124	145.18	0.205	1.416	283.21
	Medium	13	0.103	0.133	0.07	0.718	0.934	4.94	0.308	0.400	27.35	0.205	0.267	53.36
	Deep		0.103			0.718			0.308			0.205		
	Total	**82**		0.841	**0.44**		5.890	**31.17**		2.524	**172.53**		1.683	**336.57**
2016	Shallow	69	0.103	0.708	0.37	0.718	4.956	26.23	0.308	2.124	145.18	0.205	1.416	283.21
	Medium	26	0.103	0.267	0.14	0.718	1.868	9.88	0.308	0.800	54.71	0.205	0.534	106.72
	Deep		0.103			0.718			0.308			0.205		
	Total	**95**		0.975	**0.51**		6.824	**36.11**		2.924	**199.88**		1.950	**389.93**
2017	Shallow	69	0.103	0.708	0.37	0.718	4.956	26.23	0.308	2.124	145.18	0.205	1.416	283.21
	Medium	39	0.103	0.400	0.21	0.718	2.801	14.83	0.308	1.201	82.06	0.205	0.800	160.08
	Deep		0.103			0.718			0.308			0.205		
	Total	**108**		1.108	**0.58**		7.758	**41.05**		3.325	**227.24**		2.216	**443.29**
2018	Shallow	69	0.103	0.708	0.37	0.718	4.956	26.23	0.308	2.124	145.18	0.205	1.416	283.21
	Medium	63	0.103	0.646	0.34	0.718	4.525	23.95	0.308	1.939	132.55	0.205	1.293	258.59
	Deep		0.103			0.718			0.308			0.205		
	Total	**132**		1.354	**0.70**		9.481	**50.18**		4.063	**277.73**		2.709	**541.80**
2019	Shallow	69	0.103	0.708	0.37	0.718	4.956	26.23	0.308	2.124	145.18	0.205	1.416	283.21
	Medium	87	0.103	0.893	0.46	0.718	6.249	33.07	0.308	2.678	183.05	0.205	1.785	357.10
	Deep		0.103			0.718			0.308			0.205		
	Total	**156**		1.601	**0.83**		11.205	**59.30**		4.802	**328.23**		3.202	**640.31**
2020	Shallow	69	0.103	0.708	0.37	0.718	4.956	26.23	0.308	2.124	145.18	0.205	1.416	283.21
	Medium	107	0.103	1.098	0.57	0.718	7.686	40.67	0.308	3.294	225.13	0.205	2.196	439.19
	Deep		0.103			0.718			0.308			0.205		
	Total	**176**		1.806	**0.94**		12.642	**66.90**		5.418	**370.31**		3.612	**722.40**
2021	Shallow	69	0.103	0.708	0.37	0.718	4.956	26.23	0.308	2.124	145.18	0.205	1.416	283.21
	Medium	127	0.103	1.303	0.68	0.718	9.122	48.28	0.308	3.910	267.21	0.205	2.606	521.28
	Deep		0.103			0.718			0.308			0.205		
	Total	**196**		2.011	**1.04**		14.079	**74.51**		6.034	**412.39**		4.022	**804.49**

Table 4.4.5
Arctic Spill Occurrence - Sale All - Production Wells

Year	Water Depth	Production Wells Blowout												
		N Wells	Small and Medium Spills 50-999 bbl			Large Spills 1000-9999 bbl			Spills 10000-149999 bbl			Spills =>150000 bbl		
			Expected Spill [bbl] =		519	Expected Spill [bbl] =		5292	Expected Spill [bbl] =		68349	Expected Spill [bbl] =		200000
		Cum.	Frequency spills per 10^4well-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4well-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4well-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4well-year	Frequency spills per 10^3years	Spill Index bbl
2022	Shallow	69	0.103	0.708	0.37	0.718	4.956	26.23	0.308	2.124	145.18	0.205	1.416	283.21
	Medium	137	0.103	1.406	0.73	0.718	9.841	52.08	0.308	4.217	288.25	0.205	2.812	562.32
	Deep		0.103			0.718			0.308			0.205		
	Total	**206**		2.114	**1.10**		14.797	**78.31**		6.342	**433.43**		4.228	**845.54**
2023	Shallow	69	0.103	0.708	0.37	0.718	4.956	26.23	0.308	2.124	145.18	0.205	1.416	283.21
	Medium	137	0.103	1.406	0.73	0.718	9.841	52.08	0.308	4.217	288.25	0.205	2.812	562.32
	Deep		0.103			0.718			0.308			0.205		
	Total	**206**		2.114	**1.10**		14.797	**78.31**		6.342	**433.43**		4.228	**845.54**
2024	Shallow	69	0.103	0.708	0.37	0.718	4.956	26.23	0.308	2.124	145.18	0.205	1.416	283.21
	Medium	137	0.103	1.406	0.73	0.718	9.841	52.08	0.308	4.217	288.25	0.205	2.812	562.32
	Deep		0.103			0.718			0.308			0.205		
	Total	**206**		2.114	**1.10**		14.797	**78.31**		6.342	**433.43**		4.228	**845.54**
2025	Shallow	46	0.103	0.472	0.25	0.718	3.304	17.49	0.308	1.416	96.79	0.205	0.944	188.81
	Medium	137	0.103	1.406	0.73	0.718	9.841	52.08	0.308	4.217	288.25	0.205	2.812	562.32
	Deep		0.103			0.718			0.308			0.205		
	Total	**183**		1.878	**0.98**		13.145	**69.56**		5.633	**385.04**		3.756	**751.13**
2026	Shallow	46	0.103	0.472	0.25	0.718	3.304	17.49	0.308	1.416	96.79	0.205	0.944	188.81
	Medium	137	0.103	1.406	0.73	0.718	9.841	52.08	0.308	4.217	288.25	0.205	2.812	562.32
	Deep		0.103			0.718			0.308			0.205		
	Total	**183**		1.878	**0.98**		13.145	**69.56**		5.633	**385.04**		3.756	**751.13**
2027	Shallow	23	0.103	0.236	0.12	0.718	1.652	8.74	0.308	0.708	48.39	0.205	0.472	94.40
	Medium	137	0.103	1.406	0.73	0.718	9.841	52.08	0.308	4.217	288.25	0.205	2.812	562.32
	Deep		0.103			0.718			0.308			0.205		
	Total	**160**		1.642	**0.85**		11.493	**60.82**		4.925	**336.65**		3.284	**656.73**
2028	Shallow		0.103			0.718			0.308			0.205		
	Medium	137	0.103	1.406	0.73	0.718	9.841	52.08	0.308	4.217	288.25	0.205	2.812	562.32
	Deep		0.103			0.718			0.308			0.205		
	Total	**137**		1.406	**0.73**		9.841	**52.08**		4.217	**288.25**		2.812	**562.32**
2029	Shallow		0.103			0.718			0.308			0.205		
	Medium	137	0.103	1.406	0.73	0.718	9.841	52.08	0.308	4.217	288.25	0.205	2.812	562.32
	Deep		0.103			0.718			0.308			0.205		
	Total	**137**		1.406	**0.73**		9.841	**52.08**		4.217	**288.25**		2.812	**562.32**
2030	Shallow		0.103			0.718			0.308			0.205		
	Medium	137	0.103	1.406	0.73	0.718	9.841	52.08	0.308	4.217	288.25	0.205	2.812	562.32
	Deep		0.103			0.718			0.308			0.205		
	Total	**137**		1.406	**0.73**		9.841	**52.08**		4.217	**288.25**		2.812	**562.32**
2031	Shallow		0.103			0.718			0.308			0.205		
	Medium	137	0.103	1.406	0.73	0.718	9.841	52.08	0.308	4.217	288.25	0.205	2.812	562.32
	Deep		0.103			0.718			0.308			0.205		
	Total	**137**		1.406	**0.73**		9.841	**52.08**		4.217	**288.25**		2.812	**562.32**
2032	Shallow		0.103			0.718			0.308			0.205		
	Medium	137	0.103	1.406	0.73	0.718	9.841	52.08	0.308	4.217	288.25	0.205	2.812	562.32
	Deep		0.103			0.718			0.308			0.205		
	Total	**137**		1.406	**0.73**		9.841	**52.08**		4.217	**288.25**		2.812	**562.32**
2033	Shallow		0.103			0.718			0.308			0.205		
	Medium	137	0.103	1.406	0.73	0.718	9.841	52.08	0.308	4.217	288.25	0.205	2.812	562.32
	Deep		0.103			0.718			0.308			0.205		
	Total	**137**		1.406	**0.73**		9.841	**52.08**		4.217	**288.25**		2.812	**562.32**
2034	Shallow		0.103			0.718			0.308			0.205		
	Medium	114	0.103	1.170	0.61	0.718	8.189	43.33	0.308	3.509	239.86	0.205	2.340	467.92
	Deep		0.103			0.718			0.308			0.205		
	Total	**114**		1.170	**0.61**		8.189	**43.33**		3.509	**239.86**		2.340	**467.92**
2035	Shallow		0.103			0.718			0.308			0.205		
	Medium	114	0.103	1.170	0.61	0.718	8.189	43.33	0.308	3.509	239.86	0.205	2.340	467.92
	Deep		0.103			0.718			0.308			0.205		
	Total	**114**		1.170	**0.61**		8.189	**43.33**		3.509	**239.86**		2.340	**467.92**
2036	Shallow		0.103			0.718			0.308			0.205		
	Medium	68	0.103	0.698	0.36	0.718	4.884	25.85	0.308	2.093	143.08	0.205	1.396	279.11
	Deep		0.103			0.718			0.308			0.205		
	Total	**68**		0.698	**0.36**		4.884	**25.85**		2.093	**143.08**		1.396	**279.11**
2037	Shallow		0.103			0.718			0.308			0.205		
	Medium	68	0.103	0.698	0.36	0.718	4.884	25.85	0.308	2.093	143.08	0.205	1.396	279.11
	Deep		0.103			0.718			0.308			0.205		
	Total	**68**		0.698	**0.36**		4.884	**25.85**		2.093	**143.08**		1.396	**279.11**
2038	Shallow		0.103			0.718			0.308			0.205		
	Medium	68	0.103	0.698	0.36	0.718	4.884	25.85	0.308	2.093	143.08	0.205	1.396	279.11
	Deep		0.103			0.718			0.308			0.205		
	Total	**68**		0.698	**0.36**		4.884	**25.85**		2.093	**143.08**		1.396	**279.11**

Table 4.4.6
Arctic Spill Occurrence - Sale All - Production Wells - Summary

Year	Production [MMbbl]	Small and Medium Spills 50-99 bbl			Large Spills 1000-9999 bbl			Huge Spills =>10000 bbl			All Spills		
		Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]
2004													
2005													
2006													
2007													
2008													
2009		0.031		0.016	0.092		1.140	0.154		18.626	0.277		19.782
2010	**7.9**	0.133	0.017	0.069	0.400	0.051	4.942	0.667	0.084	80.712	1.201	0.152	85.723
2011	**15.7**	0.267	0.017	0.139	0.800	0.051	9.883	1.334	0.085	161.423	2.401	0.153	171.445
2012	**23.6**	0.400	0.017	0.208	1.201	0.051	14.825	2.001	0.085	242.135	3.602	0.153	257.168
2013	**39.4**	0.605	0.015	0.314	1.816	0.046	22.428	3.027	0.077	366.307	5.449	0.138	389.049
2014	**44.4**	0.739	0.017	0.384	2.216	0.050	27.369	3.694	0.083	447.018	6.649	0.150	474.771
2015	**55.3**	0.841	0.015	0.437	2.524	0.046	31.171	4.207	0.076	509.104	7.573	0.137	540.712
2016	**59.5**	0.975	0.016	0.506	2.924	0.049	36.112	4.874	0.082	589.816	8.773	0.147	626.434
2017	**74.5**	1.108	0.015	0.576	3.325	0.045	41.054	5.541	0.074	670.527	9.974	0.134	712.157
2018	**76.1**	1.354	0.018	0.704	4.063	0.053	50.177	6.772	0.089	819.533	12.190	0.160	870.414
2019	**102.5**	1.601	0.016	0.831	4.802	0.047	59.300	8.004	0.078	968.539	14.407	0.141	#######
2020	**103.5**	1.806	0.017	0.938	5.418	0.052	66.903	9.030	0.087	#######	16.254	0.157	#######
2021	**97.9**	2.011	0.021	1.045	6.034	0.062	74.505	10.056	0.103	#######	18.101	0.185	#######
2022	**93.1**	2.114	0.023	1.098	6.342	0.068	78.306	10.569	0.114	#######	19.025	0.204	#######
2023	**85.6**	2.114	0.025	1.098	6.342	0.074	78.306	10.569	0.123	#######	19.025	0.222	#######
2024	**79.2**	2.114	0.027	1.098	6.342	0.080	78.306	10.569	0.133	#######	19.025	0.240	#######
2025	**67.5**	1.878	0.028	0.975	5.633	0.083	69.563	9.389	0.139	#######	16.900	0.250	#######
2026	**59.0**	1.878	0.032	0.975	5.633	0.095	69.563	9.389	0.159	#######	16.900	0.286	#######
2027	**49.9**	1.642	0.033	0.853	4.925	0.099	60.821	8.209	0.165	993.374	14.776	0.296	#######
2028	**42.2**	1.406	0.033	0.730	4.217	0.100	52.078	7.029	0.167	850.576	12.652	0.300	903.384
2029	**37.0**	1.406	0.038	0.730	4.217	0.114	52.078	7.029	0.190	850.576	12.652	0.342	903.384
2030	**32.4**	1.406	0.043	0.730	4.217	0.130	52.078	7.029	0.217	850.576	12.652	0.391	903.384
2031	**28.5**	1.406	0.049	0.730	4.217	0.148	52.078	7.029	0.247	850.576	12.652	0.444	903.384
2032	**25.0**	1.406	0.056	0.730	4.217	0.169	52.078	7.029	0.281	850.576	12.652	0.506	903.384
2033	**21.9**	1.406	0.064	0.730	4.217	0.193	52.078	7.029	0.321	850.576	12.652	0.578	903.384
2034	**17.0**	1.170	0.069	0.608	3.509	0.206	43.335	5.849	0.344	707.779	10.528	0.619	751.721
2035	**14.9**	1.170	0.079	0.608	3.509	0.236	43.335	5.849	0.393	707.779	10.528	0.707	751.721
2036	**8.3**	0.698	0.084	0.362	2.093	0.252	25.849	3.489	0.420	422.184	6.280	0.757	448.395
2037	**7.3**	0.698	0.096	0.362	2.093	0.287	25.849	3.489	0.478	422.184	6.280	0.860	448.395
2038	**6.5**	0.698	0.107	0.362	2.093	0.322	25.849	3.489	0.537	422.184	6.280	0.966	448.395

Table 4.4.7
Occurrence Spill Risks - Sale All - Exploration Wells

Year	Water Depth	Exploration Wells Blowout												
		N Wells	Small and Medium Spills 50-999 bbl			Large Spills 1000-9999 bbl			Spills 10000-149999 bbl			Spills =>150000 bbl		
			Expected Spill [bbl] =		519	Expected Spill [bbl] =		5292	Expected Spill [bbl] =		68349	Expected Spill [bbl] =		200000
		Cum.	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl
2004	Shallow	1	1.583	0.158	0.08	11.077	1.108	5.86	4.759	0.476	32.53	2.755	0.276	55.11
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total	**1**		0.158	**0.08**		1.108	**5.86**		0.476	**32.53**		0.276	**55.11**
2005	Shallow	1	1.583	0.158	0.08	11.077	1.108	5.86	4.759	0.476	32.53	2.755	0.276	55.11
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total	**1**		0.158	**0.08**		1.108	**5.86**		0.476	**32.53**		0.276	**55.11**
2006	Shallow	1	1.583	0.158	0.08	11.077	1.108	5.86	4.759	0.476	32.53	2.755	0.276	55.11
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total	**1**		0.158	**0.08**		1.108	**5.86**		0.476	**32.53**		0.276	**55.11**
2007	Shallow	2	1.583	0.317	0.16	11.077	2.215	11.72	4.759	0.952	65.06	2.755	0.551	110.22
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total	**2**		0.317	**0.16**		2.215	**11.72**		0.952	**65.06**		0.551	**110.22**
2008	Shallow	1	1.583	0.158	0.08	11.077	1.108	5.86	4.759	0.476	32.53	2.755	0.276	55.11
	Medium	1	1.809	0.181	0.09	12.659	1.266	6.70	5.439	0.544	37.18	3.149	0.315	62.98
	Deep		2.035			14.242			6.119			3.543		
	Total	**2**		0.339	**0.18**		2.374	**12.56**		1.020	**69.71**		0.590	**118.09**
2009	Shallow		1.583			11.077			4.759			2.755		
	Medium	1	1.809	0.181	0.09	12.659	1.266	6.70	5.439	0.544	37.18	3.149	0.315	62.98
	Deep		2.035			14.242			6.119			3.543		
	Total	**1**		0.181	**0.09**		1.266	**6.70**		0.544	**37.18**		0.315	**62.98**
2010	Shallow	1	1.583	0.158	0.08	11.077	1.108	5.86	4.759	0.476	32.53	2.755	0.276	55.11
	Medium	1	1.809	0.181	0.09	12.659	1.266	6.70	5.439	0.544	37.18	3.149	0.315	62.98
	Deep		2.035			14.242			6.119			3.543		
	Total	**2**		0.339	**0.18**		2.374	**12.56**		1.020	**69.71**		0.590	**118.09**
2011	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2012	Shallow		1.583			11.077			4.759			2.755		
	Medium	2	1.809	0.362	0.19	12.659	2.532	13.40	5.439	1.088	74.35	3.149	0.630	125.96
	Deep	1	2.035	0.204	0.11	14.242	1.424	7.54	6.119	0.612	41.82	3.543	0.354	70.85
	Total	**3**		0.565	**0.29**		3.956	**20.94**		1.700	**116.18**		0.984	**196.82**
2013	Shallow		1.583			11.077			4.759			2.755		
	Medium	1	1.809	0.181	0.09	12.659	1.266	6.70	5.439	0.544	37.18	3.149	0.315	62.98
	Deep	1	2.035	0.204	0.11	14.242	1.424	7.54	6.119	0.612	41.82	3.543	0.354	70.85
	Total	**2**		0.384	**0.20**		2.690	**14.24**		1.156	**79.00**		0.669	**133.84**
2014	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2015	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep	1	2.035	0.204	0.11	14.242	1.424	7.54	6.119	0.612	41.82	3.543	0.354	70.85
	Total	**1**		0.204	**0.11**		1.424	**7.54**		0.612	**41.82**		0.354	**70.85**
2016	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2017	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep	1	2.035	0.204	0.11	14.242	1.424	7.54	6.119	0.612	41.82	3.543	0.354	70.85
	Total	**1**		0.204	**0.11**		1.424	**7.54**		0.612	**41.82**		0.354	**70.85**
2018	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep	1	2.035	0.204	0.11	14.242	1.424	7.54	6.119	0.612	41.82	3.543	0.354	70.85
	Total	**1**		0.204	**0.11**		1.424	**7.54**		0.612	**41.82**		0.354	**70.85**
2019	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2020	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2021	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2022	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2023	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2024	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2025	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2026	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2027	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2028	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2029	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													

Table 4.4.7
Occurrence Spill Risks - Sale All - Exploration Wells

Year	Water Depth	Exploration Wells Blowout												
		N Wells	Small and Medium Spills 50-999 bbl			Large Spills 1000-9999 bbl			Spills 10000-149999 bbl			Spills =>150000 bbl		
			Expected Spill [bbl] =		519	Expected Spill [bbl] =		5292	Expected Spill [bbl] =		68349	Expected Spill [bbl] =		200000
		Cum.	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl
2030	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2031	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2032	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2033	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2034	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2035	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2036	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2037	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													
2038	Shallow		1.583			11.077			4.759			2.755		
	Medium		1.809			12.659			5.439			3.149		
	Deep		2.035			14.242			6.119			3.543		
	Total													

Table 4.4.8
Arctic Spill Occurrence - Sale All - Exploration Wells - Summary

Year	Production [MMbbl]	Small and Medium Spills 50-99 bbl			Large Spills 1000-9999 bbl			Huge Spills =>10000 bbl			All Spills		
		Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]
2004		0.158		0.082	0.476		5.862	0.751		87.639	1.386		93.583
2005		0.158		0.082	0.476		5.862	0.751		87.639	1.386		93.583
2006		0.158		0.082	0.476		5.862	0.751		87.639	1.386		93.583
2007		0.317		0.164	0.952		11.724	1.503		175.278	2.771		187.167
2008		0.339		0.176	1.020		12.561	1.610		187.798	2.969		200.536
2009		0.181		0.094	0.544		6.699	0.859		100.159	1.584		106.952
2010	**7.9**	0.339	0.043	0.176	1.020	0.129	12.561	1.610	0.204	187.798	2.969	0.376	200.536
2011	**15.7**												
2012	**23.6**	0.565	0.024	0.294	1.700	0.072	20.936	2.684	0.114	312.997	4.949	0.210	334.226
2013	**39.4**	0.384	0.010	0.200	1.156	0.029	14.236	1.825	0.046	212.838	3.365	0.085	227.274
2014	**44.4**												
2015	**55.3**	0.204	0.004	0.106	0.612	0.011	7.537	0.966	0.017	112.679	1.782	0.032	120.321
2016	**59.5**												
2017	**74.5**	0.204	0.003	0.106	0.612	0.008	7.537	0.966	0.013	112.679	1.782	0.024	120.321
2018	**76.1**	0.204	0.003	0.106	0.612	0.008	7.537	0.966	0.013	112.679	1.782	0.023	120.321
2019	**102.5**												
2020	**103.5**												
2021	**97.9**												
2022	**93.1**												
2023	**85.6**												
2024	**79.2**												
2025	**67.5**												
2026	**59.0**												
2027	**49.9**												
2028	**42.2**												
2029	**37.0**												
2030	**32.4**												
2031	**28.5**												
2032	**25.0**												
2033	**21.9**												
2034	**17.0**												
2035	**14.9**												
2036	**8.3**												
2037	**7.3**												
2038	**6.5**												

Table 4.4.9
Arctic Spill Occurrence Beaufort Sea Sale All Development Wells

Year	Water Depth	Development Wells Blowout												
		N Wells	Small and Medium Spills 50-999 bbl			Large Spills 1000-9999 bbl			Spills 10000-149999 bbl			Spills =>150000 bbl		
			Expected Spill [bbl] =		519	Expected Spill [bbl] =		5292	Expected Spill [bbl] =		68349	Expected Spill [bbl] =		200000
		Cum.	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl
2004	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2005	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2006	Shallow	2	0.484	0.010	0.01	3.383	0.068	0.36	1.453	0.029	1.99	1.453	0.029	5.81
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total	**2**		0.010	**0.01**		0.068	**0.36**		0.029	**1.99**		0.029	**5.81**
2007	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2008	Shallow	2	0.484	0.010	0.01	3.383	0.068	0.36	1.453	0.029	1.99	1.453	0.029	5.81
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total	**2**		0.010	**0.01**		0.068	**0.36**		0.029	**1.99**		0.029	**5.81**
2009	Shallow	2	0.484	0.010	0.01	3.383	0.068	0.36	1.453	0.029	1.99	1.453	0.029	5.81
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total	**2**		0.010	**0.01**		0.068	**0.36**		0.029	**1.99**		0.029	**5.81**
2010	Shallow		0.484			3.383			1.453			1.453		
	Medium	2	0.554	0.011	0.01	3.867	0.077	0.41	1.661	0.033	2.27	1.661	0.033	6.64
	Deep		0.623			4.350			1.868			1.868		
	Total	**2**		0.011	**0.01**		0.077	**0.41**		0.033	**2.27**		0.033	**6.64**
2011	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2012	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2013	Shallow		0.484			3.383			1.453			1.453		
	Medium	3	0.554	0.017	0.01	3.867	0.116	0.61	1.661	0.050	3.41	1.661	0.050	9.97
	Deep		0.623			4.350			1.868			1.868		
	Total	**3**		0.017	**0.01**		0.116	**0.61**		0.050	**3.41**		0.050	**9.97**
2014	Shallow		0.484			3.383			1.453			1.453		
	Medium	4	0.554	0.022	0.01	3.867	0.155	0.82	1.661	0.066	4.54	1.661	0.066	13.29
	Deep		0.623			4.350			1.868			1.868		
	Total	**4**		0.022	**0.01**		0.155	**0.82**		0.066	**4.54**		0.066	**13.29**
2015	Shallow		0.484			3.383			1.453			1.453		
	Medium	2	0.554	0.011	0.01	3.867	0.077	0.41	1.661	0.033	2.27	1.661	0.033	6.64
	Deep		0.623			4.350			1.868			1.868		
	Total	**2**		0.011	**0.01**		0.077	**0.41**		0.033	**2.27**		0.033	**6.64**
2016	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2017	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2018	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2019	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2020	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2021	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2022	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2023	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2024	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2025	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2026	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2027	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2028	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2029	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													

Table 4.4.9
Arctic Spill Occurrence Beaufort Sea Sale All Development Wells

Year	Water Depth	Development Wells Blowout												
		N Wells	Small and Medium Spills 50-999 bbl			Large Spills 1000-9999 bbl			Spills 10000-149999 bbl			Spills =>150000 bbl		
			Expected Spill [bbl] =		519	Expected Spill [bbl] =		5292	Expected Spill [bbl] =		68349	Expected Spill [bbl] =		200000
		Cum.	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl
2030	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2031	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2032	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2033	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2034	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2035	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2036	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2037	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													
2038	Shallow		0.484			3.383			1.453			1.453		
	Medium		0.554			3.867			1.661			1.661		
	Deep		0.623			4.350			1.868			1.868		
	Total													

Table 4.4.9
Arctic Spill Occurrence Beaufort Sea Sale All Development Wells

Year	Water Depth	Development Wells Blowout												
		N Wells	Small and Medium Spills 50-999 bbl			Large Spills 1000-9999 bbl			Spills 10000-149999 bbl			Spills =>150000 bbl		
			Expected Spill [bbl] =		**519**	Expected Spill [bbl] =		**5292**	Expected Spill [bbl] =		**68349**	Expected Spill [bbl] =		**200000**
		Cum.	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl

Table 4.4.10
Arctic Spill Occurrence - Sale All - Development Wells - Summary

Year	Production [MMbbl]	Small and Medium Spills 50-99 bbl			Large Spills 1000-9999 bbl			Huge Spills =>10000 bbl			All Spills		
		Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]
2004													
2005													
2006		0.010		0.005	0.029		0.358	0.058		7.799	0.097		8.163
2007													
2008		0.010		0.005	0.029		0.358	0.058		7.799	0.097		8.163
2009		0.010		0.005	0.029		0.358	0.058		7.799	0.097		8.163
2010	**7.9**	0.011	0.001	0.006	0.033	0.004	0.409	0.066	0.008	8.914	0.111	0.014	9.329
2011	**15.7**												
2012	**23.6**												
2013	**39.4**	0.017	0.000	0.009	0.050	0.001	0.614	0.100	0.003	13.370	0.166	0.004	13.993
2014	**44.4**	0.022	0.000	0.012	0.066	0.001	0.819	0.133	0.003	17.827	0.221	0.005	18.657
2015	**55.3**	0.011	0.000	0.006	0.033	0.001	0.409	0.066	0.001	8.914	0.111	0.002	9.329
2016	**59.5**												
2017	**74.5**												
2018	**76.1**												
2019	**102.5**												
2020	**103.5**												
2021	**97.9**												
2022	**93.1**												
2023	**85.6**												
2024	**79.2**												
2025	**67.5**												
2026	**59.0**												
2027	**49.9**												
2028	**42.2**												
2029	**37.0**												
2030	**32.4**												
2031	**28.5**												
2032	**25.0**												
2033	**21.9**												
2034	**17.0**												
2035	**14.9**												
2036	**8.3**												
2037	**7.3**												
2038	**6.5**												

Table 4.4.11
Arctic Spill Occurrence - Sale All - Wells - Summary

Year	Production [MMbbl]	Small and Medium Spills 50-999 bbl			Large Spills 1000-9999 bbl			Huge Spills =>10000 bbl			Significant Spills =>1000 bbl			All Spills		
		Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 103years	Frequency Spills per 109 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]
2004		0.158		0.082	0.476		5.862	0.751		87.639	1.227		93.501	1.386		93.583
2005		0.158		0.082	0.476		5.862	0.751		87.639	1.227		93.501	1.386		93.583
2006		0.168		0.087	0.505		6.220	0.810		95.439	1.315		101.659	1.483		101.746
2007		0.317		0.164	0.952		11.724	1.503		175.278	2.455		187.002	2.771		187.167
2008		0.349		0.181	1.049		12.920	1.668		195.597	2.717		208.517	3.066		208.698
2009		0.221		0.115	0.665		8.198	1.071		126.584	1.736		134.782	1.958		134.897
2010	**7.9**	0.484	0.061	0.251	1.453	0.184	17.912	2.344	0.297	277.423	3.797	0.481	295.336	4.281	0.542	295.587
2011	**15.7**	0.267	0.017	0.139	0.800	0.051	9.883	1.334	0.085	161.423	2.134	0.136	171.307	2.401	0.153	171.445
2012	**23.6**	0.966	0.041	0.502	2.900	0.123	35.761	4.685	0.199	555.132	7.585	0.321	590.892	8.551	0.362	591.394
2013	**39.4**	1.007	0.026	0.523	3.022	0.077	37.278	4.952	0.126	592.515	7.974	0.202	629.793	8.980	0.228	630.315
2014	**44.4**	0.761	0.017	0.395	2.283	0.051	28.188	3.827	0.086	464.845	6.110	0.138	493.033	6.871	0.155	493.428
2015	**55.3**	1.056	0.019	0.549	3.169	0.057	39.117	5.240	0.095	630.697	8.409	0.152	669.813	9.465	0.171	670.362
2016	**59.5**	0.975	0.016	0.506	2.924	0.049	36.112	4.874	0.082	589.816	7.799	0.131	625.928	8.773	0.147	626.434
2017	**74.5**	1.312	0.018	0.681	3.937	0.053	48.591	6.507	0.087	783.206	10.444	0.140	831.797	11.756	0.158	832.478
2018	**76.1**	1.558	0.020	0.809	4.675	0.061	57.714	7.739	0.102	932.212	12.414	0.163	989.926	13.972	0.184	990.735
2019	**102.5**	1.601	0.016	0.831	4.802	0.047	59.300	8.004	0.078	968.539	12.806	0.125	#######	14.407	0.141	#######
2020	**103.5**	1.806	0.017	0.938	5.418	0.052	66.903	9.030	0.087	#######	14.448	0.140	#######	16.254	0.157	#######
2021	**97.9**	2.011	0.021	1.045	6.034	0.062	74.505	10.056	0.103	#######	16.090	0.164	#######	18.101	0.185	#######
2022	**93.1**	2.114	0.023	1.098	6.342	0.068	78.306	10.569	0.114	#######	16.911	0.182	#######	19.025	0.204	#######
2023	**85.6**	2.114	0.025	1.098	6.342	0.074	78.306	10.569	0.123	#######	16.911	0.198	#######	19.025	0.222	#######
2024	**79.2**	2.114	0.027	1.098	6.342	0.080	78.306	10.569	0.133	#######	16.911	0.214	#######	19.025	0.240	#######
2025	**67.5**	1.878	0.028	0.975	5.633	0.083	69.563	9.389	0.139	#######	15.023	0.223	#######	16.900	0.250	#######
2026	**59.0**	1.878	0.032	0.975	5.633	0.095	69.563	9.389	0.159	#######	15.023	0.255	#######	16.900	0.286	#######
2027	**49.9**	1.642	0.033	0.853	4.925	0.099	60.821	8.209	0.165	993.374	13.135	0.263	#######	14.776	0.296	#######
2028	**42.2**	1.406	0.033	0.730	4.217	0.100	52.078	7.029	0.167	850.576	11.246	0.267	902.654	12.652	0.300	903.384
2029	**37.0**	1.406	0.038	0.730	4.217	0.114	52.078	7.029	0.190	850.576	11.246	0.304	902.654	12.652	0.342	903.384
2030	**32.4**	1.406	0.043	0.730	4.217	0.130	52.078	7.029	0.217	850.576	11.246	0.347	902.654	12.652	0.391	903.384
2031	**28.5**	1.406	0.049	0.730	4.217	0.148	52.078	7.029	0.247	850.576	11.246	0.395	902.654	12.652	0.444	903.384
2032	**25.0**	1.406	0.056	0.730	4.217	0.169	52.078	7.029	0.281	850.576	11.246	0.450	902.654	12.652	0.506	903.384
2033	**21.9**	1.406	0.064	0.730	4.217	0.193	52.078	7.029	0.321	850.576	11.246	0.514	902.654	12.652	0.578	903.384
2034	**17.0**	1.170	0.069	0.608	3.509	0.206	43.335	5.849	0.344	707.779	9.36	0.55	751.11	10.528	0.619	751.721
2035	**14.9**	1.170	0.079	0.608	3.509	0.236	43.335	5.849	0.393	707.779	9.36	0.63	751.11	10.528	0.707	751.721
2036	**8.3**	0.698	0.084	0.362	2.093	0.252	25.849	3.489	0.420	422.184	5.58	0.67	448.03	6.280	0.757	448.395
2037	**7.3**	0.698	0.096	0.362	2.093	0.287	25.849	3.489	0.478	422.184	5.58	0.76	448.03	6.280	0.860	448.395
2038	**6.5**	0.698	0.107	0.362	2.093	0.322	25.849	3.489	0.537	422.184	5.58	0.86	448.03	6.280	0.966	448.395
Total LOF	**1375.6**	**39.781**		**21**	**119.362**		**1474**	**198.180**		**23922**	**317.542**		**25395**	**357.322**		**25416**
Average LOF		**1.137**	**0.029**	**1**	**3.410**	**0.087**	**42**	**5.662**	**0.144**	**683**	**9.073**	**0.231**	**726**	**10.209**	**0.260**	**726**

Table 4.4.12
Arctic Spill Occurrence - Sale All - Summary

Year	Facility	Production [MMbbl]	Small and Medium Spills 50-999 bbl			Large Spills 1000-9999 bbl			Huge Spills =>10000 bbl			All Spills		
			Frequency Spills per 10^3 years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3 years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3 years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3 years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]
2004	Pipeline													
	Platforms													
	Production Wells													
	Exploration Wells		0.158		0.082	0.476		5.862	0.751		87.639	1.386		93.583
	Development Wells													
	Total		0.158		0.082	0.476		5.862	0.751		87.639	1.386		93.583
2005	Pipeline													
	Platforms													
	Production Wells													
	Exploration Wells		0.158		0.082	0.476		5.862	0.751		87.639	1.386		93.583
	Development Wells													
	Total		0.158		0.082	0.476		5.862	0.751		87.639	1.386		93.583
2006	Pipeline													
	Platforms													
	Production Wells													
	Exploration Wells		0.158		0.082	0.476		5.862	0.751		87.639	1.386		93.583
	Development Wells		0.010		0.005	0.029		0.358	0.058		7.799	0.097		8.163
	Total		0.168		0.087	0.505		6.220	0.810		95.439	1.483		101.746
2007	Pipeline													
	Platforms													
	Production Wells													
	Exploration Wells		0.317		0.164	0.952		11.724	1.503		175.278	2.771		187.167
	Development Wells													
	Total		0.317		0.164	0.952		11.724	1.503		175.278	2.771		187.167
2008	Pipeline													
	Platforms													
	Production Wells													
	Exploration Wells		0.339		0.176	1.020		12.561	1.610		187.798	2.969		200.536
	Development Wells		0.010		0.005	0.029		0.358	0.058		7.799	0.097		8.163
	Total		0.349		0.181	1.049		12.920	1.668		195.597	3.066		208.698
2009	Pipeline													
	Platforms		0.486		0.220	0.041		0.232	0.041		0.232	0.568		0.683
	Production Wells		0.031		0.016	0.092		1.140	0.154		18.626	0.277		19.782
	Exploration Wells		0.181		0.094	0.544		6.699	0.859		100.159	1.584		106.952
	Development Wells		0.010		0.005	0.029		0.358	0.058		7.799	0.097		8.163
	Total		0.707		0.335	0.706		8.430	1.112		126.816	2.526		135.580
2010	Pipeline	7.9	1.367	0.173	0.525	1.105	0.140	5.721	0.354	0.045	5.504	2.826	0.358	11.751
	Platforms		2.105	0.266	0.951	0.178	0.023	1.004	0.178	0.023	1.004	2.461	0.312	2.959
	Production Wells		0.133	0.017	0.069	0.400	0.051	4.942	0.667	0.084	80.712	1.201	0.152	85.723
	Exploration Wells		0.339	0.043	0.176	1.020	0.129	12.561	1.610	0.204	187.798	2.969	0.376	200.536
	Development Wells		0.011	0.001	0.006	0.033	0.004	0.409	0.066	0.008	8.914	0.111	0.014	9.329
	Total		3.955	0.501	1.727	2.737	0.346	24.638	2.876	0.364	283.932	9.568	1.211	310.297
2011	Pipeline	15.7	1.367	0.087	0.525	1.105	0.070	5.721	0.354	0.023	5.504	2.826	0.180	11.751
	Platforms		4.210	0.268	1.902	0.357	0.023	2.008	0.357	0.023	2.008	4.923	0.314	5.918
	Production Wells		0.267	0.017	0.139	0.800	0.051	9.883	1.334	0.085	161.423	2.401	0.153	171.445
	Exploration Wells													
	Development Wells													
	Total		5.843	0.372	2.566	2.262	0.144	17.613	2.045	0.130	168.936	10.150	0.647	189.114
2012	Pipeline	23.6	2.734	0.116	1.050	2.211	0.094	11.443	0.708	0.030	11.009	5.652	0.240	23.501
	Platforms		6.315	0.268	2.854	0.535	0.023	3.012	0.535	0.023	3.012	7.384	0.313	8.878
	Production Wells		0.400	0.017	0.208	1.201	0.051	14.825	2.001	0.085	242.135	3.602	0.153	257.168
	Exploration Wells		0.565	0.024	0.294	1.700	0.072	20.936	2.684	0.114	312.997	4.949	0.210	334.226
	Development Wells													
	Total		10.014	0.424	4.405	5.646	0.239	50.215	5.928	0.251	569.152	21.587	0.915	623.773
2013	Pipeline	39.4	4.100	0.104	1.575	3.316	0.084	17.164	1.062	0.027	16.513	8.478	0.215	35.252
	Platforms		9.553	0.242	4.317	0.809	0.021	4.556	0.809	0.021	4.556	11.171	0.284	13.430
	Production Wells		0.605	0.015	0.314	1.816	0.046	22.428	3.027	0.077	366.307	5.449	0.138	389.049
	Exploration Wells		0.384	0.010	0.200	1.156	0.029	14.236	1.825	0.046	212.838	3.365	0.085	227.274
	Development Wells		0.017	0.000	0.009	0.050	0.001	0.614	0.100	0.003	13.370	0.166	0.004	13.993
	Total		14.660	0.372	6.415	7.147	0.181	58.998	6.823	0.173	613.584	28.630	0.727	678.997
2014	Pipeline	44.4	4.100	0.092	1.575	3.316	0.075	17.164	1.062	0.024	16.513	8.478	0.191	35.252
	Platforms		11.683	0.263	5.280	0.990	0.022	5.572	0.990	0.022	5.572	13.662	0.308	16.424
	Production Wells		0.739	0.017	0.384	2.216	0.050	27.369	3.694	0.083	447.018	6.649	0.150	474.771
	Exploration Wells													
	Development Wells		0.022	0.000	0.012	0.066	0.001	0.819	0.133	0.003	17.827	0.221	0.005	18.657
	Total		16.544	0.373	7.250	6.589	0.148	50.924	5.878	0.132	486.931	29.011	0.653	545.105
2015	Pipeline	55.3	6.796	0.123	2.611	5.464	0.099	28.279	1.752	0.032	27.240	14.011	0.253	58.129
	Platforms		13.387	0.242	6.050	1.134	0.021	6.384	1.134	0.021	6.384	15.654	0.283	18.818
	Production Wells		0.841	0.015	0.437	2.524	0.046	31.171	4.207	0.076	509.104	7.573	0.137	540.712
	Exploration Wells		0.204	0.004	0.106	0.612	0.011	7.537	0.966	0.017	112.679	1.782	0.032	120.321
	Development Wells		0.011	0.000	0.006	0.033	0.001	0.409	0.066	0.001	8.914	0.111	0.002	9.329
	Total		21.239	0.384	9.209	9.767	0.177	73.779	8.125	0.147	664.320	39.131	0.708	747.309
2016	Pipeline	59.5	6.796	0.114	2.611	5.464	0.092	28.279	1.752	0.029	27.240	14.011	0.235	58.129
	Platforms		15.602	0.262	7.051	1.321	0.022	7.440	1.321	0.022	7.440	18.244	0.307	21.930
	Production Wells		0.975	0.016	0.506	2.924	0.049	36.112	4.874	0.082	589.816	8.773	0.147	626.434
	Exploration Wells													
	Development Wells													
	Total		23.372	0.393	10.168	9.709	0.163	71.830	7.947	0.134	624.495	41.028	0.690	706.493
2017	Pipeline	74.5	10.950	0.147	4.169	8.454	0.113	43.790	2.693	0.036	41.823	22.097	0.297	89.783
	Platforms		17.816	0.239	8.052	1.509	0.020	8.495	1.509	0.020	8.495	20.833	0.280	25.041
	Production Wells		1.108	0.015	0.576	3.325	0.045	41.054	5.541	0.074	670.527	9.974	0.134	712.157
	Exploration Wells		0.204	0.003	0.106	0.612	0.008	7.537	0.966	0.013	112.679	1.782	0.024	120.321
	Development Wells													
	Total		30.078	0.404	12.902	13.900	0.187	100.876	10.709	0.144	833.524	54.686	0.734	947.302
2018	Pipeline	76.1	10.950	0.144	4.169	8.454	0.111	43.790	2.693	0.035	41.823	22.097	0.290	89.783
	Platforms		21.905	0.288	9.899	1.855	0.024	10.443	1.855	0.024	10.443	25.614	0.337	30.786
	Production Wells		1.354	0.018	0.704	4.063	0.053	50.177	6.772	0.089	819.533	12.190	0.160	870.414
	Exploration Wells		0.204	0.003	0.106	0.612	0.008	7.537	0.966	0.013	112.679	1.782	0.023	120.321
	Development Wells													
	Total		34.413	0.452	14.878	14.984	0.197	111.947	12.286	0.161	984.479	61.684	0.811	1111.304
2019	Pipeline	102.5	15.787	0.154	5.989	11.998	0.117	62.163	3.811	0.037	59.160	31.596	0.308	127.311
	Platforms		25.994	0.254	11.747	2.201	0.021	12.392	2.201	0.021	12.392	30.395	0.297	36.530
	Production Wells		1.601	0.016	0.831	4.802	0.047	59.300	8.004	0.078	968.539	14.407	0.141	1028.671
	Exploration Wells													
	Development Wells													
	Total		43.382	0.423	18.568	19.001	0.185	133.854	14.016	0.137	1040.091	76.398	0.745	1192.513
2020	Pipeline	103.5	15.787	0.153	5.989	11.998	0.116	62.163	3.811	0.037	59.160	31.596	0.305	127.311
	Platforms		29.401	0.284	13.287	2.489	0.024	14.015	2.489	0.024	14.015	34.379	0.332	41.318
	Production Wells		1.806	0.017	0.938	5.418	0.052	66.903	9.030	0.087	1092.711	16.254	0.157	1160.552
	Exploration Wells													
	Development Wells													
	Total		46.994	0.454	20.214	19.905	0.192	143.080	15.330	0.148	1165.886	82.229	0.794	1329.181

Table 4.4.12
Arctic Spill Occurrence - Sale All - Summary

Year	Facility	Production [MMbbl]	Small and Medium Spills 50-999 bbl			Large Spills 1000-9999 bbl			Huge Spills =>10000 bbl			All Spills		
			Frequency Spills per 10^3 years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3 years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3 years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3 years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]
2021	Pipeline	97.9	15.787	0.161	5.989	11.998	0.123	62.163	3.811	0.039	59.160	31.596	0.323	127.311
	Platforms		32.809	0.335	14.827	2.777	0.028	15.639	2.777	0.028	15.639	38.363	0.392	46.105
	Production Wells		2.011	0.021	1.045	6.034	0.062	74.505	10.056	0.103	1216.883	18.101	0.185	1292.433
	Exploration Wells													
	Development Wells													
	Total		50.607	0.517	21.861	20.809	0.213	152.307	16.645	0.170	1291.681	88.060	0.899	1465.849
2022	Pipeline	93.1	15.787	0.170	5.989	11.998	0.129	62.163	3.811	0.041	59.160	31.596	0.339	127.311
	Platforms		34.512	0.371	15.597	2.921	0.031	16.451	2.921	0.031	16.451	40.355	0.433	48.498
	Production Wells		2.114	0.023	1.098	6.342	0.068	78.306	10.569	0.114	1278.969	19.025	0.204	1358.373
	Exploration Wells													
	Development Wells													
	Total		52.413	0.563	22.684	21.261	0.228	156.920	17.302	0.186	1354.579	90.976	0.977	1534.183
2023	Pipeline	85.6	15.787	0.184	5.989	11.998	0.140	62.163	3.811	0.045	59.160	31.596	0.369	127.311
	Platforms		34.512	0.403	15.597	2.921	0.034	16.451	2.921	0.034	16.451	40.355	0.471	48.498
	Production Wells		2.114	0.025	1.098	6.342	0.074	78.306	10.569	0.123	1278.969	19.025	0.222	1358.373
	Exploration Wells													
	Development Wells													
	Total		52.413	0.612	22.684	21.261	0.248	156.920	17.302	0.202	1354.579	90.976	1.063	1534.183
2024	Pipeline	79.2	15.787	0.199	5.989	11.998	0.151	62.163	3.811	0.048	59.160	31.596	0.399	127.311
	Platforms		34.512	0.436	15.597	2.921	0.037	16.451	2.921	0.037	16.451	40.355	0.510	48.498
	Production Wells		2.114	0.027	1.098	6.342	0.080	78.306	10.569	0.133	1278.969	19.025	0.240	1358.373
	Exploration Wells													
	Development Wells													
	Total		52.413	0.662	22.684	21.261	0.268	156.920	17.302	0.218	1354.579	90.976	1.149	1534.183
2025	Pipeline	67.5	14.421	0.214	5.464	10.892	0.161	56.441	3.457	0.051	53.655	28.770	0.426	115.561
	Platforms		30.788	0.456	13.914	2.606	0.039	14.675	2.606	0.039	14.675	36.000	0.533	43.263
	Production Wells		1.878	0.028	0.975	5.633	0.083	69.563	9.389	0.139	1136.171	16.900	0.250	1206.710
	Exploration Wells													
	Development Wells													
	Total		47.087	0.698	20.353	19.132	0.283	140.679	15.452	0.229	1204.501	81.671	1.210	1365.534
2026	Pipeline	59.0	14.421	0.244	5.464	10.892	0.185	56.441	3.457	0.059	53.655	28.770	0.488	115.561
	Platforms		30.788	0.522	13.914	2.606	0.044	14.675	2.606	0.044	14.675	36.000	0.610	43.263
	Production Wells		1.878	0.032	0.975	5.633	0.095	69.563	9.389	0.159	1136.171	16.900	0.286	1206.710
	Exploration Wells													
	Development Wells													
	Total		47.087	0.798	20.353	19.132	0.324	140.679	15.452	0.262	1204.501	81.671	1.384	1365.534
2027	Pipeline	49.9	13.054	0.262	4.939	9.787	0.196	50.720	3.103	0.062	48.151	25.944	0.520	103.810
	Platforms		27.064	0.542	12.231	2.291	0.046	12.898	2.291	0.046	12.898	31.645	0.634	38.027
	Production Wells		1.642	0.033	0.853	4.925	0.099	60.821	8.209	0.165	993.374	14.776	0.296	1055.047
	Exploration Wells													
	Development Wells													
	Total		41.760	0.837	18.023	17.003	0.341	124.439	13.603	0.273	1054.423	72.366	1.450	1196.884
2028	Pipeline	42.2	11.004	0.261	4.152	8.129	0.193	42.138	2.572	0.061	39.894	21.705	0.514	86.184
	Platforms		23.340	0.553	10.548	1.975	0.047	11.122	1.975	0.047	11.122	27.290	0.647	32.792
	Production Wells		1.406	0.033	0.730	4.217	0.100	52.078	7.029	0.167	850.576	12.652	0.300	903.384
	Exploration Wells													
	Development Wells													
	Total		35.750	0.847	15.430	14.321	0.339	105.337	11.577	0.274	901.592	61.647	1.461	1022.360
2029	Pipeline	37.0	11.004	0.297	4.152	8.129	0.220	42.138	2.572	0.070	39.894	21.705	0.587	86.184
	Platforms		23.340	0.631	10.548	1.975	0.053	11.122	1.975	0.053	11.122	27.290	0.738	32.792
	Production Wells		1.406	0.038	0.730	4.217	0.114	52.078	7.029	0.190	850.576	12.652	0.342	903.384
	Exploration Wells													
	Development Wells													
	Total		35.750	0.966	15.430	14.321	0.387	105.337	11.577	0.313	901.592	61.647	1.666	1022.360
2030	Pipeline	32.4	9.637	0.297	3.627	7.023	0.217	36.416	2.219	0.068	34.390	18.879	0.583	74.433
	Platforms		23.340	0.720	10.548	1.975	0.061	11.122	1.975	0.061	11.122	27.290	0.842	32.792
	Production Wells		1.406	0.043	0.730	4.217	0.130	52.078	7.029	0.217	850.576	12.652	0.391	903.384
	Exploration Wells													
	Development Wells													
	Total		34.383	1.061	14.905	13.216	0.408	99.616	11.223	0.346	896.088	58.821	1.815	1010.609
2031	Pipeline	25.0	9.637	0.338	3.096	7.023	0.246	33.016	2.219	0.078	31.897	18.879	0.662	68.008
	Platforms		23.340	0.819	10.548	1.975	0.069	11.122	1.975	0.069	11.122	27.290	0.958	32.792
	Production Wells		1.406	0.049	0.730	4.217	0.148	52.078	7.029	0.247	850.576	12.652	0.444	903.384
	Exploration Wells													
	Development Wells													
	Total		34.383	1.206	14.374	13.216	0.464	96.215	11.223	0.394	893.595	58.821	2.064	1004.184
2032	Pipeline	21.9	9.637	0.385	3.627	7.023	0.281	36.416	2.219	0.089	34.390	18.879	0.755	74.433
	Platforms		23.340	0.934	10.548	1.975	0.079	11.122	1.975	0.079	11.122	27.290	1.092	32.792
	Production Wells		1.406	0.056	0.730	4.217	0.169	52.078	7.029	0.281	850.576	12.652	0.506	903.384
	Exploration Wells													
	Development Wells													
	Total		34.383	1.375	14.905	13.216	0.529	99.616	11.223	0.449	896.088	58.821	2.353	1010.609
2033	Pipeline	14.9	9.637	0.440	3.627	7.023	0.321	36.416	2.219	0.101	34.390	18.879	0.862	74.433
	Platforms		23.340	1.066	10.548	1.975	0.090	11.122	1.975	0.090	11.122	27.290	1.246	32.792
	Production Wells		1.406	0.064	0.730	4.217	0.193	52.078	7.029	0.321	850.576	12.652	0.578	903.384
	Exploration Wells													
	Development Wells													
	Total		34.383	1.570	14.905	13.216	0.603	99.616	11.223	0.512	896.088	58.821	2.686	1010.609
2034	Pipeline	8.3	8.308	0.489	3.116	5.981	0.352	31.023	1.883	0.111	29.168	16.172	0.951	63.307
	Platforms		19.422	1.142	8.777	1.644	0.097	9.255	1.644	0.097	9.255	22.709	1.336	27.287
	Production Wells		1.170	0.069	0.608	3.509	0.206	43.335	5.849	0.344	707.779	10.528	0.619	751.721
	Exploration Wells													
	Development Wells													
	Total		28.900	1.700	12.500	11.134	0.655	83.613	9.375	0.551	746.201	49.409	2.906	842.314
2035	Pipeline	6.5	8.308	0.558	3.116	5.981	0.401	31.023	1.883	0.126	29.168	16.172	1.085	63.307
	Platforms		19.422	1.303	8.777	1.644	0.110	9.255	1.644	0.110	9.255	22.709	1.524	27.287
	Production Wells		1.170	0.079	0.608	3.509	0.236	43.335	5.849	0.393	707.779	10.528	0.707	751.721
	Exploration Wells													
	Development Wells													
	Total		28.900	1.940	12.500	11.134	0.747	83.613	9.375	0.629	746.201	49.409	3.316	842.314
2036	Pipeline		5.502	0.663	2.076	4.064	0.490	21.069	1.286	0.155	19.947	10.852	1.308	43.092
	Platforms		11.585	1.396	5.235	0.980	0.118	5.520	0.980	0.118	5.520	13.546	1.632	16.276
	Production Wells		0.698	0.084	0.362	2.093	0.252	25.849	3.489	0.420	422.184	6.280	0.757	448.395
	Exploration Wells													
	Development Wells													
	Total		17.784	2.143	7.674	7.138	0.860	52.438	5.755	0.693	447.651	30.678	3.696	507.763
2037	Pipeline		5.502	0.754	2.076	4.064	0.557	21.069	1.286	0.176	19.947	10.852	1.487	43.092
	Platforms		11.585	1.587	5.235	0.980	0.134	5.520	0.980	0.134	5.520	13.546	1.856	16.276
	Production Wells		0.698	0.096	0.362	2.093	0.287	25.849	3.489	0.478	422.184	6.280	0.860	448.395
	Exploration Wells													
	Development Wells													
	Total		17.784	2.436	7.674	7.138	0.978	52.438	5.755	0.788	447.651	30.678	4.202	507.763
	Pipeline		5.502	0.846	2.076	4.064	0.625	21.069	1.286	0.198	19.947	10.852	1.670	43.092
	Platforms		11.585	1.782	5.235	0.980	0.151	5.520	0.980	0.151	5.520	13.546	2.084	16.276

Table 4.4.12
Arctic Spill Occurrence - Sale All - Summary

Year	Facility	Production [MMbbl]	Small and Medium Spills 50-999 bbl			Large Spills 1000-9999 bbl			Huge Spills =>10000 bbl			All Spills		
			Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]
2038	Production Wells		0.698	0.107	0.362	2.093	0.322	25.849	3.489	0.537	422.184	6.280	0.966	448.395
	Exploration Wells													
	Development Wells													
	Total		17.784	2.736	7.674	7.138	1.098	52.438	5.755	0.885	447.651	30.678	4.720	507.763

Table 4.4.13
Arctic Spill Occurrence - Sale All - Annual Summary

Year	Production [MMbbl]	Small and Medium Spills 50-999 bbl			Large Spills 1000-9999 bbl			Huge Spills =>10000 bbl			Significant Spills =>1000 bbl			All Spills		
		Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 103years	Frequency Spills per 109 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]
2004		0.158		0.082	0.476		5.862	0.751		87.639	1.227		93.501	1.386		93.583
2005		0.158		0.082	0.476		5.862	0.751		87.639	1.227		93.501	1.386		93.583
2006		0.168		0.087	0.505		6.220	0.810		95.439	1.315		101.659	1.483		101.746
2007		0.317		0.164	0.952		11.724	1.503		175.278	2.455		187.002	2.771		187.167
2008		0.349		0.181	1.049		12.920	1.668		195.597	2.717		208.517	3.066		208.698
2009		0.707		0.335	0.706		8.430	1.112		126.816	1.819		135.245	2.526		135.580
2010	**7.9**	3.955	0.015	1.727	2.737	0.046	24.638	2.876	0.077	283.932	5.613	0.123	308.569	9.568	0.200	310.297
2011	**15.7**	5.843	0.010	2.566	2.262	0.029	17.613	2.045	0.046	168.936	4.307	0.076	186.548	10.150	0.122	189.114
2012	**23.6**	10.014	0.000	4.405	5.646	0.001	50.215	5.928	0.003	569.152	11.574	0.004	619.368	21.587	0.006	623.773
2013	**39.4**	14.660	0.372	6.415	7.147	0.181	58.998	6.823	0.173	613.584	13.970	0.355	672.583	28.630	0.727	678.997
2014	**44.4**	16.544	0.373	7.250	6.589	0.148	50.924	5.878	0.132	486.931	12.467	0.281	537.855	29.011	0.653	545.105
2015	**55.3**	21.239	0.384	9.209	9.767	0.177	73.779	8.125	0.147	664.320	17.892	0.324	738.100	39.131	0.708	747.309
2016	**59.5**	23.372	0.393	10.168	9.709	0.163	71.830	7.947	0.134	624.495	17.656	0.297	696.325	41.028	0.690	706.493
2017	**74.5**	30.078	0.404	12.902	13.900	0.187	100.876	10.709	0.144	833.524	24.608	0.330	934.400	54.686	0.734	947.302
2018	**76.1**	34.413	0.452	14.878	14.984	0.197	111.947	12.286	0.161	984.479	27.271	0.358	#######	61.684	0.811	#######
2019	**102.5**	43.382	0.423	18.568	19.001	0.185	133.854	14.016	0.137	#######	33.016	0.322	#######	76.398	0.745	#######
2020	**103.5**	46.994	0.454	20.214	19.905	0.192	143.080	15.330	0.148	#######	35.235	0.340	#######	82.229	0.794	#######
2021	**97.9**	50.607	0.517	21.861	20.809	0.213	152.307	16.645	0.170	#######	37.453	0.383	#######	88.060	0.899	#######
2022	**93.1**	52.413	0.563	22.684	21.261	0.228	156.920	17.302	0.186	#######	38.563	0.414	#######	90.976	0.977	#######
2023	**85.6**	52.413	0.612	22.684	21.261	0.248	156.920	17.302	0.202	#######	38.563	0.450	#######	90.976	1.063	#######
2024	**79.2**	52.413	0.662	22.684	21.261	0.268	156.920	17.302	0.218	#######	38.563	0.487	#######	90.976	1.149	#######
2025	**67.5**	47.087	0.698	20.353	19.132	0.283	140.679	15.452	0.229	#######	34.584	0.512	#######	81.671	1.210	#######
2026	**59.0**	47.087	0.798	20.353	19.132	0.324	140.679	15.452	0.262	#######	34.584	0.586	#######	81.671	1.384	#######
2027	**49.9**	41.760	0.837	18.023	17.003	0.341	124.439	13.603	0.273	#######	30.606	0.613	#######	72.366	1.450	#######
2028	**42.2**	35.750	0.847	15.430	14.321	0.339	105.337	11.577	0.274	901.592	25.898	0.614	#######	61.647	1.461	#######
2029	**37.0**	35.750	0.966	15.430	14.321	0.387	105.337	11.577	0.313	901.592	25.898	0.700	#######	61.647	1.666	#######
2030	**32.4**	34.383	1.061	14.905	13.216	0.408	99.616	11.223	0.346	896.088	24.438	0.754	995.704	58.821	1.815	#######
2031	**28.5**	34.383	1.206	14.374	13.216	0.464	96.215	11.223	0.394	893.595	24.438	0.857	989.810	58.821	2.064	#######
2032	**25.0**	34.383	1.375	14.905	13.216	0.529	99.616	11.223	0.449	896.088	24.438	0.978	995.704	58.821	2.353	#######
2033	**21.9**	34.383	1.570	14.905	13.216	0.603	99.616	11.223	0.512	896.088	24.438	1.116	995.704	58.821	2.686	#######
2034	**17.0**	28.900	1.700	12.500	11.134	0.655	83.613	9.375	0.551	746.20	20.51	1.21	829.81	49.409	2.906	842.314
2035	**14.9**	28.900	1.940	12.500	11.134	0.747	83.613	9.375	0.629	746.20	20.51	1.38	829.81	49.409	3.316	842.314
2036	**8.3**	17.784	2.143	7.674	7.138	0.860	52.438	5.755	0.693	447.65	12.89	1.55	500.09	30.678	3.696	507.763
2037	**7.3**	17.784	2.436	7.674	7.138	0.978	52.438	5.755	0.788	447.65	12.89	1.77	500.09	30.678	4.202	507.763
2038	**6.5**	17.784	2.736	7.674	7.138	1.098	52.438	5.755	0.885	447.65	12.89	1.98	500.09	30.678	4.720	507.763
Total LOF	**1375.6**	**916.315**		**396**	**380.855**		**2848**	**315.678**		**25243**	**696.533**		**28091**	**1612.848**		**28487**
Average LOF		**26.180**	**0.666**	**11**	**10.882**	**0.277**	**81**	**9.019**	**0.229**	**721**	**19.901**	**0.506**	**803**	**46.081**	**1.172**	**814**

Table 4.4.14
Sale All - Year 2024 - Monte Carlo Results

Sale All Year 2024	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills
	Frequency Spills per 10^3 years					Frequency Spills per 10^9 bbl Produced					Spill Index [bbl]				
Mean =	52.45	21.26	17.30	38.56	91.01	0.66	0.27	0.22	0.49	1.15	22.73	156.27	1353.38	1509.65	1532.37
Std Deviation =	20.57	6.40	4.06	8.78	22.34	0.26	0.08	0.05	0.11	0.28	15.21	71.44	510.79	517.30	517.37
Variance =	423.036	40.954	16.455	77.053	499.235	0.067	0.007	0.003	0.012	0.080	231.338	5103.875	260906.500	267599.800	267671.600
Skewness =	0.60	0.47	0.04	0.21	0.50	0.60	0.47	0.04	0.21	0.50	1.46	0.79	0.46	0.44	0.44
Kurtosis =	2.75	2.92	2.82	2.85	2.91	2.75	2.92	2.82	2.85	2.91	5.62	3.73	3.22	3.20	3.20
Mode =	55.69	23.48	19.56	43.68	85.03	0.70	0.30	0.20	0.32	1.07	28.49	103.49	1300.75	1426.65	1857.77
Minimum =	13.749	5.866	4.490	14.450	37.305	0.174	0.074	0.057	0.182	0.471	-0.045	0.472	108.240	217.958	231.395
5% Perc =	24.290	11.935	10.700	24.771	58.660	0.307	0.151	0.135	0.313	0.741	5.959	58.422	577.892	709.892	732.034
10% Perc =	28.100	13.590	12.105	27.682	63.667	0.355	0.172	0.153	0.350	0.804	7.677	72.975	719.287	867.236	885.112
15% Perc =	31.234	14.755	13.038	29.604	67.934	0.394	0.186	0.165	0.374	0.858	9.213	85.000	832.765	977.707	1002.789
20% Perc =	33.724	15.781	13.829	31.015	71.151	0.426	0.199	0.175	0.392	0.898	10.428	94.781	911.530	1064.031	1083.715
25% Perc =	36.279	16.540	14.513	32.317	74.441	0.458	0.209	0.183	0.408	0.940	11.729	104.082	986.034	1145.211	1165.662
30% Perc =	38.489	17.341	15.103	33.534	77.236	0.486	0.219	0.191	0.423	0.975	12.967	112.654	1058.358	1212.308	1233.480
35% Perc =	41.230	18.141	15.673	34.688	80.101	0.521	0.229	0.198	0.438	1.011	14.241	121.292	1127.945	1280.512	1304.389
40% Perc =	43.802	18.959	16.212	35.791	82.608	0.553	0.239	0.205	0.452	1.043	15.676	129.251	1192.571	1348.844	1370.789
45% Perc =	46.209	19.696	16.699	37.025	85.447	0.583	0.249	0.211	0.467	1.079	17.146	137.663	1250.660	1404.168	1429.349
50% Perc =	48.820	20.466	17.252	38.151	88.336	0.616	0.258	0.218	0.482	1.115	18.709	146.624	1310.894	1465.355	1489.497
55% Perc =	51.908	21.262	17.790	39.320	91.038	0.655	0.268	0.225	0.496	1.149	20.366	155.272	1378.852	1535.364	1557.961
60% Perc =	55.201	22.257	18.324	40.466	94.386	0.697	0.281	0.231	0.511	1.192	22.313	164.544	1447.672	1600.281	1625.762
65% Perc =	58.479	23.196	18.891	41.693	98.049	0.738	0.293	0.239	0.526	1.238	24.323	175.867	1518.871	1674.450	1699.064
70% Perc =	62.423	24.311	19.509	42.885	101.970	0.788	0.307	0.246	0.541	1.287	26.689	185.200	1596.052	1754.972	1775.350
75% Perc =	66.391	25.463	20.065	44.478	106.083	0.838	0.322	0.253	0.562	1.339	29.514	197.819	1672.334	1838.206	1858.481
80% Perc =	70.531	26.738	20.767	46.127	110.150	0.891	0.338	0.262	0.582	1.391	33.362	211.034	1767.142	1938.538	1959.780
85% Perc =	75.765	28.238	21.572	47.936	114.918	0.957	0.357	0.272	0.605	1.451	37.496	227.636	1884.478	2060.512	2078.367
90% Perc =	82.226	30.081	22.611	50.401	121.986	1.038	0.380	0.285	0.636	1.540	43.785	254.222	2030.915	2202.656	2222.262
95% Perc =	90.639	32.887	24.025	53.495	132.122	1.144	0.415	0.303	0.675	1.668	53.653	288.119	2248.560	2419.572	2441.614
Maximum =	129.818	44.548	30.621	69.495	170.762	1.639	0.562	0.387	0.877	2.156	110.761	503.024	3598.909	3683.093	3701.255

Table 4.4.15
Sale All LOF Average - Pipeline - Monte Carlo Results

Sale All Pipeline	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills
All years Average LOF	**Frequency Spills per 10^3years**					**Frequency Spills per 10^9 bbl Produced**					**Spill Index [bbl]**				
Mean =	7.98	6.03	1.92	7.94	15.92	0.20	0.15	0.05	0.20	0.41	3.02	31.28	29.65	60.93	63.95
Std Deviation =	2.95	2.80	0.93	2.96	4.20	0.08	0.07	0.02	0.08	0.11	2.12	22.56	15.72	27.43	27.52
Variance =	8.697	7.844	0.868	8.736	17.618	0.006	0.005	0.001	0.006	0.011	4.515	509.103	247.210	752.679	757.100
Skewness =	0.55	0.68	0.70	0.58	0.38	0.55	0.68	0.70	0.58	0.38	1.48	1.33	0.91	0.91	0.91
Kurtosis =	2.83	2.93	3.02	2.93	2.93	2.83	2.93	3.02	2.93	2.93	5.75	5.08	3.64	4.11	4.10
Mode =	5.80	4.36	0.96	6.41	18.78	0.15	0.11	0.03	0.25	0.48	4.96	17.62	24.13	62.70	77.58
Minimum =	1.766	0.762	0.214	1.504	4.562	0.045	0.019	0.005	0.038	0.116	-0.051	-3.569	2.469	7.090	8.102
5% Perc =	3.809	2.336	0.692	3.824	9.569	0.097	0.059	0.018	0.097	0.243	0.667	5.161	9.912	24.220	27.174
10% Perc =	4.417	2.835	0.832	4.492	10.672	0.112	0.072	0.021	0.114	0.272	0.943	8.135	12.228	29.559	32.575
15% Perc =	4.916	3.191	0.957	4.917	11.481	0.125	0.081	0.024	0.125	0.292	1.127	10.667	14.043	33.773	36.431
20% Perc =	5.328	3.518	1.063	5.300	12.182	0.136	0.090	0.027	0.135	0.310	1.312	12.918	15.805	37.070	40.115
25% Perc =	5.696	3.814	1.190	5.684	12.811	0.145	0.097	0.030	0.145	0.326	1.486	14.875	17.583	40.833	43.775
30% Perc =	6.055	4.147	1.287	6.033	13.387	0.154	0.106	0.033	0.154	0.341	1.652	17.004	19.260	43.966	46.994
35% Perc =	6.429	4.439	1.387	6.385	14.007	0.164	0.113	0.035	0.163	0.356	1.847	18.931	20.854	47.119	50.177
40% Perc =	6.782	4.775	1.506	6.728	14.559	0.173	0.121	0.038	0.171	0.370	2.031	21.024	22.557	50.444	53.534
45% Perc =	7.199	5.131	1.618	7.103	15.126	0.183	0.131	0.041	0.181	0.385	2.221	23.199	24.342	53.703	56.675
50% Perc =	7.639	5.512	1.741	7.525	15.676	0.194	0.140	0.044	0.191	0.399	2.438	25.666	26.376	56.809	59.833
55% Perc =	8.024	5.924	1.883	7.943	16.150	0.204	0.151	0.048	0.202	0.411	2.679	28.229	28.558	60.327	63.287
60% Perc =	8.485	6.340	2.031	8.352	16.786	0.216	0.161	0.052	0.213	0.427	2.953	31.107	30.995	63.555	66.595
65% Perc =	8.929	6.814	2.187	8.803	17.398	0.227	0.173	0.056	0.224	0.443	3.242	34.328	33.266	67.544	70.501
70% Perc =	9.405	7.316	2.370	9.354	18.055	0.239	0.186	0.060	0.238	0.459	3.598	37.556	35.853	72.183	75.053
75% Perc =	9.881	7.892	2.538	9.910	18.692	0.251	0.201	0.065	0.252	0.476	3.983	42.069	39.071	76.663	79.633
80% Perc =	10.543	8.465	2.734	10.481	19.501	0.268	0.215	0.070	0.267	0.496	4.469	47.300	42.697	81.585	84.550
85% Perc =	11.252	9.199	2.936	11.190	20.411	0.286	0.234	0.075	0.285	0.519	5.098	53.287	46.763	88.177	91.251
90% Perc =	12.052	10.032	3.231	12.114	21.518	0.307	0.255	0.082	0.308	0.547	5.967	62.270	51.421	97.102	100.452
95% Perc =	13.353	11.284	3.669	13.411	23.186	0.340	0.287	0.093	0.341	0.590	7.311	77.272	59.574	112.514	115.380
Maximum =	19.827	17.344	6.280	20.874	35.399	0.504	0.441	0.160	0.531	0.901	16.675	147.784	114.625	198.617	199.930

Table 4.4.16
Sale All LOF Average - Platforms - Monte Carlo Results

Sale All Platforms	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills
All years Average LOF	**Frequency Spills per 10^3years**					**Frequency Spills per 10^9 bbl Produced**					**Spill Index [bbl]**				
Mean =	17.06	1.44	1.44	2.89	19.95	0.43	0.04	0.04	0.07	0.51	7.72	8.21	8.21	16.42	24.14
Std Deviation =	9.62	0.85	0.85	1.69	9.80	0.24	0.02	0.02	0.04	0.25	7.18	6.68	6.68	13.37	15.19
Variance =	92.489	0.715	0.715	2.860	95.962	0.060	0.000	0.000	0.002	0.062	51.511	44.667	44.667	178.669	230.697
Skewness =	0.65	0.67	0.67	0.67	0.63	0.65	0.67	0.67	0.67	0.63	1.55	1.27	1.27	1.27	0.97
Kurtosis =	2.75	2.75	2.75	2.75	2.76	2.75	2.75	2.75	2.75	2.76	5.60	4.65	4.65	4.65	3.88
Mode =	6.94	0.47	0.47	0.94	13.86	0.18	0.01	0.01	0.02	0.35	1.45	1.52	1.52	3.05	32.42
Minimum =	1.672	0.096	0.096	0.192	3.342	0.043	0.002	0.002	0.005	0.085	-1.911	-3.582	-3.582	-7.164	-1.901
5% Perc =	4.579	0.350	0.350	0.700	6.950	0.116	0.009	0.009	0.018	0.177	0.489	0.782	0.782	1.563	5.196
10% Perc =	5.799	0.463	0.463	0.926	8.500	0.148	0.012	0.012	0.024	0.216	1.053	1.472	1.472	2.943	7.277
15% Perc =	6.854	0.558	0.558	1.117	9.642	0.174	0.014	0.014	0.028	0.245	1.491	2.012	2.012	4.024	8.977
20% Perc =	8.006	0.654	0.654	1.307	10.799	0.204	0.017	0.017	0.033	0.275	1.958	2.588	2.588	5.176	10.692
25% Perc =	9.142	0.753	0.753	1.507	11.933	0.233	0.019	0.019	0.038	0.304	2.447	3.167	3.167	6.335	12.303
30% Perc =	10.268	0.848	0.848	1.696	13.287	0.261	0.022	0.022	0.043	0.338	3.008	3.753	3.753	7.505	14.032
35% Perc =	11.333	0.950	0.950	1.900	14.381	0.288	0.024	0.024	0.048	0.366	3.576	4.313	4.313	8.627	15.844
40% Perc =	12.688	1.052	1.052	2.104	15.602	0.323	0.027	0.027	0.054	0.397	4.189	4.930	4.930	9.859	17.510
45% Perc =	14.039	1.168	1.168	2.336	16.839	0.357	0.030	0.030	0.059	0.428	4.807	5.660	5.660	11.320	19.342
50% Perc =	15.550	1.284	1.284	2.568	18.253	0.396	0.033	0.033	0.065	0.464	5.457	6.472	6.472	12.945	21.329
55% Perc =	16.870	1.416	1.416	2.833	19.769	0.429	0.036	0.036	0.072	0.503	6.226	7.283	7.283	14.567	23.233
60% Perc =	18.373	1.554	1.554	3.107	21.416	0.467	0.040	0.040	0.079	0.545	7.151	8.276	8.276	16.552	25.295
65% Perc =	20.074	1.696	1.696	3.392	23.074	0.511	0.043	0.043	0.086	0.587	8.168	9.162	9.162	18.324	27.628
70% Perc =	21.775	1.856	1.856	3.712	24.771	0.554	0.047	0.047	0.094	0.630	9.370	10.276	10.276	20.552	30.071
75% Perc =	23.558	2.026	2.026	4.052	26.529	0.599	0.052	0.052	0.103	0.675	10.745	11.546	11.546	23.093	32.761
80% Perc =	25.594	2.194	2.194	4.388	28.645	0.651	0.056	0.056	0.112	0.729	12.434	13.140	13.140	26.279	36.004
85% Perc =	28.140	2.391	2.391	4.783	31.056	0.716	0.061	0.061	0.122	0.790	14.858	15.120	15.120	30.240	39.790
90% Perc =	30.915	2.677	2.677	5.353	34.003	0.787	0.068	0.068	0.136	0.865	17.867	17.686	17.686	35.371	45.432
95% Perc =	35.091	3.041	3.041	6.082	38.073	0.893	0.077	0.077	0.155	0.969	22.829	21.705	21.705	43.410	53.339
Maximum =	54.673	4.966	4.966	9.931	59.336	1.391	0.126	0.126	0.253	1.510	50.298	45.654	45.654	91.308	100.394

Table 4.4.17
Sale All LOF Average - Wells - Monte Carlo Results

Sale All Wells	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills
All years Average LOF	**Frequency Spills per 10^3years**					**Frequency Spills per 10^9 bbl Produced**					**Spill Index [bbl]**				
Mean =	1.16	3.48	5.80	9.28	10.44	0.03	0.09	0.15	0.24	0.27	0.60	42.77	701.78	744.54	745.14
Std Deviation =	0.43	1.28	1.56	2.71	2.76	0.01	0.03	0.04	0.07	0.07	0.41	27.92	261.72	263.21	263.22
Variance =	0.181	1.630	2.419	7.370	7.612	0.000	0.001	0.002	0.005	0.005	0.169	779.617	########	69282.110	69283.520
Skewness =	-0.02	-0.01	0.00	0.00	0.00	-0.02	-0.01	0.00	0.00	0.00	0.76	0.86	0.49	0.49	0.49
Kurtosis =	2.43	2.42	2.70	2.56	2.59	2.43	2.42	2.70	2.56	2.59	3.36	3.59	3.21	3.20	3.20
Mode =	1.48	3.91	5.78	9.32	11.46	0.03	0.10	0.15	0.24	0.29	0.48	27.75	717.36	640.81	701.94
Minimum =	0.114	0.265	1.135	1.891	2.359	0.003	0.007	0.029	0.048	0.060	-0.231	-7.006	106.755	132.868	133.022
5% Perc =	0.439	1.317	3.220	4.740	5.946	0.011	0.034	0.082	0.121	0.151	0.045	6.033	308.804	346.898	347.412
10% Perc =	0.584	1.738	3.803	5.699	6.788	0.015	0.044	0.097	0.145	0.173	0.129	10.760	381.613	427.042	427.906
15% Perc =	0.691	2.080	4.148	6.349	7.470	0.018	0.053	0.106	0.162	0.190	0.189	14.975	434.214	475.326	476.543
20% Perc =	0.780	2.341	4.442	6.874	8.010	0.020	0.060	0.113	0.175	0.204	0.239	18.473	477.991	518.629	519.037
25% Perc =	0.855	2.565	4.707	7.369	8.488	0.022	0.065	0.120	0.187	0.216	0.288	21.959	515.933	557.511	558.097
30% Perc =	0.926	2.764	4.934	7.774	8.893	0.024	0.070	0.126	0.198	0.226	0.337	24.906	549.658	593.042	593.407
35% Perc =	0.997	2.972	5.161	8.171	9.279	0.025	0.076	0.131	0.208	0.236	0.390	28.009	583.670	625.401	625.641
40% Perc =	1.052	3.147	5.382	8.544	9.696	0.027	0.080	0.137	0.217	0.247	0.442	31.091	614.382	656.471	656.893
45% Perc =	1.105	3.312	5.590	8.909	10.062	0.028	0.084	0.142	0.227	0.256	0.484	34.758	647.357	692.013	692.604
50% Perc =	1.165	3.490	5.794	9.297	10.466	0.030	0.089	0.147	0.237	0.266	0.532	37.761	678.268	721.969	722.632
55% Perc =	1.215	3.656	6.000	9.636	10.820	0.031	0.093	0.153	0.245	0.275	0.583	41.241	711.185	753.124	753.916
60% Perc =	1.275	3.822	6.217	10.040	11.208	0.032	0.097	0.158	0.255	0.285	0.646	44.828	741.838	787.710	788.140
65% Perc =	1.330	4.004	6.444	10.394	11.566	0.034	0.102	0.164	0.264	0.294	0.704	49.547	779.298	821.676	822.183
70% Perc =	1.396	4.183	6.663	10.782	11.979	0.036	0.106	0.170	0.274	0.305	0.771	54.176	819.131	862.778	863.011
75% Perc =	1.466	4.404	6.899	11.224	12.371	0.037	0.112	0.176	0.286	0.315	0.844	59.119	867.297	908.546	909.304
80% Perc =	1.540	4.620	7.159	11.672	12.873	0.039	0.118	0.182	0.297	0.328	0.934	64.461	917.072	959.622	960.082
85% Perc =	1.626	4.879	7.474	12.258	13.422	0.041	0.124	0.190	0.312	0.342	1.035	71.755	978.749	1022.035	1022.520
90% Perc =	1.739	5.213	7.806	12.845	14.063	0.044	0.133	0.199	0.327	0.358	1.165	82.106	1056.846	1098.501	1099.204
95% Perc =	1.860	5.602	8.314	13.730	14.962	0.047	0.143	0.212	0.349	0.381	1.395	96.535	1167.215	1213.940	1214.135
Maximum =	2.290	6.746	10.891	17.511	18.505	0.058	0.172	0.277	0.446	0.471	2.374	175.015	1901.427	1920.087	1920.471

Table 4.4.18
Sale All LOF Average Platforms + Wells - Monte Carlo Results

Sale All Platforms + Wells	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills
All years Average LOF	**Frequency Spills per 10^3years**					**Frequency Spills per 10^9 bbl Produced**					**Spill Index [bbl]**				
Mean =	18.22	4.92	7.25	12.17	30.39	0.46	0.13	0.18	0.31	0.77	8.32	50.98	709.99	760.97	769.29
Std Deviation =	9.61	1.54	1.78	3.22	10.15	0.24	0.04	0.05	0.08	0.26	7.19	28.63	261.96	263.83	264.02
Variance =	92.435	2.374	3.160	10.342	103.020	0.060	0.002	0.002	0.007	0.067	51.662	819.415	########	69606.110	69704.840
Skewness =	0.65	0.11	0.09	0.11	0.55	0.65	0.11	0.09	0.11	0.55	1.54	0.80	0.49	0.49	0.49
Kurtosis =	2.76	2.66	2.77	2.72	2.77	2.76	2.66	2.77	2.72	2.77	5.61	3.51	3.21	3.20	3.20
Mode =	9.06	4.93	6.49	12.00	21.37	0.23	0.13	0.17	0.31	0.54	2.53	30.52	740.14	651.43	814.48
Minimum =	2.630	0.642	1.869	2.852	9.636	0.067	0.016	0.048	0.073	0.245	-1.806	-5.600	111.007	141.857	145.496
5% Perc =	5.741	2.428	4.380	6.992	16.453	0.146	0.062	0.111	0.178	0.419	1.029	12.242	317.648	361.610	368.706
10% Perc =	6.896	2.914	4.963	8.008	18.395	0.175	0.074	0.126	0.204	0.468	1.609	18.096	388.539	442.119	448.476
15% Perc =	8.081	3.280	5.364	8.765	19.782	0.206	0.083	0.136	0.223	0.503	2.133	22.412	441.967	489.426	498.891
20% Perc =	9.129	3.576	5.715	9.404	21.058	0.232	0.091	0.145	0.239	0.536	2.563	26.227	486.878	534.674	542.323
25% Perc =	10.338	3.854	5.997	9.869	22.328	0.263	0.098	0.153	0.251	0.568	3.058	29.517	524.213	573.935	581.810
30% Perc =	11.445	4.071	6.275	10.348	23.601	0.291	0.104	0.160	0.263	0.600	3.589	32.799	557.574	609.031	618.360
35% Perc =	12.534	4.268	6.509	10.820	24.966	0.319	0.109	0.166	0.275	0.635	4.192	36.407	591.172	642.615	650.440
40% Perc =	13.803	4.481	6.745	11.247	26.343	0.351	0.114	0.172	0.286	0.670	4.837	39.667	621.249	674.398	682.476
45% Perc =	15.184	4.675	6.968	11.701	27.607	0.386	0.119	0.177	0.298	0.702	5.384	42.996	656.098	708.690	715.943
50% Perc =	16.673	4.877	7.195	12.095	28.943	0.424	0.124	0.183	0.308	0.736	6.063	46.428	687.027	737.425	745.212
55% Perc =	18.114	5.065	7.452	12.522	30.395	0.461	0.129	0.190	0.319	0.773	6.844	49.943	717.842	768.714	777.410
60% Perc =	19.622	5.298	7.695	12.945	31.937	0.499	0.135	0.196	0.329	0.813	7.817	53.640	749.786	802.638	812.232
65% Perc =	21.295	5.519	7.936	13.404	33.504	0.542	0.140	0.202	0.341	0.852	8.799	57.955	788.946	839.157	847.322
70% Perc =	22.956	5.738	8.199	13.850	35.222	0.584	0.146	0.209	0.352	0.896	10.008	62.571	827.650	879.038	887.107
75% Perc =	24.732	6.010	8.467	14.384	37.265	0.629	0.153	0.215	0.366	0.948	11.405	67.449	875.338	923.778	932.314
80% Perc =	26.743	6.301	8.748	14.967	39.481	0.680	0.160	0.223	0.381	1.005	13.025	73.578	925.839	975.562	984.017
85% Perc =	29.138	6.616	9.103	15.631	41.796	0.741	0.168	0.232	0.398	1.063	15.479	81.018	987.202	1038.780	1046.746
90% Perc =	32.112	6.950	9.580	16.409	44.878	0.817	0.177	0.244	0.418	1.142	18.497	91.112	1065.238	1115.521	1125.099
95% Perc =	36.000	7.460	10.262	17.583	49.214	0.916	0.190	0.261	0.447	1.252	23.296	105.692	1175.295	1228.647	1237.990
Maximum =	55.712	10.348	13.769	23.358	74.959	1.418	0.263	0.350	0.594	1.907	51.181	188.948	1913.210	1943.654	1958.132

Table 4.4.19
Sale All LOF Average - Monte Carlo Results

Sale All	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills
All years Average LOF	Frequency Spills per 10^3years					Frequency Spills per 10^9 bbl Produced					Spill Index [bbl]				
Mean =	26.20	10.95	9.16	20.11	46.31	0.67	0.28	0.23	0.51	1.18	11.34	82.26	739.64	821.90	833.24
Std Deviation =	10.06	3.20	2.00	4.36	10.96	0.26	0.08	0.05	0.11	0.28	7.50	36.79	262.46	265.12	265.32
Variance =	101.167	10.263	3.981	19.011	120.159	0.065	0.007	0.003	0.012	0.078	56.231	1353.609	68884.080	########	70392.300
Skewness =	0.56	0.45	0.17	0.23	0.43	0.56	0.45	0.17	0.23	0.43	1.40	0.73	0.50	0.49	0.49
Kurtosis =	2.75	2.95	2.86	2.97	2.77	2.75	2.95	2.86	2.97	2.77	5.23	3.60	3.22	3.20	3.20
Mode =	20.71	9.66	8.43	19.23	45.16	0.53	0.32	0.22	0.60	1.18	9.33	59.32	1034.12	1086.74	685.51
Minimum =	5.557	2.796	3.456	8.154	19.902	0.141	0.071	0.088	0.207	0.506	0.056	4.827	119.554	182.250	187.308
5% Perc =	12.253	6.245	6.003	13.171	30.108	0.312	0.159	0.153	0.335	0.766	3.001	30.912	345.480	424.725	435.264
10% Perc =	14.034	7.027	6.648	14.621	32.871	0.357	0.179	0.169	0.372	0.836	3.902	39.042	419.705	500.281	511.145
15% Perc =	15.607	7.624	7.068	15.471	34.835	0.397	0.194	0.180	0.394	0.886	4.580	44.616	470.057	549.673	560.386
20% Perc =	16.925	8.141	7.462	16.286	36.606	0.431	0.207	0.190	0.414	0.931	5.251	50.426	515.496	592.396	604.794
25% Perc =	18.186	8.596	7.759	16.972	38.058	0.463	0.219	0.197	0.432	0.968	5.895	55.274	551.641	633.235	645.421
30% Perc =	19.500	9.040	8.032	17.689	39.528	0.496	0.230	0.204	0.450	1.006	6.543	59.633	586.833	667.615	678.263
35% Perc =	20.792	9.423	8.321	18.252	40.889	0.529	0.240	0.212	0.464	1.040	7.188	64.432	621.179	701.528	714.535
40% Perc =	22.116	9.807	8.598	18.896	42.286	0.563	0.250	0.219	0.481	1.076	7.868	68.370	650.183	733.600	745.247
45% Perc =	23.445	10.199	8.832	19.458	43.652	0.597	0.260	0.225	0.495	1.111	8.679	72.952	684.349	768.292	778.592
50% Perc =	24.795	10.612	9.093	19.990	45.175	0.631	0.270	0.231	0.509	1.149	9.447	77.507	718.142	797.384	809.383
55% Perc =	26.390	11.011	9.332	20.492	46.670	0.671	0.280	0.237	0.521	1.187	10.205	82.087	747.555	832.969	843.105
60% Perc =	27.744	11.468	9.607	21.049	48.214	0.706	0.292	0.244	0.536	1.227	11.094	87.007	781.206	865.789	877.363
65% Perc =	29.287	12.002	9.886	21.706	49.898	0.745	0.305	0.252	0.552	1.270	12.193	91.916	818.614	898.992	910.877
70% Perc =	31.009	12.485	10.196	22.404	51.665	0.789	0.318	0.259	0.570	1.315	13.262	97.783	855.700	939.932	951.311
75% Perc =	32.835	13.095	10.496	23.081	53.671	0.835	0.333	0.267	0.587	1.366	14.714	103.868	903.406	986.514	998.616
80% Perc =	35.195	13.721	10.861	23.778	55.933	0.895	0.349	0.276	0.605	1.423	16.471	111.516	956.060	1037.991	1049.752
85% Perc =	37.550	14.420	11.301	24.680	58.398	0.955	0.367	0.288	0.628	1.486	18.680	120.696	1017.347	1100.212	1111.977
90% Perc =	40.501	15.362	11.753	25.767	61.657	1.030	0.391	0.299	0.656	1.569	21.663	132.212	1092.852	1176.330	1188.650
95% Perc =	44.691	16.607	12.540	27.470	65.972	1.137	0.423	0.319	0.699	1.679	27.034	150.113	1204.383	1292.420	1300.916
Maximum =	63.638	25.275	16.696	38.058	88.453	1.619	0.643	0.425	0.968	2.251	54.455	254.302	1932.122	1974.712	1993.163

Table 4.4.20
Composition of Spill Indicators - Sale All - Year 2024

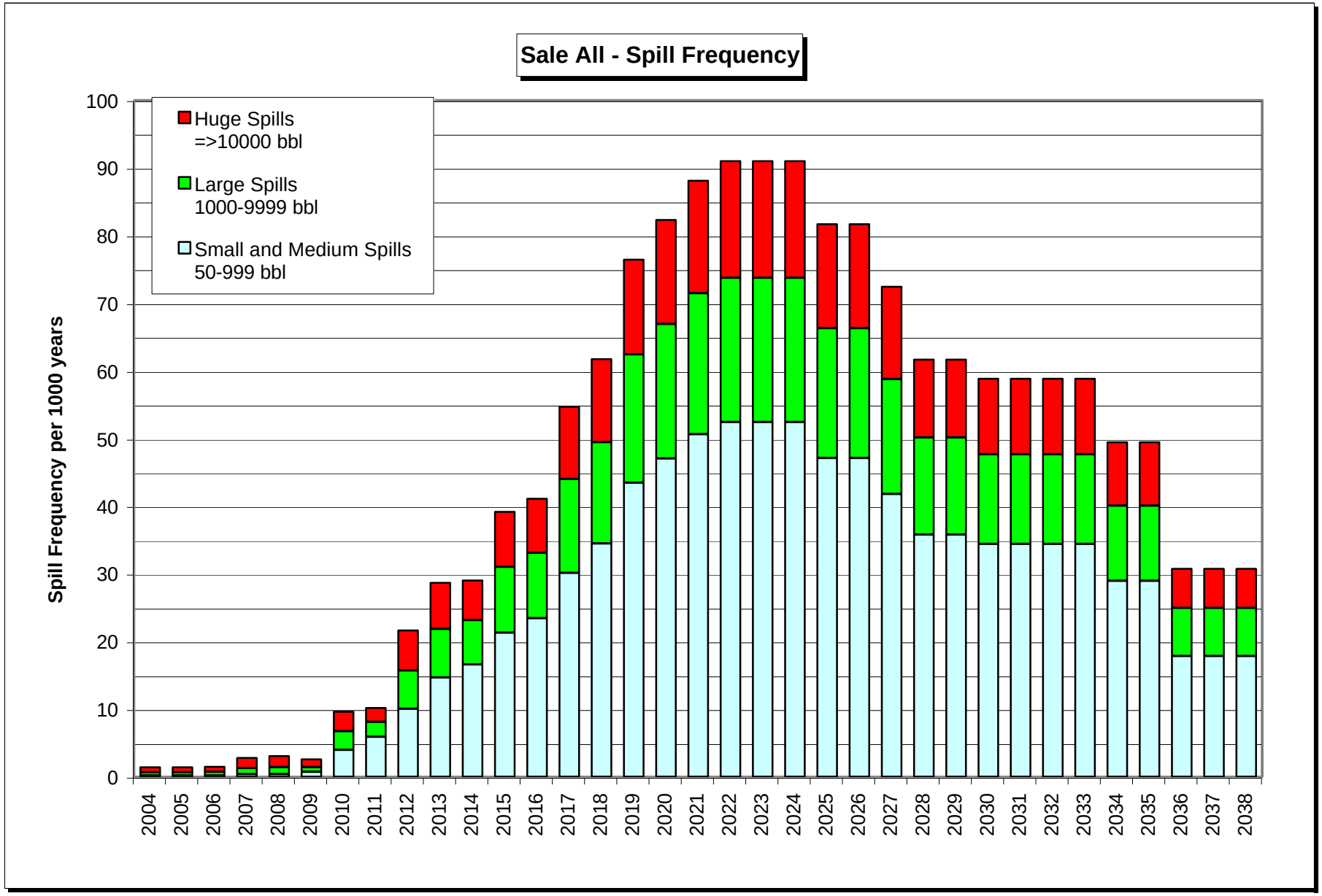
Spill Size	Spill Source									
	P/L		Platforms		Wells		Platforms and Wells		All	
	Sale All - Year 2024 Spill Frequency per 10^3 years									
Small and Medium Spills 50-999 bbl	15.787	50%	34.512	86%	2.114	11%	36.626	62%	52.413	58%
Large Spills 1000-9999 bbl	11.998	38%	2.921	7%	6.342	33%	9.263	16%	21.261	23%
Huge Spills =>10000 bbl	3.811	12%	2.921	7%	10.569	56%	13.491	23%	17.302	19%
Significant Spills =>1000 bbl	15.809	50%	5.843	14%	16.911	89%	22.754	38%	38.563	42%
All Spills	**31.596**	**100%**	**40.355**	**100%**	**19.025**	**100%**	**59.380**	**100%**	**90.976**	**100%**
	Sale All - LYear 2024 Spill Frequency per 10^9 bbl produced									
Small and Medium Spills 50-999 bbl	0.199	50%	0.436	86%	0.027	11%	0.462	62%	0.662	58%
Large Spills 1000-9999 bbl	0.151	38%	0.037	7%	0.080	33%	0.117	16%	0.268	23%
Huge Spills =>10000 bbl	0.048	12%	0.037	7%	0.133	56%	0.170	23%	0.218	19%
Significant Spills =>1000 bbl	0.200	50%	0.074	14%	0.214	89%	0.287	38%	0.487	42%
All Spills	**0.399**	**100%**	**0.510**	**100%**	**0.240**	**100%**	**0.750**	**100%**	**1.149**	**100%**
	Sale All - Year 2024 Spill Index [bbl]									
Small and Medium Spills 50-999 bbl	6	5%	16	32%	1	0%	17	1%	23	1%
Large Spills 1000-9999 bbl	62	49%	16	34%	78	6%	95	7%	157	10%
Huge Spills =>10000 bbl	59	46%	16	34%	1279	94%	1295	92%	1355	88%
Significant Spills =>1000 bbl	121	95%	33	68%	1357	100%	1390	99%	1511	99%
All Spills	**127**	**100%**	**48**	**100%**	**1358**	**100%**	**1407**	**100%**	**1534**	**100%**

Spill Source	Spill Size									
	S+M 50-999 bbl		Large 1000-9999 bbl		Huge =>10000 bbl		Significant =>1000 bbl		All Spills	
	Sale All - Year 2024 Spill Frequency per 10^3 years									
Pipelines	15.787	30%	11.998	56%	3.811	22%	15.809	41%	31.596	35%
Platforms	34.512	66%	2.921	14%	2.921	17%	5.843	15%	40.355	44%
Wells	2.114	4%	6.342	30%	10.569	61%	16.911	44%	19.025	21%
Platforms and Wells	36.626	70%	9.263	44%	13.491	78%	22.754	59%	59.380	65%
All	**52.413**	**100%**	**21.261**	**100%**	**17.302**	**100%**	**38.563**	**100%**	**90.976**	**100%**
	Sale All - Year 2024 Spill Frequency per 10^9 bbl produced									
Pipelines	0.199	30%	0.151	56%	0.048	22%	0.200	41%	0.399	35%
Platforms	0.436	66%	0.037	14%	0.037	17%	0.074	15%	0.510	44%
Wells	0.027	4%	0.080	30%	0.133	61%	0.214	44%	0.240	21%
Platforms and Wells	0.462	70%	0.117	44%	0.170	78%	0.287	59%	0.750	65%
All	**0.662**	**100%**	**0.268**	**100%**	**0.218**	**100%**	**0.487**	**100%**	**1.149**	**100%**
	Sale All - Year 2024 Spill Index [bbl]									
Pipelines	6	26%	62	40%	59	4%	121	8%	127	8%
Platforms	16	69%	16	10%	16	1%	33	2%	48	3%
Wells	1	5%	78	50%	1279	94%	1357	90%	1358	89%
Platforms and Wells	17	74%	95	60%	1295	96%	1390	92%	1407	92%
All	**23**	**100%**	**157**	**100%**	**1355**	**100%**	**1511**	**100%**	**1534**	**100%**

Table 4.4.21
Composition of Spill Indicators - Sale All - LOF Average

Spill Size	Spill Source									
	P/L		Platforms		Wells		Platforms and Wells		All	
	Sale All - LOF Average Spill Frequency per 10^3 years									
Small and Medium Spills 50-999 bbl	7.984	50%	17.059	86%	1.137	11%	18.196	60%	26.180	57%
Large Spills 1000-9999 bbl	6.027	38%	1.444	7%	3.410	33%	4.854	16%	10.882	24%
Huge Spills =>10000 bbl	1.913	12%	1.444	7%	5.662	55%	7.106	24%	9.019	20%
Significant Spills =>1000 bbl	7.940	50%	2.888	14%	9.073	89%	11.961	40%	19.901	43%
All Spills	**15.925**	**100%**	**19.947**	**100%**	**10.209**	**100%**	**30.157**	**100%**	**46.081**	**100%**
	Sale All - LOF Average Spill Frequency per 10^9 bbl produced									
Small and Medium Spills 50-999 bbl	0.203	50%	0.434	86%	0.029	11%	0.463	60%	0.666	57%
Large Spills 1000-9999 bbl	0.153	38%	0.037	7%	0.087	33%	0.124	16%	0.277	24%
Huge Spills =>10000 bbl	0.049	12%	0.037	7%	0.144	55%	0.181	24%	0.229	20%
Significant Spills =>1000 bbl	0.202	50%	0.073	14%	0.231	89%	0.304	40%	0.506	43%
All Spills	**0.405**	**100%**	**0.508**	**100%**	**0.260**	**100%**	**0.767**	**100%**	**1.172**	**100%**
	Sale All - LOF Average Spill Index [bbl]									
Small and Medium Spills 50-999 bbl	3	5%	8	32%	1	0%	8	1%	11	1%
Large Spills 1000-9999 bbl	31	49%	8	34%	42	6%	50	7%	81	10%
Huge Spills =>10000 bbl	30	46%	8	34%	683	94%	692	92%	721	89%
Significant Spills =>1000 bbl	61	95%	16	68%	726	100%	742	99%	803	99%
All Spills	**64**	**100%**	**24**	**100%**	**726**	**100%**	**750**	**100%**	**814**	**100%**

Spill Source	Spill Size									
	S+M 50-999 bbl		Large 1000-9999 bbl		Huge =>10000 bbl		Significant =>1000 bbl		All Spills	
	Sale All - LOF Average Spill Frequency per 10^3 years									
Pipelines	7.984	30%	6.027	55%	1.913	21%	7.940	40%	15.925	35%
Platforms	17.059	65%	1.444	13%	1.444	16%	2.888	15%	19.947	43%
Wells	1.137	4%	3.410	31%	5.662	63%	9.073	46%	10.209	22%
Platforms and Wells	18.196	70%	4.854	45%	7.106	79%	11.961	60%	30.157	65%
All	**26.180**	**100%**	**10.882**	**100%**	**9.019**	**100%**	**19.901**	**100%**	**46.081**	**100%**
	Sale All - LOF Average Spill Frequency per 10^9 bbl produced									
Pipelines	0.203	30%	0.153	55%	0.049	21%	0.202	40%	0.405	35%
Platforms	0.434	65%	0.037	13%	0.037	16%	0.073	15%	0.508	43%
Wells	0.029	4%	0.087	31%	0.144	63%	0.231	46%	0.260	22%
Platforms and Wells	0.463	70%	0.124	45%	0.181	79%	0.304	60%	0.767	65%
All	**0.666**	**100%**	**0.277**	**100%**	**0.229**	**100%**	**0.506**	**100%**	**1.172**	**100%**
	Sale All - LOF Average Spill Index [bbl]									
Pipelines	3	27%	31	38%	30	4%	61	8%	64	8%
Platforms	8	68%	8	10%	8	1%	16	2%	24	3%
Wells	1	5%	42	52%	683	95%	726	90%	726	89%
Platforms and Wells	8	73%	50	62%	692	96%	742	92%	750	92%
All	**11**	**100%**	**81**	**100%**	**721**	**100%**	**803**	**100%**	**814**	**100%**


Sale All - Spill Frequency
Huge Spills
=>10000 bbl
Large Spills
1000-9999 bbl
Small and Medium Spills
50-999 bbl
Spill Frequency per 1000 years
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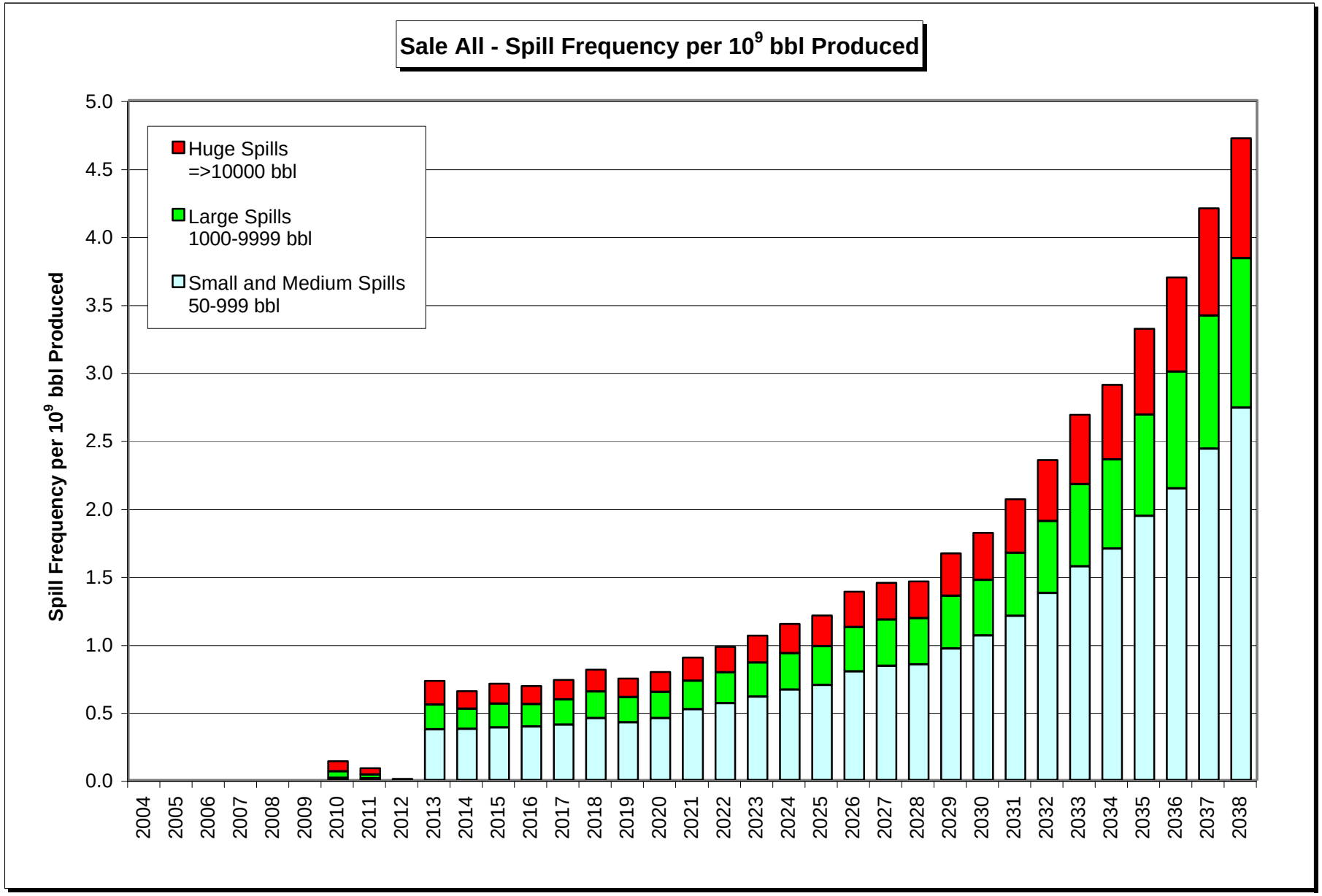
Sale All - Spill Frequency per 10^9 bbl Produced
Huge Spills
=>10000 bbl
Large Spills
1000-9999 bbl
Small and Medium Spills
50-999 bbl
Spill Frequency per 10^9 bbl Produced
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2032
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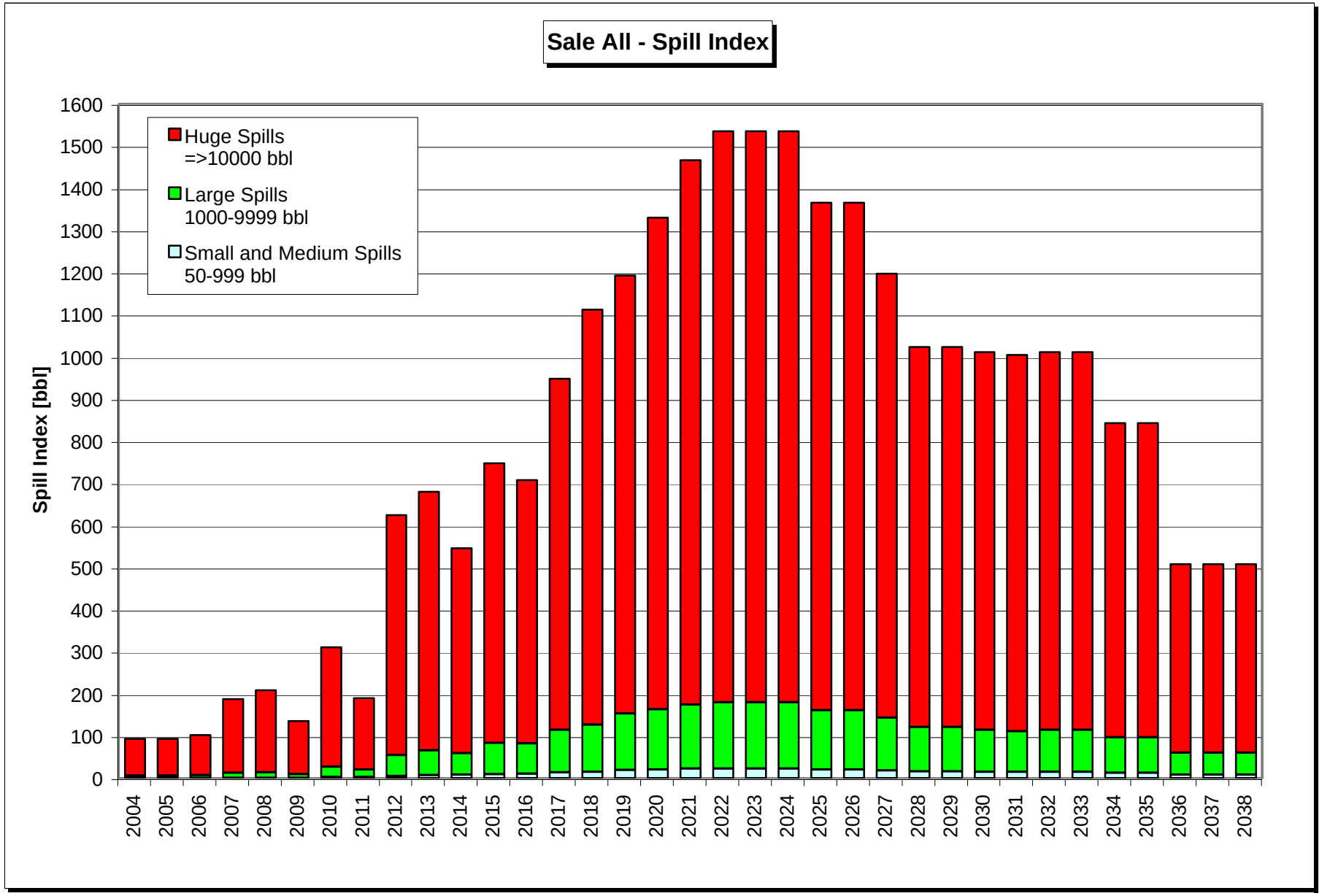
2034
2035
2036
2037
2038


Sale All - Spill Index
Huge Spills
=>10000 bbl
Large Spills
1000-9999 bbl
Small and Medium Spills
50-999 bbl
Spill Index [bbl]
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
1400
1500
1600
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
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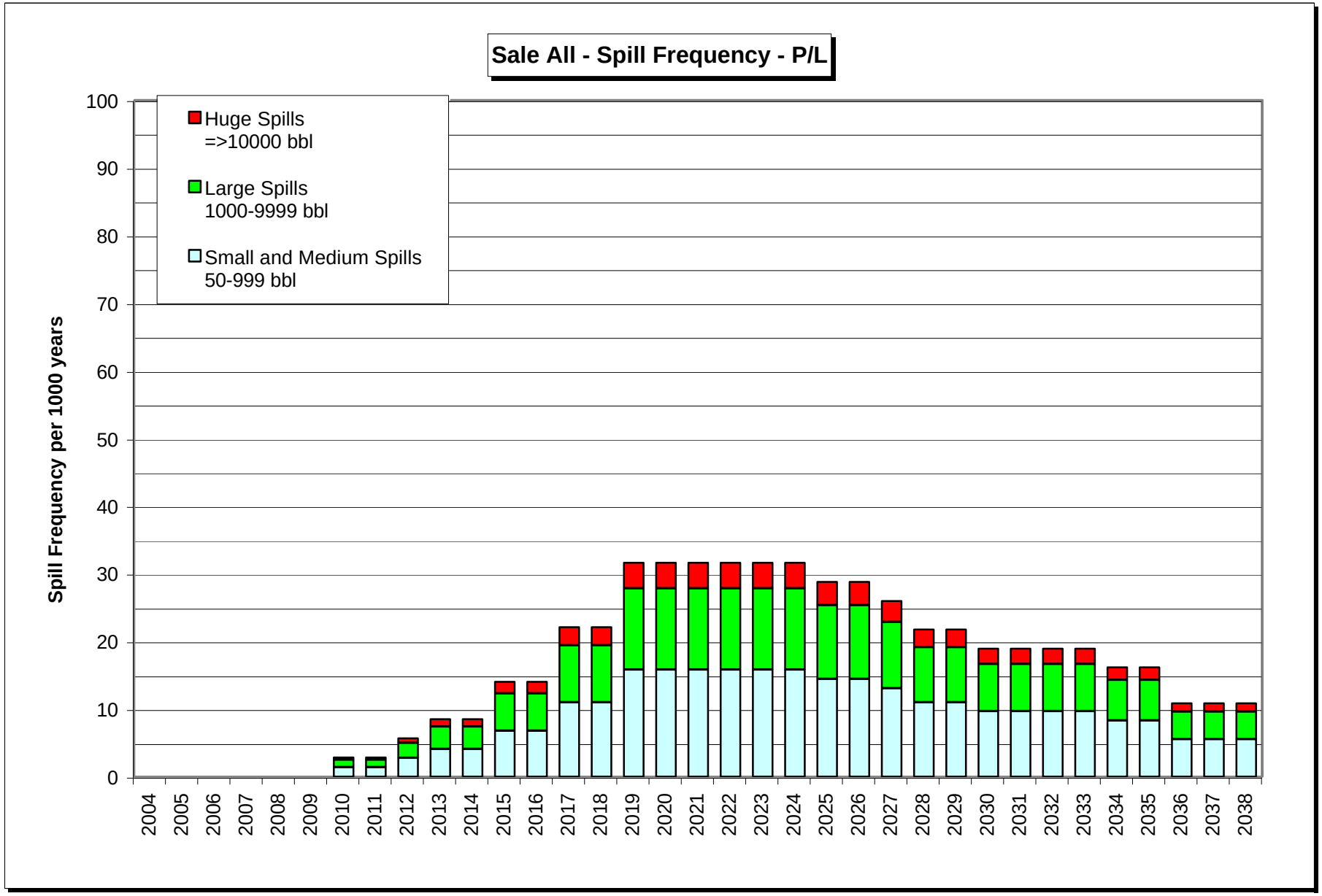
2036
2037
2038


Sale All - Spill Frequency - P/L
Huge Spills
=>10000 bbl
Large Spills
1000-9999 bbl
Small and Medium Spills
50-999 bbl
Spill Frequency per 1000 years
0
10
20
30
40
50
60
70
80
90
100
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
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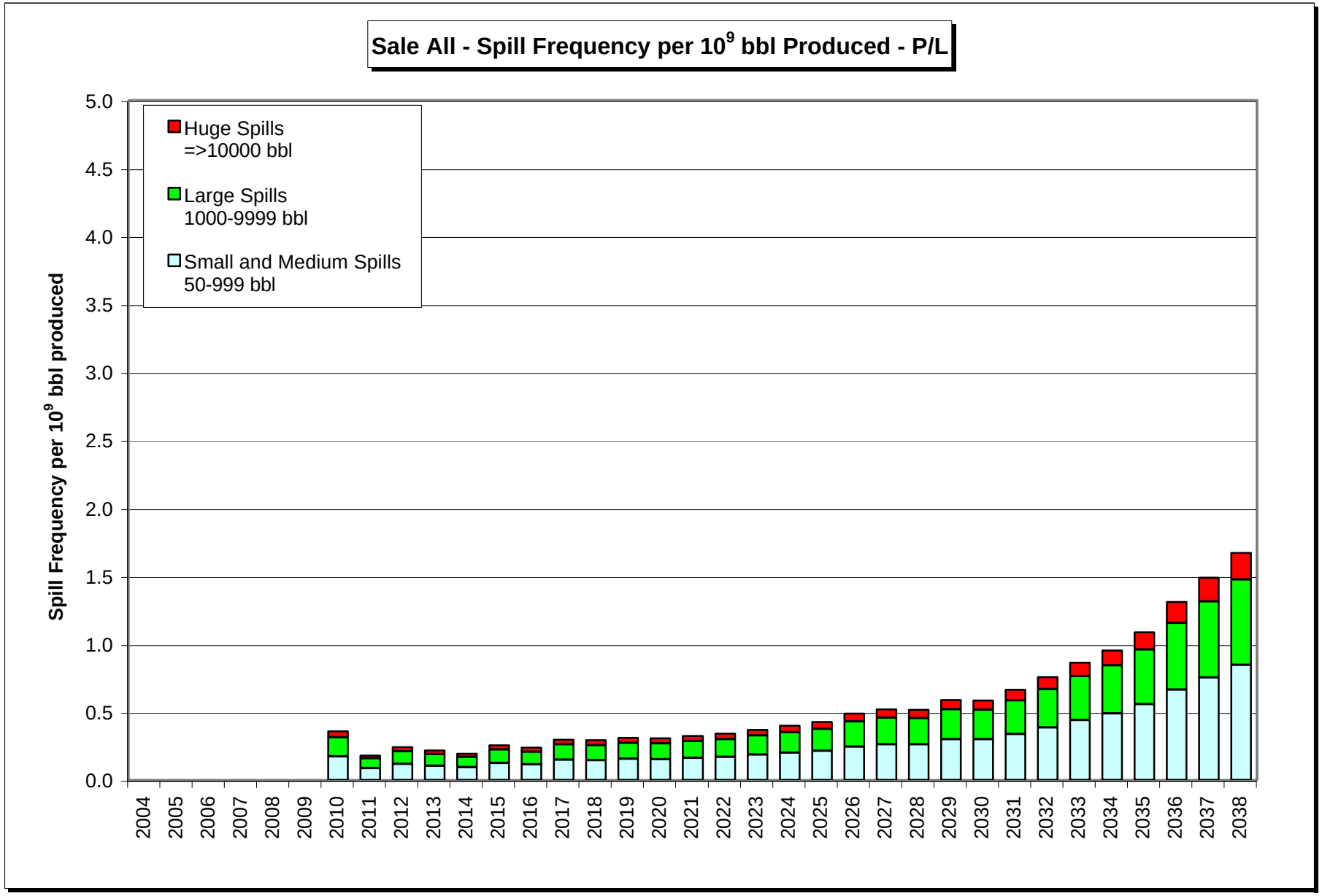
2030
2031
2032
2033
2034
2035
2036
2037
2038


Sale All - Spill Frequency per 10^9 bbl Produced - P/L
Huge Spills
=>10000 bbl
Large Spills
1000-9999 bbl
Small and Medium Spills
50-999 bbl
Spill Frequency per 10^9 bbl produced
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
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2031
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2033
2034
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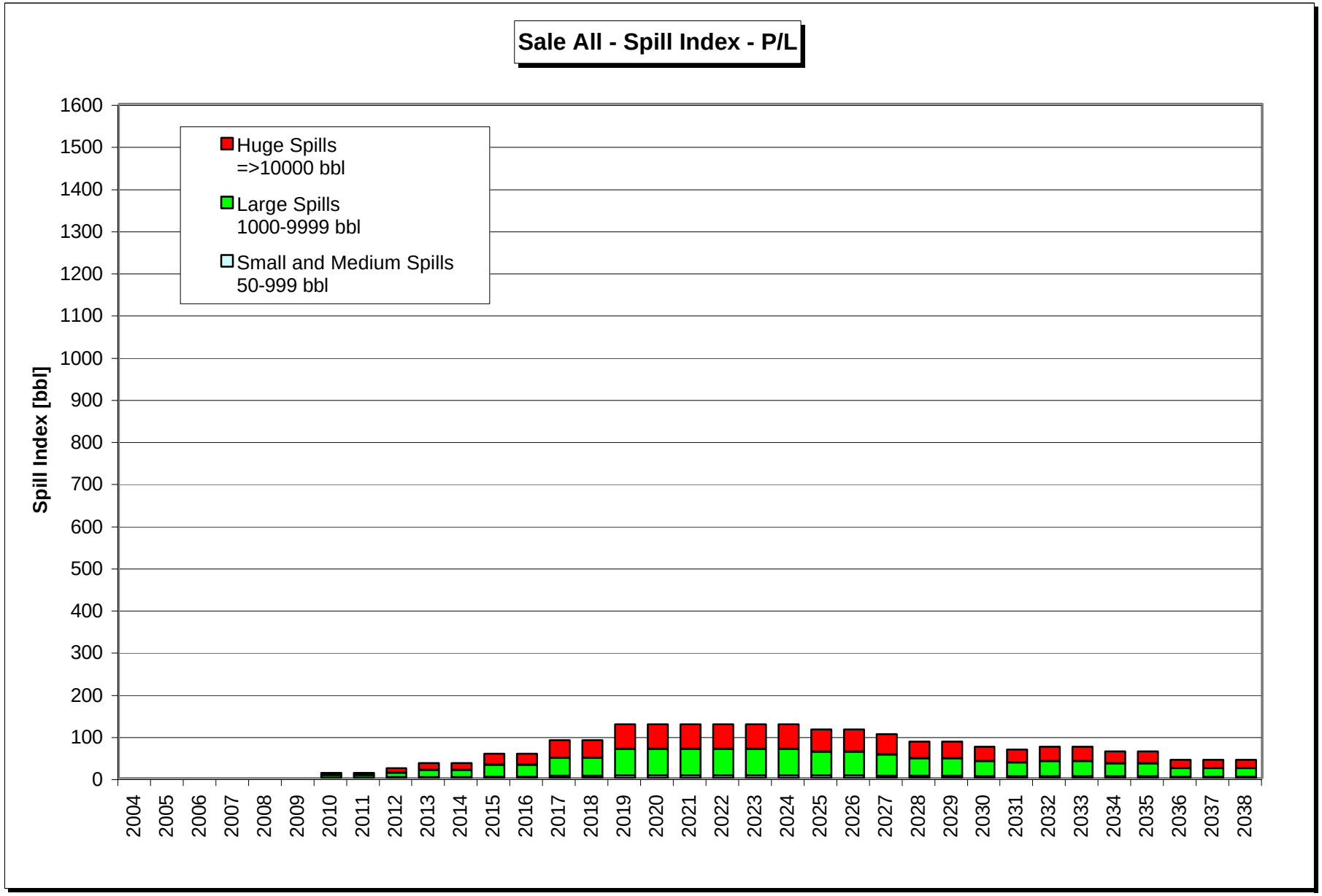
2036
2037
2038


Sale All - Spill Index - P/L
Huge Spills
=>10000 bbl
Large Spills
1000-9999 bbl
Small and Medium Spills
50-999 bbl
Spill Index [bbl]
1600
1500
1400
1300
1200
1100
1000
900
800
700
600
500
400
300
200
100
0
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
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2031
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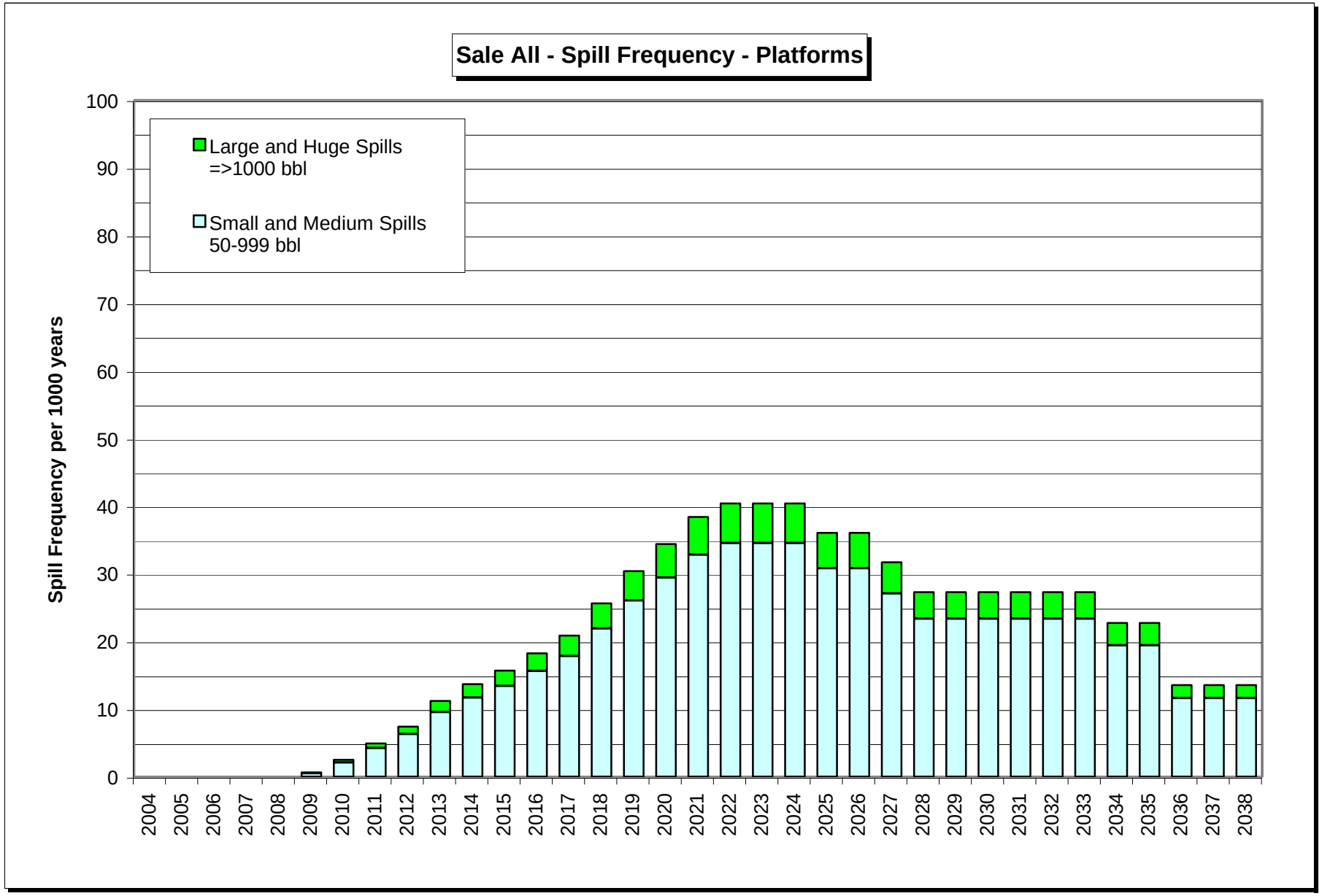
2033
2034
2035
2036
2037
2038


Sale All - Spill Frequency - Platforms
Large and Huge Spills =>1000 bbl
Small and Medium Spills 50-999 bbl
Spill Frequency per 1000 years
0
10
20
30
40
50
60
70
80
90
100
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
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2031
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2036
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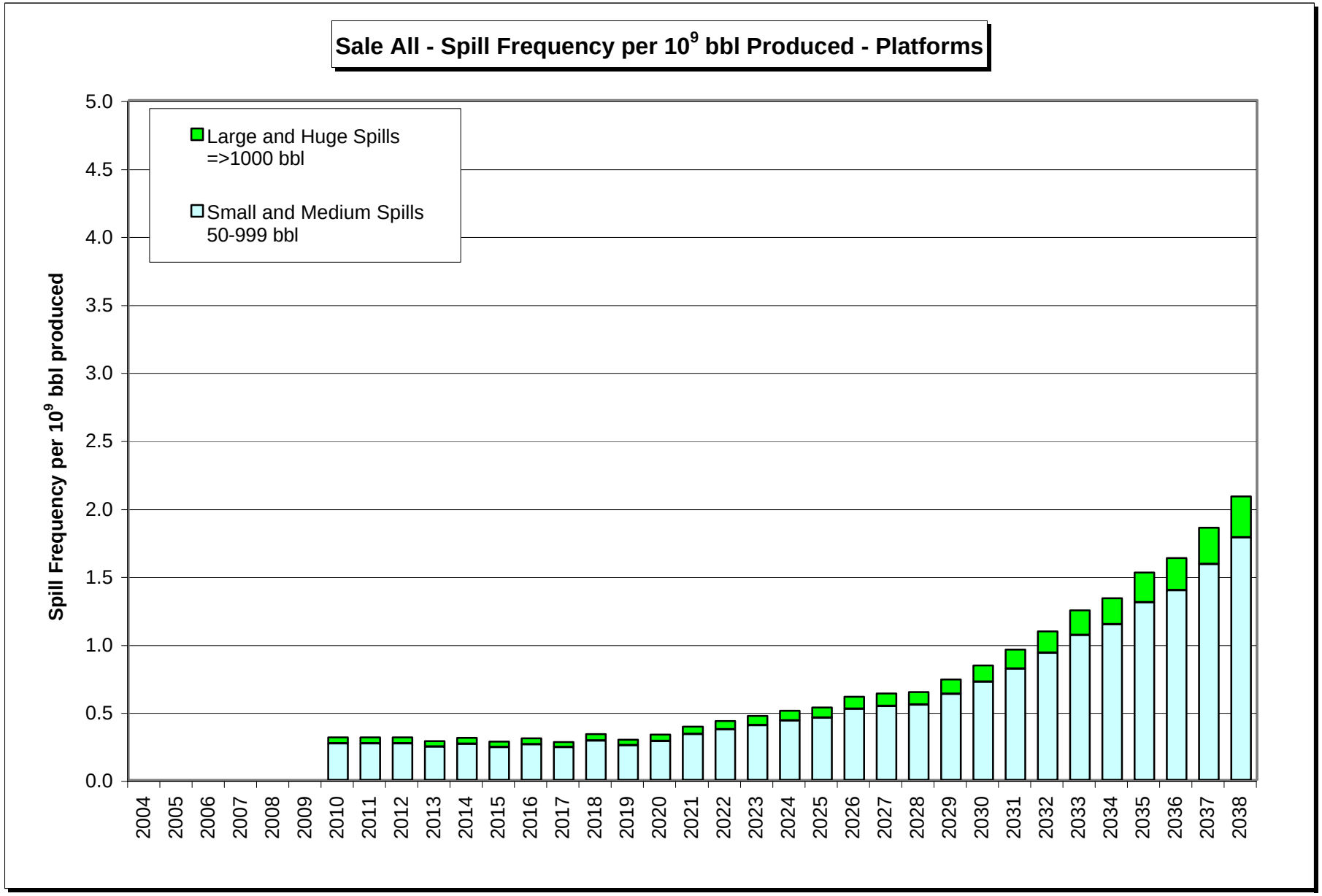
Sale All - Spill Frequency per 10^9 bbl Produced - Platforms
Large and Huge Spills =>1000 bbl
Small and Medium Spills 50-999 bbl
Spill Frequency per 10^9 bbl produced
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
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2027
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2031
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2033
2034
2035
2036
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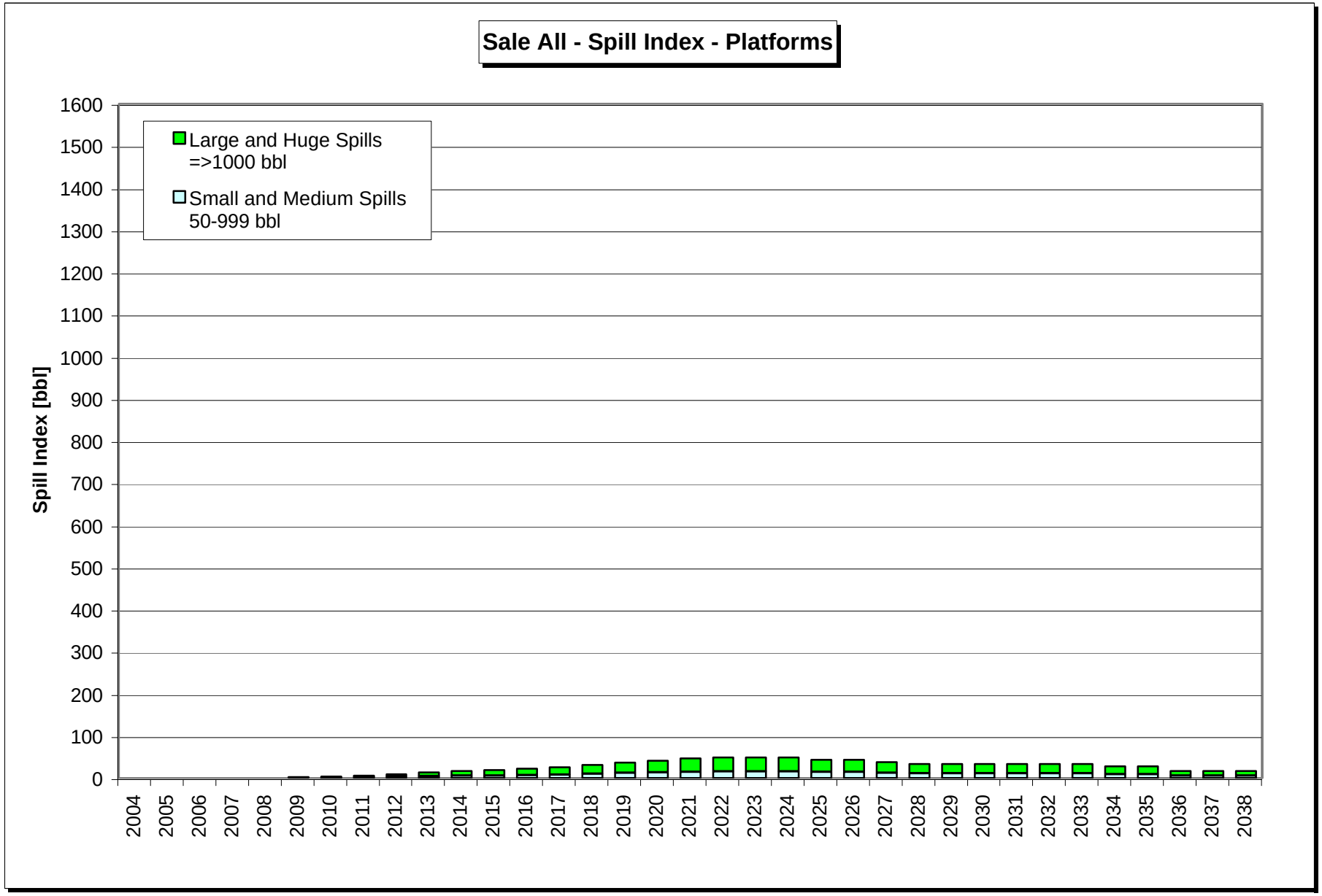
2038


Sale All - Spill Index - Platforms
Large and Huge Spills =>1000 bbl
Small and Medium Spills 50-999 bbl
Spill Index [bbl]
1600
1500
1400
1300
1200
1100
1000
900
800
700
600
500
400
300
200
100
0
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
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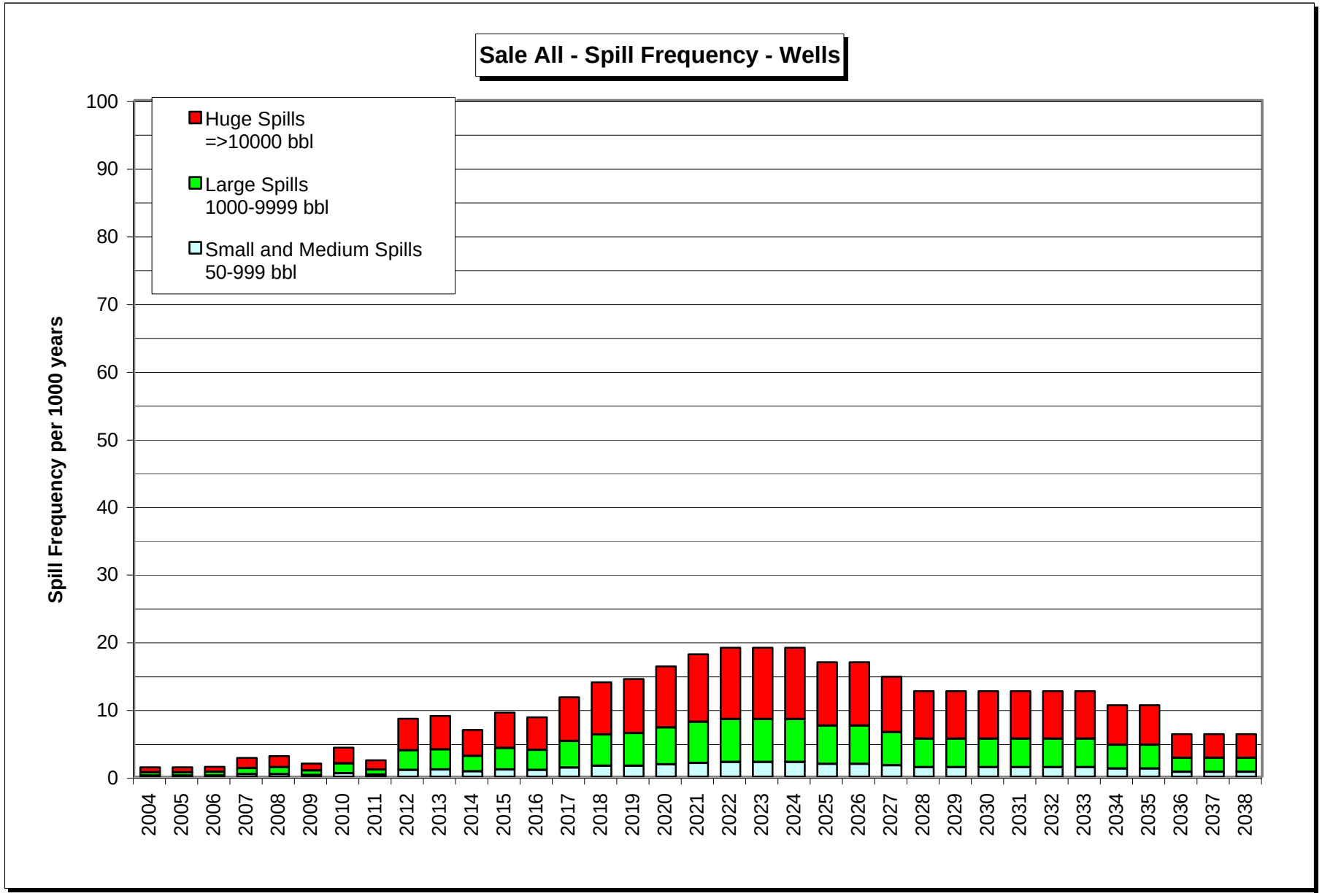
Sale All - Spill Frequency - Wells
Huge Spills
=>10000 bbl
Large Spills
1000-9999 bbl
Small and Medium Spills
50-999 bbl
Spill Frequency per 1000 years
0
10
20
30
40
50
60
70
80
90
100
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
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2016
2017
2018
2019
2020
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2023
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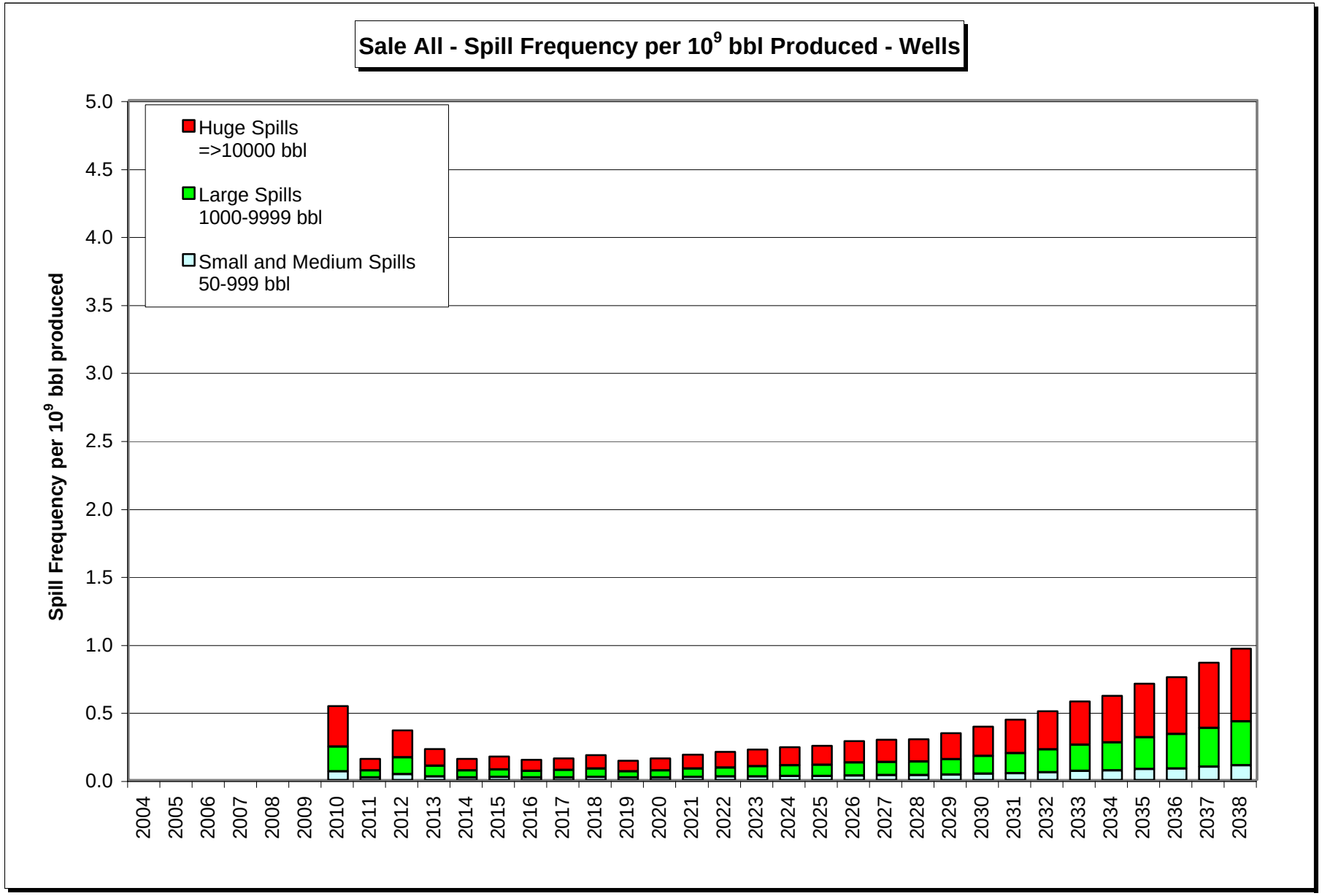
Sale All - Spill Frequency per 10^9 bbl Produced - Wells
Huge Spills
=>10000 bbl
Large Spills
1000-9999 bbl
Small and Medium Spills
50-999 bbl
Spill Frequency per 10^9 bbl produced
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
2004
2005
2006
2007
2008
2009
2010
2011
2012
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2017
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2020
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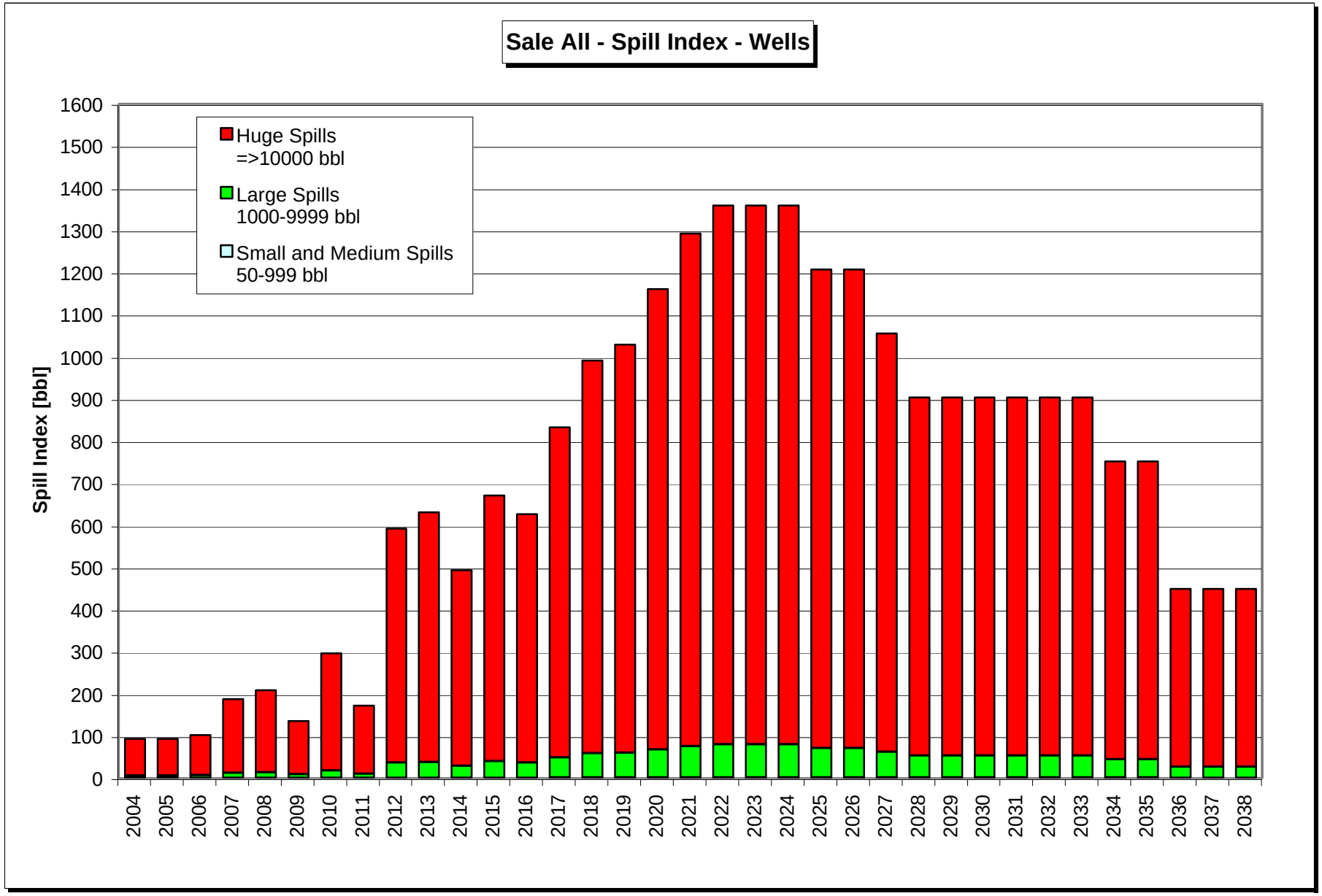
2038


Sale All - Spill Index - Wells
Huge Spills
=>10000 bbl
Large Spills
1000-9999 bbl
Small and Medium Spills
50-999 bbl
Spill Index [bbl]
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
1400
1500
1600
2004
2005
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2009
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2015
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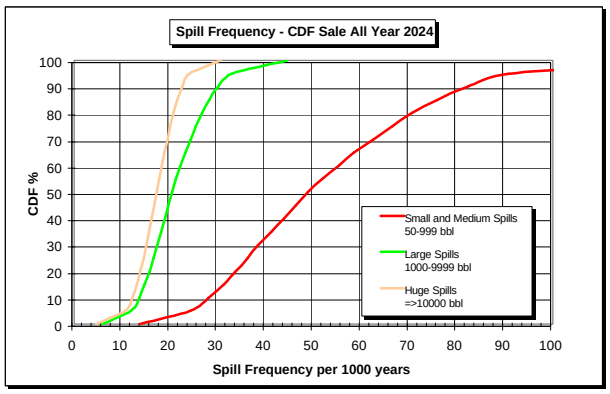
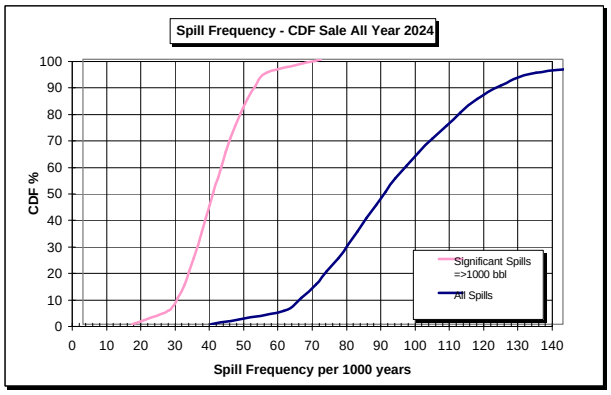
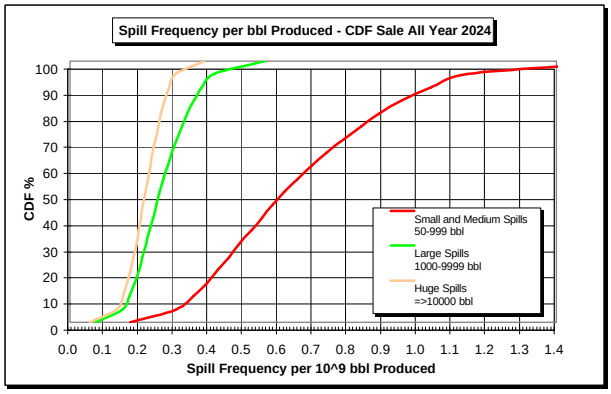
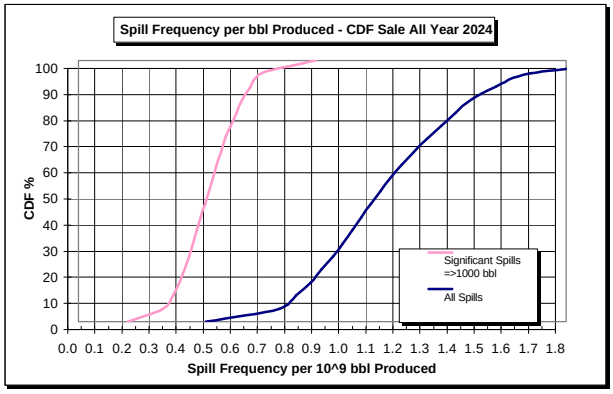
2038

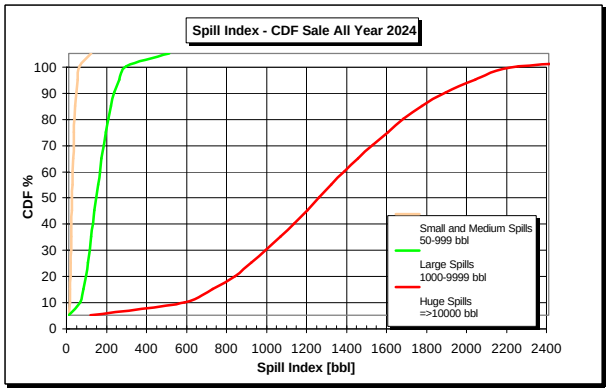
Figure 4.4.13 Spill Indicators - CDF - Year 2024











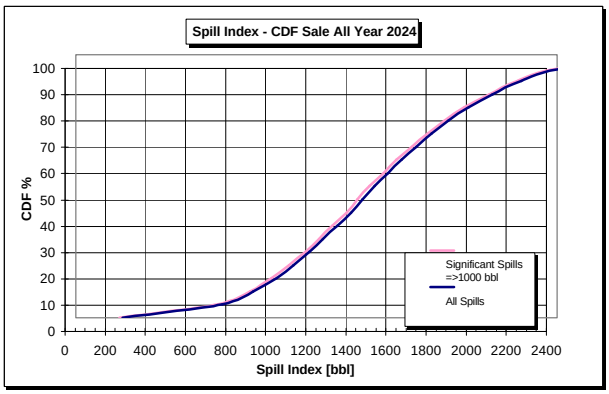


Figure 4.4.14 Spill Frequency - CDF - Sale All

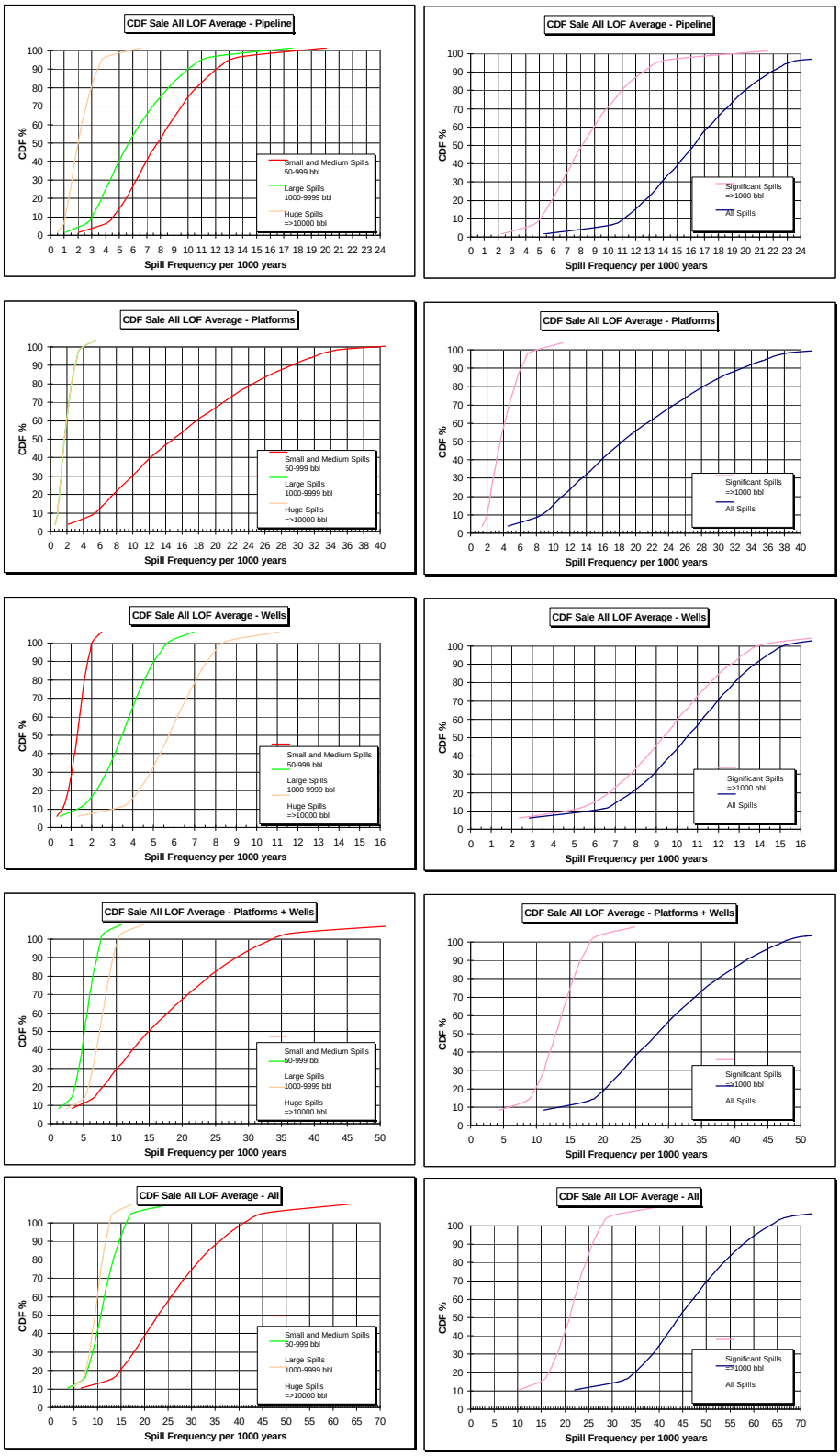


Figure 4.4.15 Spill Frequency per bbl produced - CDF - Sale All

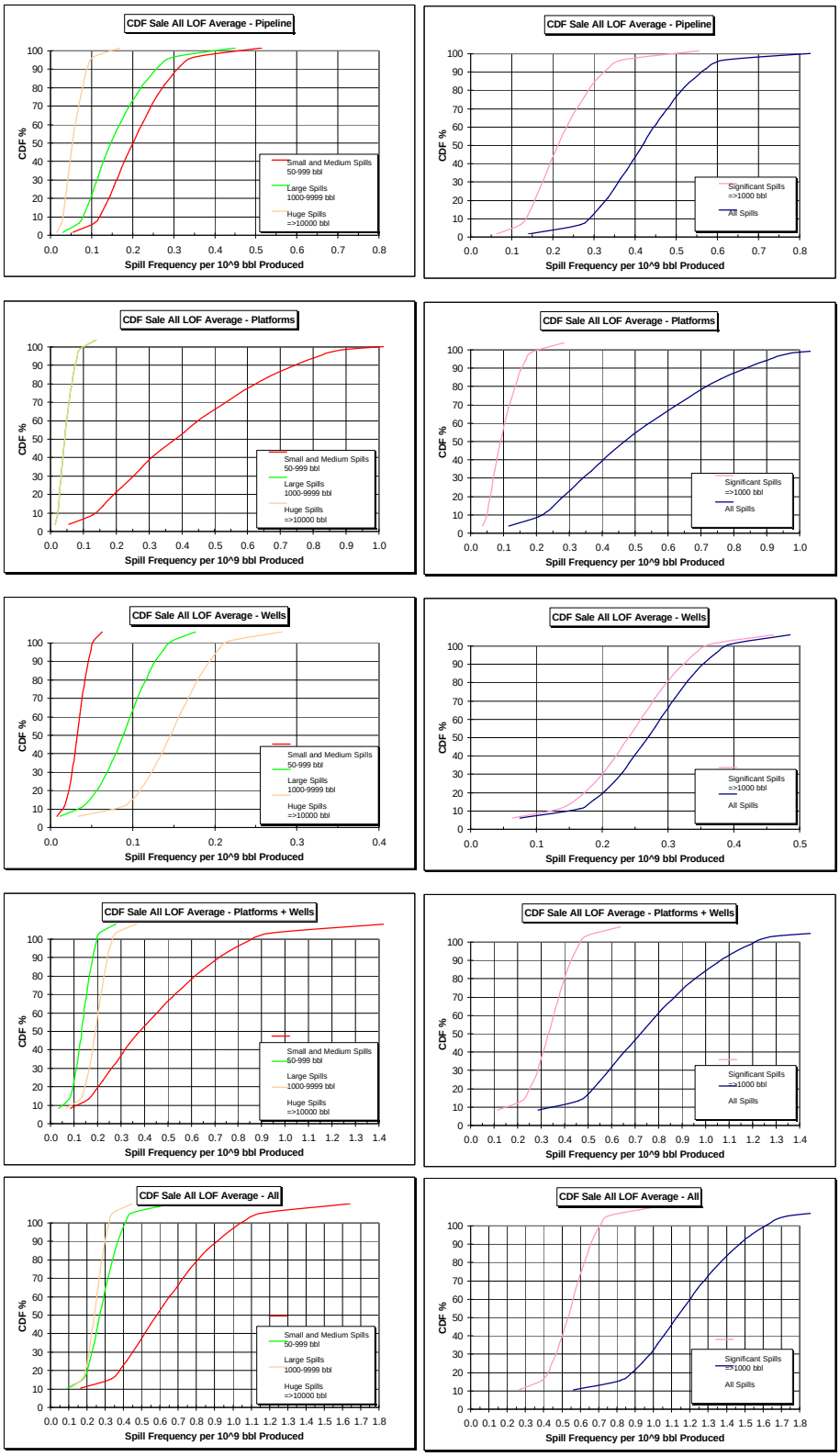


Figure 4.4.16 Spill Index [bbl] - CDF - Sale All

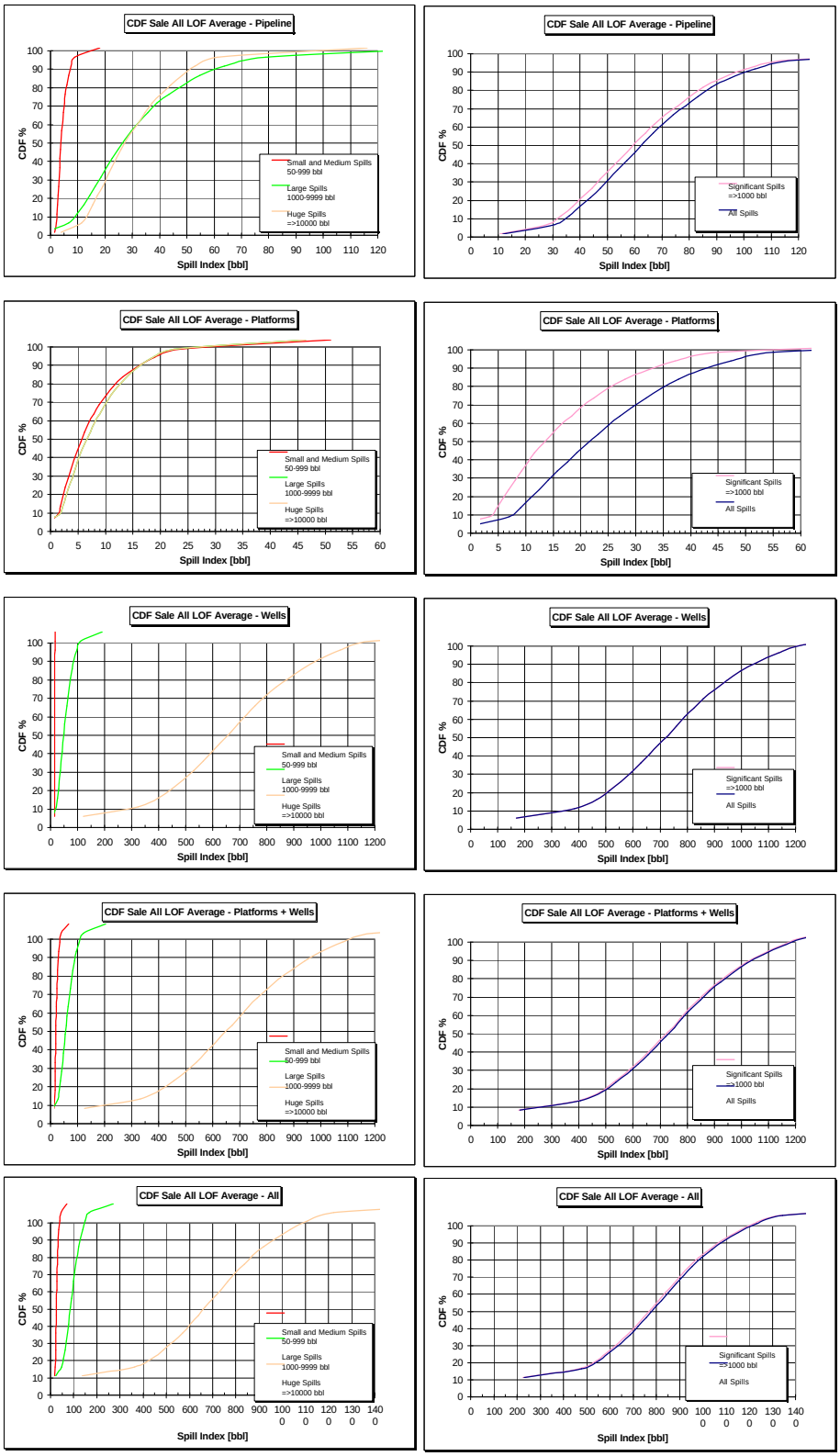
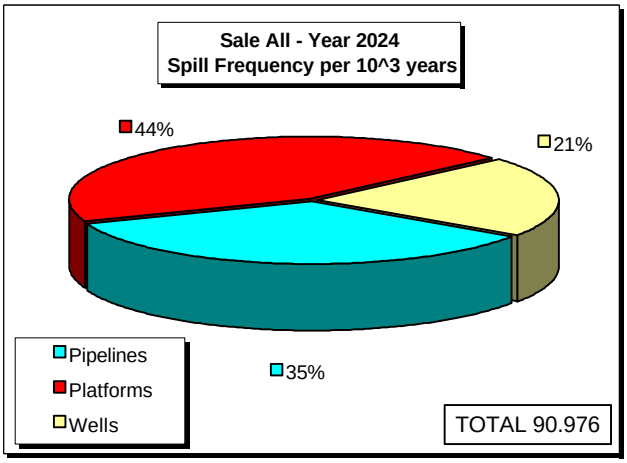
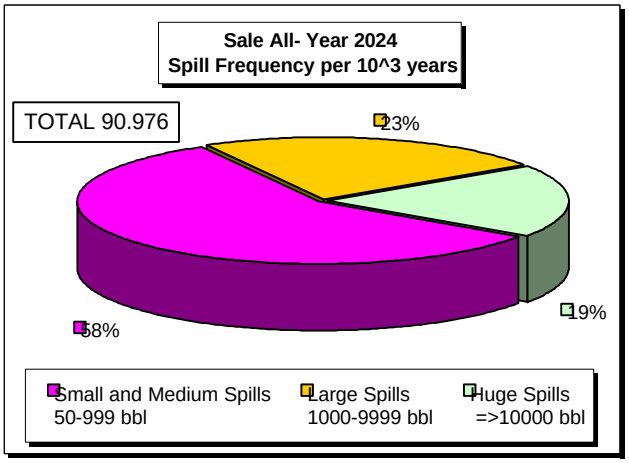


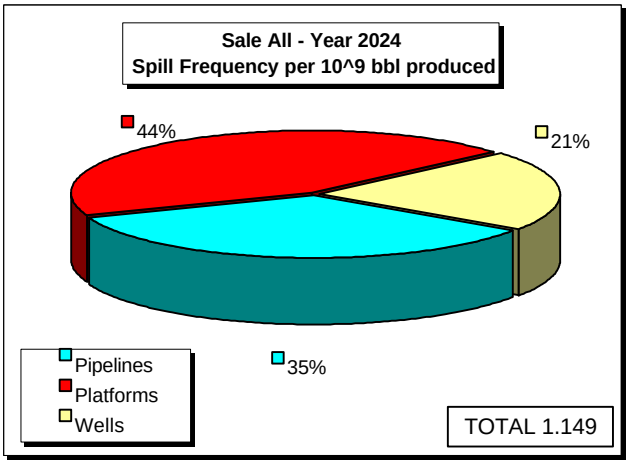
Figure 4.4.17
Sale All - Year 2024 - Spill Indicators

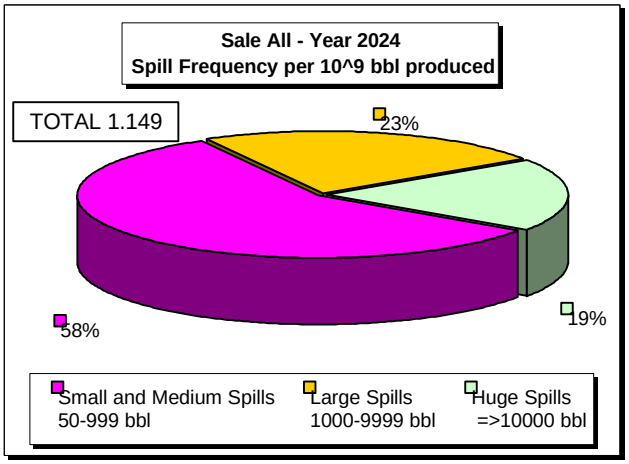
BY SPILL SOURCE

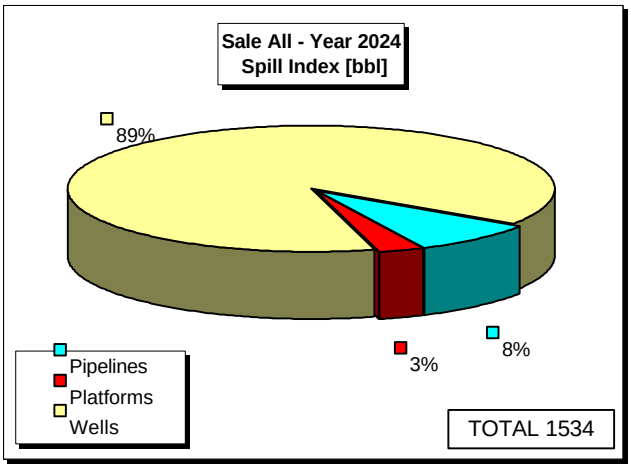


BY SPILL SIZE









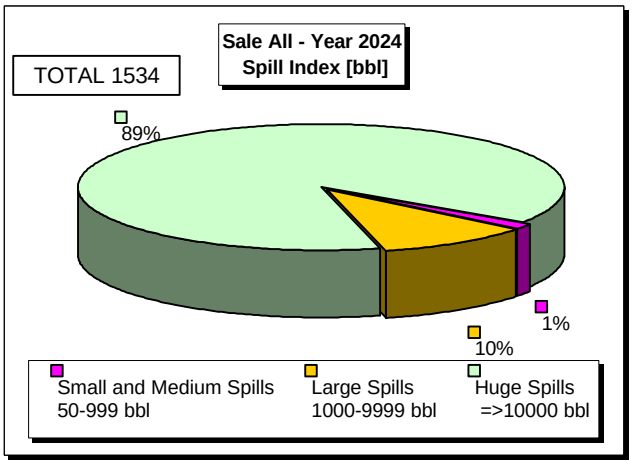
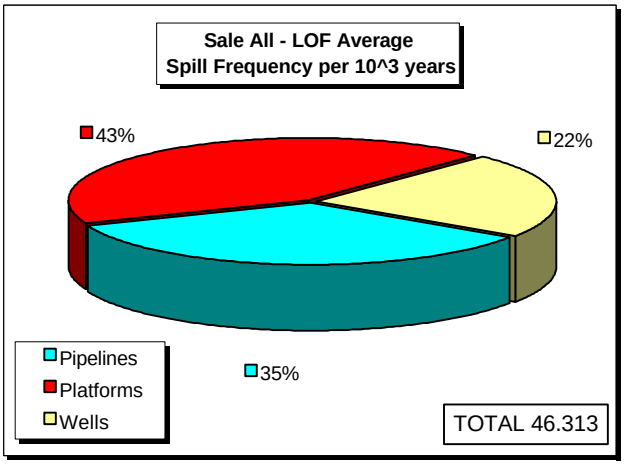
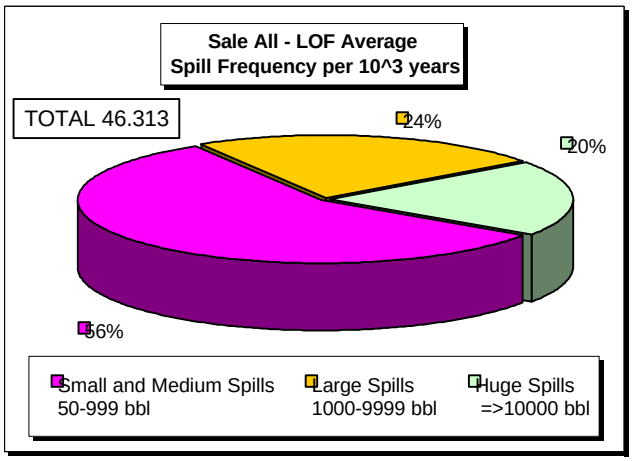


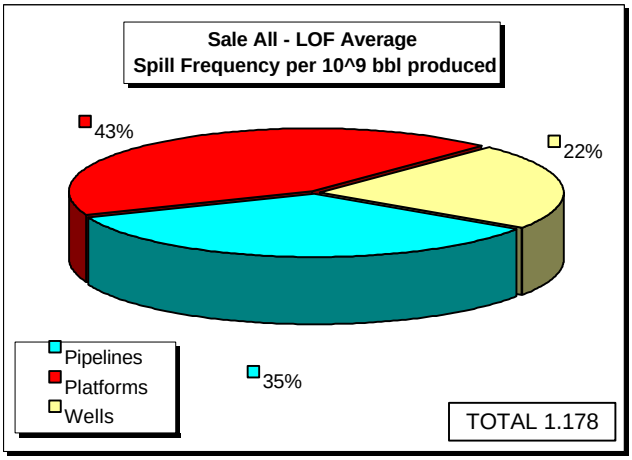
Figure 4.4.18
Sale All - LOF Average Spill Indicators

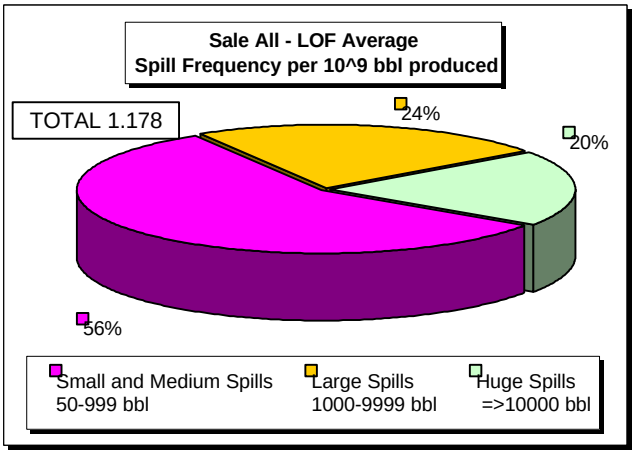
BY SPILL SOURCE

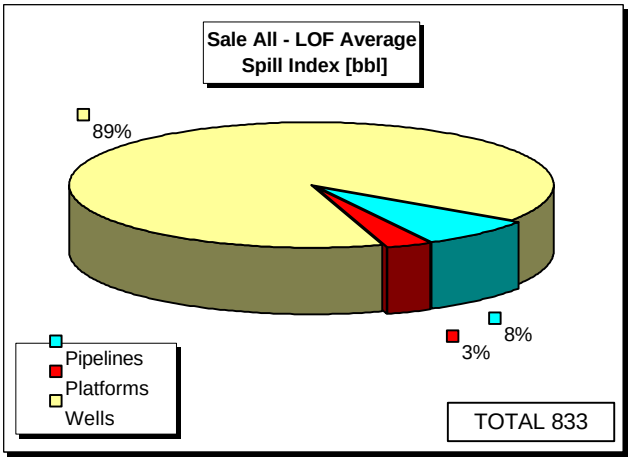


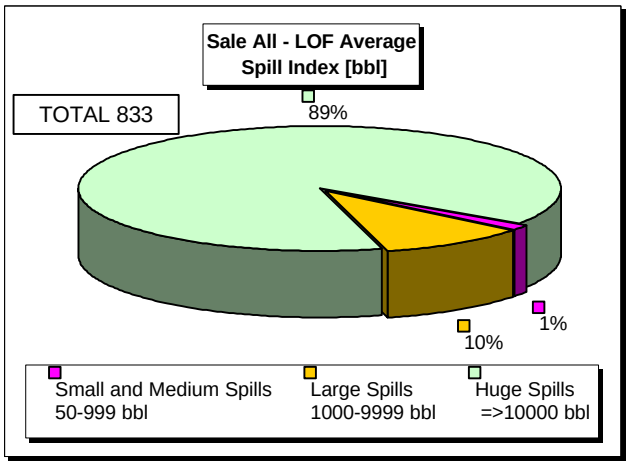
BY SPILL SIZE











APPENDIX 4
Spill Occurrence

4.5
Arctic Spill Occurrence
Beaufort Sea Sale All non Arctic

Table 4.5.1
Spill Occurrence Beaufort Sea Sale All non ArcticP/L Spills

Year	Water Depth	P/L Dia <10"													P/L Dia >= 10"												
		P/L [miles]	Small Spills 50-99 bbl			Medium Spills 100-999 bbl			Large Spills 1000-9999 bbl			Huge Spills =>10000 bbl			P/L [miles]	Small Spills 50-99 bbl			Medium Spills 100-999 bbl			Large Spills 1000-9999 bbl			Huge Spills =>10000 bbl		
			Expected Spill [bbl] =		71	Expected Spill [bbl] =		485	Expected Spill [bbl] =		5279	Expected Spill [bbl] =		14880		Expected Spill [bbl] =		71	Expected Spill [bbl] =		516	Expected Spill [bbl] =		5176	Expected Spill [bbl] =		15552
		Cumm.	Frequency spills per 10^5km-year	Frequency spills per 10^2years	Spill Index bbl	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl	Cumm.	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl
2004	Shallow		5.172			9.051			5.172			1.293				8.320			8.320			9.985			3.328		
	Medium		5.172			9.051			5.172			1.293				8.320			8.320			9.985			3.328		
	Deep		5.172			9.051			5.172			1.293				8.320			8.320			9.985			3.328		
	Total																										
2005	Shallow		5.172			9.051			5.172			1.293				8.320			8.320			9.985			3.328		
	Medium		5.172			9.051			5.172			1.293				8.320			8.320			9.985			3.328		
	Deep		5.172			9.051			5.172			1.293				8.320			8.320			9.985			3.328		
	Total																										
2006	Shallow		5.172			9.051			5.172			1.293				8.320			8.320			9.985			3.328		
	Medium		5.172			9.051			5.172			1.293				8.320			8.320			9.985			3.328		
	Deep		5.172			9.051			5.172			1.293				8.320			8.320			9.985			3.328		
	Total																										
2007	Shallow		5.172			9.051			5.172			1.293				8.320			8.320			9.985			3.328		
	Medium		5.172			9.051			5.172			1.293				8.320			8.320			9.985			3.328		
	Deep		5.172			9.051			5.172			1.293				8.320			8.320			9.985			3.328		
	Total																										
2008	Shallow		5.172			9.051			5.172			1.293				8.320			8.320			9.985			3.328		
	Medium		5.172			9.051			5.172			1.293				8.320			8.320			9.985			3.328		
	Deep		5.172			9.051			5.172			1.293				8.320			8.320			9.985			3.328		
	Total																										
2009	Shallow		5.172			9.051			5.172			1.293				8.320			8.320			9.985			3.328		
	Medium		5.172			9.051			5.172			1.293				8.320			8.320			9.985			3.328		
	Deep		5.172			9.051			5.172			1.293				8.320			8.320			9.985			3.328		
	Total																										
2010	Shallow		5.172			9.051			5.172			1.293			10	8.320	1.339	0.10	8.320	1.339	0.69	9.985	1.607	8.31	3.328	0.536	8.33
	Medium		5.172			9.051			5.172			1.293				8.320			8.320			9.985			3.328		
	Deep		5.172			9.051			5.172			1.293				8.320			8.320			9.985			3.328		
	Total														**10**		**1.339**	**0.10**		**1.339**	**0.69**		**1.607**	**8.31**		**0.536**	**8.33**
2011	Shallow		5.172			9.051			5.172			1.293			10	8.320	1.339	0.10	8.320	1.339	0.69	9.985	1.607	8.31	3.328	0.536	8.33
	Medium		5.172			9.051			5.172			1.293				8.320			8.320			9.985			3.328		
	Deep		5.172			9.051			5.172			1.293				8.320			8.320			9.985			3.328		
	Total														**10**		**1.339**	**0.10**		**1.339**	**0.69**		**1.607**	**8.31**		**0.536**	**8.33**
2012	Shallow		5.172			9.051			5.172			1.293			20	8.320	2.678	0.19	8.320	2.678	1.38	9.985	3.213	16.63	3.328	1.071	16.66
	Medium		5.172			9.051			5.172			1.293				8.320			8.320			9.985			3.328		
	Deep		5.172			9.051			5.172			1.293				8.320			8.320			9.985			3.328		
	Total														**20**		**2.678**	**0.19**		**2.678**	**1.38**		**3.213**	**16.63**		**1.071**	**16.66**
2013	Shallow		5.172			9.051			5.172			1.293			30	8.320	4.016	0.29	8.320	4.016	2.07	9.985	4.820	24.94	3.328	1.607	24.98
	Medium		5.172			9.051			5.172			1.293				8.320			8.320			9.985			3.328		
	Deep		5.172			9.051			5.172			1.293				8.320			8.320			9.985			3.328		
	Total														**30**		**4.016**	**0.29**		**4.016**	**2.07**		**4.820**	**24.94**		**1.607**	**24.98**
2014	Shallow		5.172			9.051			5.172			1.293			30	8.320	4.016	0.29	8.320	4.016	2.07	9.985	4.820	24.94	3.328	1.607	24.98
	Medium		5.172			9.051			5.172			1.293				8.320			8.320			9.985			3.328		
	Deep		5.172			9.051			5.172			1.293				8.320			8.320			9.985			3.328		
	Total														**30**		**4.016**	**0.29**		**4.016**	**2.07**		**4.820**	**24.94**		**1.607**	**24.98**
2015	Shallow		5.172			9.051			5.172			1.293			40	8.320	5.355	0.38	8.320	5.355	2.76	9.985	6.426	33.26	3.328	2.142	33.31
	Medium		5.172			9.051			5.172			1.293			10	8.320	1.339	0.10	8.320	1.339	0.69	9.985	1.607	8.31	3.328	0.536	8.33
	Deep		5.172			9.051			5.172			1.293				8.320			8.320			9.985			3.328		
	Total														**50**		**6.694**	**0.48**		**6.694**	**3.45**		**8.033**	**41.57**		**2.678**	**41.64**
2016	Shallow		5.172			9.051			5.172			1.293			40	8.320	5.355	0.38	8.320	5.355	2.76	9.985	6.426	33.26	3.328	2.142	33.31
	Medium		5.172			9.051			5.172			1.293			10	8.320	1.339	0.10	8.320	1.339	0.69	9.985	1.607	8.31	3.328	0.536	8.33
	Deep		5.172			9.051			5.172			1.293				8.320			8.320			9.985			3.328		
	Total														**50**		**6.694**	**0.48**		**6.694**	**3.45**		**8.033**	**41.57**		**2.678**	**41.64**
2017	Shallow		5.172			9.051			5.172			1.293			50	8.320	6.694	0.48	8.320	6.694	3.45	9.985	8.033	41.57	3.328	2.678	41.64
	Medium	5	5.172	0.416	0.03	9.051	0.728	0.35	5.172	0.416	2.20	1.293	0.104	1.55	25	8.320	3.347	0.24	8.320	3.347	1.73	9.985	4.016	20.79	3.328	1.339	20.82
	Deep		5.172			9.051			5.172			1.293				8.320			8.320			9.985			3.328		
	Total	**5**		**0.416**	**0.03**		**0.728**	**0.35**		**0.416**	**2.20**		**0.104**	**1.55**	**75**		**10.041**	**0.71**		**10.041**	**5.18**		**12.049**	**62.36**		**4.016**	**62.46**
2018	Shallow		5.172			9.051			5.172			1.293			50	8.320	6.694	0.48	8.320	6.694	3.45	9.985	8.033	41.57	3.328	2.678	41.64
	Medium	5	5.172	0.416	0.03	9.051	0.728	0.35	5.172	0.416	2.20	1.293	0.104	1.55	25	8.320	3.347	0.24	8.320	3.347	1.73	9.985	4.016	20.79	3.328	1.339	20.82
	Deep		5.172			9.051			5.172			1.293				8.320			8.320			9.985			3.328		
	Total	**5**		**0.416**	**0.03**		**0.728**	**0.35**		**0.416**	**2.20**		**0.104**	**1.55**	**75**		**10.041**	**0.71**		**10.041**	**5.18**		**12.049**	**62.36**		**4.016**	**62.46**
2019	Shallow		5.172			9.051			5.172			1.293			65	8.320	8.702	0.62	8.320	8.702	4.49	9.985	10.442	54.05	3.328	3.481	54.13
	Medium	10	5.172	0.832	0.06	9.051	1.456	0.71	5.172	0.832	4.39	1.293	0.208	3.10	40	8.320	5.355	0.38	8.320	5.355	2.76	9.985	6.426	33.26	3.328	2.142	33.31
	Deep		5.172			9.051			5.172			1.293				8.320			8.320			9.985			3.328		
	Total	**10**		**0.832**	**0.06**		**1.456**	**0.71**		**0.832**	**4.39**		**0.208**	**3.10**	**105**		**14.057**	**1.00**		**14.057**	**7.25**		**16.868**	**87.31**		**5.623**	**87.45**
2020	Shallow		5.172			9.051			5.172			1.293			65	8.320	8.702	0.62	8.320	8.702	4.49	9.985	10.442	54.05	3.328	3.481	54.13
	Medium	10	5.172	0.832	0.06	9.051	1.456	0.71	5.172	0.832	4.39	1.293	0.208	3.10	40	8.320	5.355	0.38	8.320	5.355	2.76	9.985	6.426	33.26	3.328	2.142	33.31
	Deep		5.172			9.051			5.172			1.293				8.320			8.320			9.985			3.328		
	Total	**10**		**0.832**	**0.06**		**1.456**	**0.71**		**0.832**	**4.39**		**0.208**	**3.10**	**105**		**14.057**	**1.00**		**14.057**	**7.25**		**16.868**	**87.31**		**5.623**	**87.45**
2021	Shallow		5.172			9.051			5.172			1.293			65	8.320	8.702	0.62	8.320	8.702	4.49	9.985	10.442	54.05	3.328	3.481	54.13
	Medium	10	5.172	0.832	0.06	9.051	1.456	0.71	5.172	0.832	4.39	1.293	0.208	3.10	40	8.320	5.355	0.38	8.320	5.355	2.76	9.985	6.426	33.26	3.328	2.142	33.31
	Deep		5.172			9.051			5.172			1.293				8.320			8.320			9.985			3.328		
	Total	**10**		**0.832**	**0.06**		**1.456**	**0.71**		**0.832**	**4.39**		**0.208**	**3.10**	**105**		**14.057**	**1.00**		**14.057**	**7.25**		**16.868**	**87.31**		**5.623**	**87.45**
2022	Shallow		5.172			9.051			5.172			1.293			65	8.320	8.702	0.62	8.320	8.702	4.49	9.985	10.442	54.05	3.328	3.481	54.13
	Medium	10	5.172	0.832	0.06	9.051	1.456	0.71	5.172	0.832	4.39	1.293	0.208	3.10	40	8.320	5.355	0.38	8.320	5.355	2.76	9.985	6.426	33.26	3.328	2.142	33.31
	Deep		5.172			9.051			5.172			1.293				8.320			8.320			9.985			3.328		
	Total	**10**		**0.832**	**0.06**		**1.456**	**0.71**		**0.832**	**4.39**		**0.208**	**3.10**	**105**		**14.057**	**1.00**		**14.057**	**7.25**		**16.868**	**87.31**		**5.623**	**87.45**
2023	Shallow		5.172			9.051			5.172			1.293			65	8.320	8.702	0.62	8.320	8.702	4.49	9.985	10.442	54.05	3.328	3.481	54.13
	Medium	10	5.172	0.832	0.06	9.051	1.456	0.71	5.172	0.832	4.39	1.293	0.208	3.10	40	8.320	5.355	0.38	8.320	5.355	2.76	9.985	6.426	33.26	3.328	2.142	33.31
	Deep		5.172			9.051			5.172			1.293				8.320			8.320			9.985			3.328		

Table 4.5.1
Spill Occurrence Beaufort Sea Sale All non ArcticP/L Spills

Year	Water Depth	P/L Dia <10"													P/L Dia >= 10"												
		P/L [miles]	Small Spills 50-99 bbl			Medium Spills 100-999 bbl			Large Spills 1000-9999 bbl			Huge Spills =>10000 bbl			P/L [miles]	Small Spills 50-99 bbl			Medium Spills 100-999 bbl			Large Spills 1000-9999 bbl			Huge Spills =>10000 bbl		
			Expected Spill [bbl] =		71	Expected Spill [bbl] =		485	Expected Spill [bbl] =		5279	Expected Spill [bbl] =		14880		Expected Spill [bbl] =		71	Expected Spill [bbl] =		516	Expected Spill [bbl] =		5176	Expected Spill [bbl] =		15552
		Cumm.	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl	Cumm.	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^5km-year	Frequency spills per 10^3years	Spill Index bbl
	Total	**10**		**0.832**	**0.06**		**1.456**	**0.71**		**0.832**	**4.39**		**0.208**	**3.10**	**105**		**14.057**	**1.00**		**14.057**	**7.25**		**16.868**	**87.31**		**5.623**	**87.45**
2024	Shallow		5.172			9.051			5.172			1.293			65	8.320	8.702	0.62	8.320	8.702	4.49	9.985	10.442	54.05	3.328	3.481	54.13
	Medium	10	5.172	0.832	0.06	9.051	1.456	0.71	5.172	0.832	4.39	1.293	0.208	3.10	40	8.320	5.355	0.38	8.320	5.355	2.76	9.985	6.426	33.26	3.328	2.142	33.31
	Deep		5.172			9.051			5.172			1.293				8.320			8.320			9.985			3.328		
	Total	**10**		**0.832**	**0.06**		**1.456**	**0.71**		**0.832**	**4.39**		**0.208**	**3.10**	**105**		**14.057**	**1.00**		**14.057**	**7.25**		**16.868**	**87.31**		**5.623**	**87.45**
2025	Shallow		5.172			9.051			5.172			1.293			55	8.320	7.363	0.52	8.320	7.363	3.80	9.985	8.836	45.73	3.328	2.945	45.80
	Medium	10	5.172	0.832	0.06	9.051	1.456	0.71	5.172	0.832	4.39	1.293	0.208	3.10	40	8.320	5.355	0.38	8.320	5.355	2.76	9.985	6.426	33.26	3.328	2.142	33.31
	Deep		5.172			9.051			5.172			1.293				8.320			8.320			9.985			3.328		
	Total	**10**		**0.832**	**0.06**		**1.456**	**0.71**		**0.832**	**4.39**		**0.208**	**3.10**	**95**		**12.718**	**0.91**		**12.718**	**6.56**		**15.262**	**78.99**		**5.087**	**79.12**
2026	Shallow		5.172			9.051			5.172			1.293			55	8.320	7.363	0.52	8.320	7.363	3.80	9.985	8.836	45.73	3.328	2.945	45.80
	Medium	10	5.172	0.832	0.06	9.051	1.456	0.71	5.172	0.832	4.39	1.293	0.208	3.10	40	8.320	5.355	0.38	8.320	5.355	2.76	9.985	6.426	33.26	3.328	2.142	33.31
	Deep		5.172			9.051			5.172			1.293				8.320			8.320			9.985			3.328		
	Total	**10**		**0.832**	**0.06**		**1.456**	**0.71**		**0.832**	**4.39**		**0.208**	**3.10**	**95**		**12.718**	**0.91**		**12.718**	**6.56**		**15.262**	**78.99**		**5.087**	**79.12**
2027	Shallow		5.172			9.051			5.172			1.293			45	8.320	6.024	0.43	8.320	6.024	3.11	9.985	7.229	37.42	3.328	2.410	37.48
	Medium	10	5.172	0.832	0.06	9.051	1.456	0.71	5.172	0.832	4.39	1.293	0.208	3.10	40	8.320	5.355	0.38	8.320	5.355	2.76	9.985	6.426	33.26	3.328	2.142	33.31
	Deep		5.172			9.051			5.172			1.293				8.320			8.320			9.985			3.328		
	Total	**10**		**0.832**	**0.06**		**1.456**	**0.71**		**0.832**	**4.39**		**0.208**	**3.10**	**85**		**11.380**	**0.81**		**11.380**	**5.87**		**13.655**	**70.68**		**4.552**	**70.79**
2028	Shallow		5.172			9.051			5.172			1.293			30	8.320	4.016	0.29	8.320	4.016	2.07	9.985	4.820	24.94	3.328	1.607	24.98
	Medium	10	5.172	0.832	0.06	9.051	1.456	0.71	5.172	0.832	4.39	1.293	0.208	3.10	40	8.320	5.355	0.38	8.320	5.355	2.76	9.985	6.426	33.26	3.328	2.142	33.31
	Deep		5.172			9.051			5.172			1.293				8.320			8.320			9.985			3.328		
	Total	**10**		**0.832**	**0.06**		**1.456**	**0.71**		**0.832**	**4.39**		**0.208**	**3.10**	**70**		**9.371**	**0.67**		**9.371**	**4.84**		**11.246**	**58.20**		**3.749**	**58.30**
2029	Shallow		5.172			9.051			5.172			1.293			30	8.320	4.016	0.29	8.320	4.016	2.07	9.985	4.820	24.94	3.328	1.607	24.98
	Medium	10	5.172	0.832	0.06	9.051	1.456	0.71	5.172	0.832	4.39	1.293	0.208	3.10	40	8.320	5.355	0.38	8.320	5.355	2.76	9.985	6.426	33.26	3.328	2.142	33.31
	Deep		5.172			9.051			5.172			1.293				8.320			8.320			9.985			3.328		
	Total	**10**		**0.832**	**0.06**		**1.456**	**0.71**		**0.832**	**4.39**		**0.208**	**3.10**	**70**		**9.371**	**0.67**		**9.371**	**4.84**		**11.246**	**58.20**		**3.749**	**58.30**
2030	Shallow		5.172			9.051			5.172			1.293			20	8.320	2.678	0.19	8.320	2.678	1.38	9.985	3.213	16.63	3.328	1.071	16.66
	Medium	10	5.172	0.832	0.06	9.051	1.456	0.71	5.172	0.832	4.39	1.293	0.208	3.10	40	8.320	5.355	0.38	8.320	5.355	2.76	9.985	6.426	33.26	3.328	2.142	33.31
	Deep		5.172			9.051			5.172			1.293				8.320			8.320			9.985			3.328		
	Total	**10**		**0.832**	**0.06**		**1.456**	**0.71**		**0.832**	**4.39**		**0.208**	**3.10**	**60**		**8.033**	**0.57**		**8.033**	**4.14**		**9.639**	**49.89**		**3.213**	**49.97**
2031	Shallow		5.172			9.051			5.172			1.293			20	8.320	2.678	0.19	8.320	2.678	1.38	9.985	3.213	16.63	3.328	1.071	16.66
	Medium	10	5.172	0.832	0.06	9.051	1.456	0.71	5.172	0.832	4.39	1.293	0.208	3.10	40	8.320	5.355	0.38	8.320	5.355	2.76	9.985	6.426	33.26	3.328	2.142	33.31
	Deep		5.172			9.051			5.172			1.293				8.320			8.320			9.985			3.328		
	Total	**10**		**0.832**	**0.06**		**1.456**	**0.71**		**0.832**	**4.39**		**0.208**	**3.10**	**60**		**8.033**	**0.57**		**8.033**	**4.14**		**9.639**	**49.89**		**3.213**	**49.97**
2032	Shallow		5.172			9.051			5.172			1.293			20	8.320	2.678	0.19	8.320	2.678	1.38	9.985	3.213	16.63	3.328	1.071	16.66
	Medium	10	5.172	0.832	0.06	9.051	1.456	0.71	5.172	0.832	4.39	1.293	0.208	3.10	40	8.320	5.355	0.38	8.320	5.355	2.76	9.985	6.426	33.26	3.328	2.142	33.31
	Deep		5.172			9.051			5.172			1.293				8.320			8.320			9.985			3.328		
	Total	**10**		**0.832**	**0.06**		**1.456**	**0.71**		**0.832**	**4.39**		**0.208**	**3.10**	**60**		**8.033**	**0.57**		**8.033**	**4.14**		**9.639**	**49.89**		**3.213**	**49.97**
2033	Shallow		5.172			9.051			5.172			1.293			20	8.320	2.678	0.19	8.320	2.678	1.38	9.985	3.213	16.63	3.328	1.071	16.66
	Medium	10	5.172	0.832	0.06	9.051	1.456	0.71	5.172	0.832	4.39	1.293	0.208	3.10	40	8.320	5.355	0.38	8.320	5.355	2.76	9.985	6.426	33.26	3.328	2.142	33.31
	Deep		5.172			9.051			5.172			1.293				8.320			8.320			9.985			3.328		
	Total	**10**		**0.832**	**0.06**		**1.456**	**0.71**		**0.832**	**4.39**		**0.208**	**3.10**	**60**		**8.033**	**0.57**		**8.033**	**4.14**		**9.639**	**49.89**		**3.213**	**49.97**
2034	Shallow		5.172			9.051			5.172			1.293			20	8.320	2.678	0.19	8.320	2.678	1.38	9.985	3.213	16.63	3.328	1.071	16.66
	Medium	10	5.172	0.832	0.06	9.051	1.456	0.71	5.172	0.832	4.39	1.293	0.208	3.10	30	8.320	4.016	0.29	8.320	4.016	2.07	9.985	4.820	24.94	3.328	1.607	24.98
	Deep		5.172			9.051			5.172			1.293				8.320			8.320			9.985			3.328		
	Total	**10**		**0.832**	**0.06**		**1.456**	**0.71**		**0.832**	**4.39**		**0.208**	**3.10**	**50**		**6.694**	**0.48**		**6.694**	**3.45**		**8.033**	**41.57**		**2.678**	**41.64**
2035	Shallow		5.172			9.051			5.172			1.293			20	8.320	2.678	0.19	8.320	2.678	1.38	9.985	3.213	16.63	3.328	1.071	16.66
	Medium	10	5.172	0.832	0.06	9.051	1.456	0.71	5.172	0.832	4.39	1.293	0.208	3.10	30	8.320	4.016	0.29	8.320	4.016	2.07	9.985	4.820	24.94	3.328	1.607	24.98
	Deep		5.172			9.051			5.172			1.293				8.320			8.320			9.985			3.328		
	Total	**10**		**0.832**	**0.06**		**1.456**	**0.71**		**0.832**	**4.39**		**0.208**	**3.10**	**50**		**6.694**	**0.48**		**6.694**	**3.45**		**8.033**	**41.57**		**2.678**	**41.64**
2036	Shallow		5.172			9.051			5.172			1.293			15	8.320	2.008	0.14	8.320	2.008	1.04	9.985	2.410	12.47	3.328	0.803	12.49
	Medium	5	5.172	0.416	0.03	9.051	0.728	0.35	5.172	0.416	2.20	1.293	0.104	1.55	20	8.320	2.678	0.19	8.320	2.678	1.38	9.985	3.213	16.63	3.328	1.071	16.66
	Deep		5.172			9.051			5.172			1.293				8.320			8.320			9.985			3.328		
	Total	**5**		**0.416**	**0.03**		**0.728**	**0.35**		**0.416**	**2.20**		**0.104**	**1.55**	**35**		**4.686**	**0.33**		**4.686**	**2.42**		**5.623**	**29.10**		**1.874**	**29.15**
2037	Shallow		5.172			9.051			5.172			1.293			15	8.320	2.008	0.14	8.320	2.008	1.04	9.985	2.410	12.47	3.328	0.803	12.49
	Medium	5	5.172	0.416	0.03	9.051	0.728	0.35	5.172	0.416	2.20	1.293	0.104	1.55	20	8.320	2.678	0.19	8.320	2.678	1.38	9.985	3.213	16.63	3.328	1.071	16.66
	Deep		5.172			9.051			5.172			1.293				8.320			8.320			9.985			3.328		
	Total	**5**		**0.416**	**0.03**		**0.728**	**0.35**		**0.416**	**2.20**		**0.104**	**1.55**	**35**		**4.686**	**0.33**		**4.686**	**2.42**		**5.623**	**29.10**		**1.874**	**29.15**
2038	Shallow		5.172			9.051			5.172			1.293			15	8.320	2.008	0.14	8.320	2.008	1.04	9.985	2.410	12.47	3.328	0.803	12.49
	Medium	5	5.172	0.416	0.03	9.051	0.728	0.35	5.172	0.416	2.20	1.293	0.104	1.55	20	8.320	2.678	0.19	8.320	2.678	1.38	9.985	3.213	16.63	3.328	1.071	16.66
	Deep		5.172			9.051			5.172			1.293				8.320			8.320			9.985			3.328		
	Total	**5**		**0.416**	**0.03**		**0.728**	**0.35**		**0.416**	**2.20**		**0.104**	**1.55**	**35**		**4.686**	**0.33**		**4.686**	**2.42**		**5.623**	**29.10**		**1.874**	**29.15**

Table 4.5.2
Spill Occurrence - Sale All non Arctic- P/L - Summary

Year	Production [MMbbl]	Small Spills 50-99 bbl			Medium Spills 100-999 bbl			Small and Medium Spills 50-999 bbl			Large Spills 1000-9999 bbl			Huge Spills =>10000 bbl			Significant Spills =>1000 bbl			All Spills		
		Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 103years	Frequency Spills per 109 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]
2004																						
2005																						
2006																						
2007																						
2008																						
2009																						
2010	7.9	1.339	0.169	0.095	1.339	0.169	0.691	2.678	0.339	0.786	1.607	0.203	8.315	0.536	0.068	8.328	2.142	0.271	16.643	4.820	0.610	17.429
2011	15.7	1.339	0.085	0.095	1.339	0.085	0.691	2.678	0.171	0.786	1.607	0.102	8.315	0.536	0.034	8.328	2.142	0.136	16.643	4.820	0.307	17.429
2012	23.6	2.678	0.113	0.191	2.678	0.113	1.381	5.355	0.227	1.572	3.213	0.136	16.630	1.071	0.045	16.656	4.284	0.182	33.286	9.639	0.408	34.858
2013	39.4	4.016	0.102	0.286	4.016	0.102	2.072	8.033	0.204	2.358	4.820	0.122	24.945	1.607	0.041	24.984	6.426	0.163	49.929	14.459	0.367	52.287
2014	44.4	4.016	0.090	0.286	4.016	0.090	2.072	8.033	0.181	2.358	4.820	0.109	24.945	1.607	0.036	24.984	6.426	0.145	49.929	14.459	0.326	52.287
2015	55.3	6.694	0.121	0.476	6.694	0.121	3.454	13.388	0.242	3.930	8.033	0.145	41.574	2.678	0.048	41.641	10.710	0.194	83.215	24.098	0.436	87.145
2016	59.5	6.694	0.113	0.476	6.694	0.113	3.454	13.388	0.225	3.930	8.033	0.135	41.574	2.678	0.045	41.641	10.710	0.180	83.215	24.098	0.405	87.145
2017	74.5	10.457	0.140	0.744	10.769	0.145	5.534	21.226	0.285	6.278	12.465	0.167	64.558	4.120	0.055	64.009	16.585	0.223	128.567	37.811	0.508	134.845
2018	76.1	10.457	0.137	0.744	10.769	0.142	5.534	21.226	0.279	6.278	12.465	0.164	64.558	4.120	0.054	64.009	16.585	0.218	128.567	37.811	0.497	134.845
2019	102.5	14.889	0.145	1.060	15.513	0.151	7.959	30.403	0.297	9.019	17.701	0.173	91.699	5.831	0.057	90.541	23.532	0.230	182.241	53.934	0.526	191.259
2020	103.5	14.889	0.144	1.060	15.513	0.150	7.959	30.403	0.294	9.019	17.701	0.171	91.699	5.831	0.056	90.541	23.532	0.227	182.241	53.934	0.521	191.259
2021	97.9	14.889	0.152	1.060	15.513	0.158	7.959	30.403	0.311	9.019	17.701	0.181	91.699	5.831	0.060	90.541	23.532	0.240	182.241	53.934	0.551	191.259
2022	93.1	14.889	0.160	1.060	15.513	0.167	7.959	30.403	0.327	9.019	17.701	0.190	91.699	5.831	0.063	90.541	23.532	0.253	182.241	53.934	0.579	191.259
2023	85.6	14.889	0.174	1.060	15.513	0.181	7.959	30.403	0.355	9.019	17.701	0.207	91.699	5.831	0.068	90.541	23.532	0.275	182.241	53.934	0.630	191.259
2024	79.2	14.889	0.188	1.060	15.513	0.196	7.959	30.403	0.384	9.019	17.701	0.223	91.699	5.831	0.074	90.541	23.532	0.297	182.241	53.934	0.681	191.259
2025	67.5	13.550	0.201	0.965	14.175	0.210	7.268	27.725	0.411	8.233	16.094	0.238	83.385	5.295	0.078	82.213	21.389	0.317	165.597	49.115	0.728	173.830
2026	59.0	13.550	0.230	0.965	14.175	0.240	7.268	27.725	0.470	8.233	16.094	0.273	83.385	5.295	0.090	82.213	21.389	0.363	165.597	49.115	0.832	173.830
2027	49.9	12.212	0.245	0.869	12.836	0.257	6.577	25.048	0.502	7.447	14.488	0.290	75.070	4.760	0.095	73.885	19.247	0.386	148.954	44.295	0.888	156.401
2028	42.2	10.204	0.242	0.726	10.828	0.257	5.541	21.031	0.498	6.268	12.078	0.286	62.597	3.957	0.094	61.393	16.034	0.380	123.990	37.066	0.878	130.258
2029	37.0	10.204	0.276	0.726	10.828	0.293	5.541	21.031	0.568	6.268	12.078	0.326	62.597	3.957	0.107	61.393	16.034	0.433	123.990	37.066	1.002	130.258
2030	32.4	8.865	0.274	0.631	9.489	0.293	4.851	18.354	0.566	5.482	10.471	0.323	54.282	3.421	0.106	53.065	13.892	0.429	107.347	32.246	0.995	112.828
2031	28.5	8.865	0.311	0.572	9.489	0.333	4.144	18.354	0.644	4.716	10.471	0.367	49.889	3.421	0.120	49.969	13.892	0.487	99.858	32.246	1.131	104.574
2032	25.0	8.865	0.355	0.631	9.489	0.380	4.851	18.354	0.734	5.482	10.471	0.419	54.282	3.421	0.137	53.065	13.892	0.556	107.347	32.246	1.290	112.828
2033	21.9	8.865	0.405	0.631	9.489	0.433	4.851	18.354	0.838	5.482	10.471	0.478	54.282	3.421	0.156	53.065	13.892	0.634	107.347	32.246	1.472	112.828
2034	17.0	7.526	0.443	0.536	8.150	0.479	4.160	15.676	0.922	4.696	8.865	0.521	45.967	2.886	0.170	44.736	11.75	0.69	90.70	27.427	1.613	95.399
2035	14.9	7.526	0.505	0.536	8.150	0.547	4.160	15.676	1.052	4.696	8.865	0.595	45.967	2.886	0.194	44.736	11.75	0.79	90.70	27.427	1.841	95.399
2036	8.3	5.102	0.615	0.363	5.414	0.652	2.771	10.516	1.267	3.134	6.039	0.728	31.299	1.978	0.238	30.696	8.02	0.97	61.99	18.533	2.233	65.129
2037	7.3	5.102	0.699	0.363	5.414	0.742	2.771	10.516	1.440	3.134	6.039	0.827	31.299	1.978	0.271	30.696	8.02	1.10	61.99	18.533	2.539	65.129
2038	6.5	5.102	0.785	0.363	5.414	0.833	2.771	10.516	1.618	3.134	6.039	0.929	31.299	1.978	0.304	30.696	8.02	1.23	61.99	18.533	2.851	65.129
Total LOF	1375.6	262.561		19	274.731		140	537.292		159	311.827		1611	102.590		1590	414.417		3201	951.709		3360
Average LOF		7.502	0.191	1	7.849	0.200	4	15.351	0.391	5	8.909	0.227	46	2.931	0.075	45	11.840	0.301	91	27.192	0.692	96

Table 4.5.3
Spill Occurrence - Sale All non Arctic - Platforms

Year	Water Depth	N Platforms	N P Wells	Small and Medium Spills 50-999 bbl			Large and Huge Spills =>1000 bbl		
				Expected Spill [bbl] =		452	Expected Spill [bbl] =		5631
		Cum.	Cum.	Frequency spills per 10^4well-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4well-year	Frequency spills per 10^3years	Spill Index bbl
2004	Shallow			2.157			0.360		
	Medium			2.157			0.360		
	Deep			2.157			0.360		
	Total								
2005	Shallow			2.157			0.360		
	Medium			2.157			0.360		
	Deep			2.157			0.360		
	Total								
2006	Shallow			2.157			0.360		
	Medium			2.157			0.360		
	Deep			2.157			0.360		
	Total								
2007	Shallow			2.157			0.360		
	Medium			2.157			0.360		
	Deep			2.157			0.360		
	Total								
2008	Shallow			2.157			0.360		
	Medium			2.157			0.360		
	Deep			2.157			0.360		
	Total								
2009	Shallow	1	3	2.157	0.647	0.29	0.360	0.108	0.61
	Medium			2.157			0.360		
	Deep			2.157			0.360		
	Total	**1**	**3**		**0.647**	**0.29**		**0.108**	**0.61**
2010	Shallow	1	13	2.157	2.804	1.27	0.360	0.467	2.63
	Medium			2.157			0.360		
	Deep			2.157			0.360		
	Total	**1**	**13**		**2.804**	**1.27**		**0.467**	**2.63**
2011	Shallow	2	26	2.157	5.609	2.53	0.360	0.935	5.26
	Medium			2.157			0.360		
	Deep			2.157			0.360		
	Total	**2**	**26**		**5.609**	**2.53**		**0.935**	**5.26**
2012	Shallow	3	39	2.157	8.413	3.80	0.360	1.402	7.90
	Medium			2.157			0.360		
	Deep			2.157			0.360		
	Total	**3**	**39**		**8.413**	**3.80**		**1.402**	**7.90**
2013	Shallow	3	59	2.157	12.727	5.75	0.360	2.121	11.94
	Medium			2.157			0.360		
	Deep			2.157			0.360		
	Total	**3**	**59**		**12.727**	**5.75**		**2.121**	**11.94**
2014	Shallow	3	69	2.157	14.884	6.73	0.360	2.481	13.97
	Medium	1	3	2.157	0.647	0.29	0.360	0.108	0.61
	Deep			2.157			0.360		
	Total	**4**	**72**		**15.531**	**7.02**		**2.589**	**14.58**
2015	Shallow	3	69	2.157	14.884	6.73	0.360	2.481	13.97
	Medium	1	13	2.157	2.804	1.27	0.360	0.467	2.63
	Deep			2.157			0.360		
	Total	**4**	**82**		**17.688**	**7.99**		**2.948**	**16.60**
2016	Shallow	3	69	2.157	14.884	6.73	0.360	2.481	13.97
	Medium	2	26	2.157	5.609	2.53	0.360	0.935	5.26
	Deep			2.157			0.360		
	Total	**5**	**95**		**20.493**	**9.26**		**3.415**	**19.23**
2017	Shallow	3	69	2.157	14.884	6.73	0.360	2.481	13.97
	Medium	3	39	2.157	8.413	3.80	0.360	1.402	7.90
	Deep			2.157			0.360		
	Total	**6**	**108**		**23.297**	**10.53**		**3.883**	**21.86**
2018	Shallow	3	69	2.157	14.884	6.73	0.360	2.481	13.97
	Medium	4	63	2.157	13.590	6.14	0.360	2.265	12.75
	Deep			2.157			0.360		
	Total	**7**	**132**		**28.474**	**12.87**		**4.746**	**26.72**
2019	Shallow	3	69	2.157	14.884	6.73	0.360	2.481	13.97
	Medium	5	87	2.157	18.767	8.48	0.360	3.128	17.61
	Deep			2.157			0.360		
	Total	**8**	**156**		**33.651**	**15.21**		**5.609**	**31.58**
2020	Shallow	3	69	2.157	14.884	6.73	0.360	2.481	13.97
	Medium	5	107	2.157	23.081	10.43	0.360	3.847	21.66
	Deep			2.157			0.360		
	Total	**8**	**176**		**37.965**	**17.16**		**6.328**	**35.63**
2021	Shallow	3	69	2.157	14.884	6.73	0.360	2.481	13.97
	Medium	5	127	2.157	27.396	12.38	0.360	4.566	25.71
	Deep			2.157			0.360		
	Total	**8**	**196**		**42.280**	**19.11**		**7.047**	**39.68**
2022	Shallow	3	69	2.157	14.884	6.73	0.360	2.481	13.97
	Medium	5	137	2.157	29.553	13.36	0.360	4.925	27.74
	Deep			2.157			0.360		
	Total	**8**	**206**		**44.437**	**20.08**		**7.406**	**41.70**
2023	Shallow	3	69	2.157	14.884	6.73	0.360	2.481	13.97
	Medium	5	137	2.157	29.553	13.36	0.360	4.925	27.74
	Deep			2.157			0.360		
	Total	**8**	**206**		**44.437**	**20.08**		**7.406**	**41.70**
2024	Shallow	3	69	2.157	14.884	6.73	0.360	2.481	13.97
	Medium	5	137	2.157	29.553	13.36	0.360	4.925	27.74

Table 4.5.3
Spill Occurrence - Sale All non Arctic - Platforms

Year	Water Depth	N Platforms	N P Wells	Small and Medium Spills 50-999 bbl			Large and Huge Spills =>1000 bbl		
				Expected Spill [bbl] =		452	Expected Spill [bbl] =		5631
		Cum.	Cum.	Frequency spills per 10^4well-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4well-year	Frequency spills per 10^3years	Spill Index bbl
2024	Deep			2.157			0.360		
	Total	**8**	**206**		**44.437**	**20.08**		**7.406**	**41.70**
2025	Shallow	2	46	2.157	9.923	4.48	0.360	1.654	9.31
	Medium	5	137	2.157	29.553	13.36	0.360	4.925	27.74
	Deep			2.157			0.360		
	Total	**7**	**183**		**39.475**	**17.84**		**6.579**	**37.05**
2026	Shallow	2	46	2.157	9.923	4.48	0.360	1.654	9.31
	Medium	5	137	2.157	29.553	13.36	0.360	4.925	27.74
	Deep			2.157			0.360		
	Total	**7**	**183**		**39.475**	**17.84**		**6.579**	**37.05**
2027	Shallow	1	23	2.157	4.961	2.24	0.360	0.827	4.66
	Medium	5	137	2.157	29.553	13.36	0.360	4.925	27.74
	Deep			2.157			0.360		
	Total	**6**	**160**		**34.514**	**15.60**		**5.752**	**32.39**
2028	Shallow			2.157			0.360		
	Medium	5	137	2.157	29.553	13.36	0.360	4.925	27.74
	Deep			2.157			0.360		
	Total	**5**	**137**		**29.553**	**13.36**		**4.925**	**27.74**
2029	Shallow			2.157			0.360		
	Medium	5	137	2.157	29.553	13.36	0.360	4.925	27.74
	Deep			2.157			0.360		
	Total	**5**	**137**		**29.553**	**13.36**		**4.925**	**27.74**
2030	Shallow			2.157			0.360		
	Medium	5	137	2.157	29.553	13.36	0.360	4.925	27.74
	Deep			2.157			0.360		
	Total	**5**	**137**		**29.553**	**13.36**		**4.925**	**27.74**
2031	Shallow			2.157			0.360		
	Medium	5	137	2.157	29.553	13.36	0.360	4.925	27.74
	Deep			2.157			0.360		
	Total	**5**	**137**		**29.553**	**13.36**		**4.925**	**27.74**
2032	Shallow			2.157			0.360		
	Medium	5	137	2.157	29.553	13.36	0.360	4.925	27.74
	Deep			2.157			0.360		
	Total	**5**	**137**		**29.553**	**13.36**		**4.925**	**27.74**
2033	Shallow			2.157			0.360		
	Medium	5	137	2.157	29.553	13.36	0.360	4.925	27.74
	Deep			2.157			0.360		
	Total	**5**	**137**		**29.553**	**13.36**		**4.925**	**27.74**
2034	Shallow			2.157			0.360		
	Medium	4	114	2.157	24.591	11.11	0.360	4.099	23.08
	Deep			2.157			0.360		
	Total	**4**	**114**		**24.591**	**11.11**		**4.099**	**23.08**
2035	Shallow			2.157			0.360		
	Medium	4	114	2.157	24.591	11.11	0.360	4.099	23.08
	Deep			2.157			0.360		
	Total	**4**	**114**		**24.591**	**11.11**		**4.099**	**23.08**
2036	Shallow			2.157			0.360		
	Medium	2	68	2.157	14.668	6.63	0.360	2.445	13.77
	Deep			2.157			0.360		
	Total	**2**	**68**		**14.668**	**6.63**		**2.445**	**13.77**
2037	Shallow			2.157			0.360		
	Medium	2	68	2.157	14.668	6.63	0.360	2.445	13.77
	Deep			2.157			0.360		
	Total	**2**	**68**		**14.668**	**6.63**		**2.445**	**13.77**
2038	Shallow			2.157			0.360		
	Medium	2	68	2.157	14.668	6.63	0.360	2.445	13.77
	Deep			2.157			0.360		
	Total	**2**	**68**		**14.668**	**6.63**		**2.445**	**13.77**

Table 4.5.4
Spill Occurrence - Sale All non Arctic - Platforms - Summary

Year	Production [MMbbl]	Small and Medium Spills 50-999 bbl			Large and Huge Spills =>1000 bbl			Significant Spills =>1000 bbl			All Spills		
		Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 103years	Frequency Spills per 109 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]
2004													
2005													
2006													
2007													
2008													
2009		0.647		0.292	0.108		0.607	0.108		0.607	0.755		0.900
2010	**7.9**	2.804	0.355	1.267	0.467	0.059	2.632	0.467	0.059	2.632	3.272	0.414	3.899
2011	**15.7**	5.609	0.357	2.535	0.935	0.060	5.264	0.935	0.060	5.264	6.543	0.417	7.798
2012	**23.6**	8.413	0.356	3.802	1.402	0.059	7.895	1.402	0.059	7.895	9.815	0.416	11.697
2013	**39.4**	12.727	0.323	5.752	2.121	0.054	11.944	2.121	0.054	11.944	14.848	0.377	17.696
2014	**44.4**	15.531	0.350	7.019	2.589	0.058	14.576	2.589	0.058	14.576	18.120	0.408	21.595
2015	**55.3**	17.688	0.320	7.994	2.948	0.053	16.601	2.948	0.053	16.601	20.637	0.373	24.594
2016	**59.5**	20.493	0.344	9.261	3.415	0.057	19.232	3.415	0.057	19.232	23.908	0.402	28.493
2017	**74.5**	23.297	0.313	10.528	3.883	0.052	21.864	3.883	0.052	21.864	27.180	0.365	32.393
2018	**76.1**	28.474	0.374	12.868	4.746	0.062	26.723	4.746	0.062	26.723	33.220	0.437	39.591
2019	**102.5**	33.651	0.328	15.208	5.609	0.055	31.581	5.609	0.055	31.581	39.260	0.383	46.789
2020	**103.5**	37.965	0.367	17.157	6.328	0.061	35.630	6.328	0.061	35.630	44.293	0.428	52.788
2021	**97.9**	42.280	0.432	19.107	7.047	0.072	39.679	7.047	0.072	39.679	49.326	0.504	58.786
2022	**93.1**	44.437	0.477	20.082	7.406	0.080	41.704	7.406	0.080	41.704	51.843	0.557	61.786
2023	**85.6**	44.437	0.519	20.082	7.406	0.087	41.704	7.406	0.087	41.704	51.843	0.606	61.786
2024	**79.2**	44.437	0.561	20.082	7.406	0.094	41.704	7.406	0.094	41.704	51.843	0.655	61.786
2025	**67.5**	39.475	0.585	17.840	6.579	0.097	37.048	6.579	0.097	37.048	46.055	0.682	54.887
2026	**59.0**	39.475	0.669	17.840	6.579	0.112	37.048	6.579	0.112	37.048	46.055	0.781	54.887
2027	**49.9**	34.514	0.692	15.598	5.752	0.115	32.391	5.752	0.115	32.391	40.266	0.807	47.989
2028	**42.2**	29.553	0.700	13.355	4.925	0.117	27.735	4.925	0.117	27.735	34.478	0.817	41.090
2029	**37.0**	29.553	0.799	13.355	4.925	0.133	27.735	4.925	0.133	27.735	34.478	0.932	41.090
2030	**32.4**	29.553	0.912	13.355	4.925	0.152	27.735	4.925	0.152	27.735	34.478	1.064	41.090
2031	**28.5**	29.553	1.037	13.355	4.925	0.173	27.735	4.925	0.173	27.735	34.478	1.210	41.090
2032	**25.0**	29.553	1.182	13.355	4.925	0.197	27.735	4.925	0.197	27.735	34.478	1.379	41.090
2033	**21.9**	29.553	1.349	13.355	4.925	0.225	27.735	4.925	0.225	27.735	34.478	1.574	41.090
2034	**17.0**	24.591	1.447	11.113	4.099	0.241	23.079	28.69	1.69	34.19	28.690	1.688	34.192
2035	**14.9**	24.591	1.650	11.113	4.099	0.275	23.079	28.69	1.93	34.19	28.690	1.925	34.192
2036	**8.3**	14.668	1.767	6.629	2.445	0.295	13.766	17.11	2.06	20.40	17.113	2.062	20.395
2037	**7.3**	14.668	2.009	6.629	2.445	0.335	13.766	17.11	2.34	20.40	17.113	2.344	20.395
2038	**6.5**	14.668	2.257	6.629	2.445	0.376	13.766	17.11	2.63	20.40	17.113	2.633	20.395
Total LOF	**1375.6**	**766.860**		**347**	**127.810**		**720**	**220.998**		**762**	**894.670**		**1066**
Average LOF		**21.910**	**0.557**	**10**	**3.652**	**0.093**	**21**	**6.314**	**0.161**	**22**	**25.562**	**0.650**	**30**

Table 4.5.5
Spill Occurrence - Sale All non Arctic - Production Wells

Year	Water Depth	Production Wells Blowout												
		N Wells	Small and Medium Spills 50-999 bbl			Large Spills 1000-9999 bbl			Spills 10000-149999 bbl			Spills =>150000 bbl		
			Expected Spill [bbl] =		519	Expected Spill [bbl] =		5292	Expected Spill [bbl] =		68349	Expected Spill [bbl] =		200000
		Cum.	Frequency spills per 10^4well-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4well-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4well-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4well-year	Frequency spills per 10^3years	Spill Index bbl
2004	Shallow		0.147			1.026			0.440			0.293		
	Medium		0.147			1.026			0.440			0.293		
	Deep		0.147			1.026			0.440			0.293		
	Total													
2005	Shallow		0.147			1.026			0.440			0.293		
	Medium		0.147			1.026			0.440			0.293		
	Deep		0.147			1.026			0.440			0.293		
	Total													
2006	Shallow		0.147			1.026			0.440			0.293		
	Medium		0.147			1.026			0.440			0.293		
	Deep		0.147			1.026			0.440			0.293		
	Total													
2007	Shallow		0.147			1.026			0.440			0.293		
	Medium		0.147			1.026			0.440			0.293		
	Deep		0.147			1.026			0.440			0.293		
	Total													
2008	Shallow		0.147			1.026			0.440			0.293		
	Medium		0.147			1.026			0.440			0.293		
	Deep		0.147			1.026			0.440			0.293		
	Total													
2009	Shallow	3	0.147	0.044	0.02	1.026	0.308	1.63	0.440	0.132	9.02	0.293	0.088	17.59
	Medium		0.147			1.026			0.440			0.293		
	Deep		0.147			1.026			0.440			0.293		
	Total	**3**		0.044	**0.02**		0.308	**1.63**		0.132	**9.02**		0.088	**17.59**
2010	Shallow	13	0.147	0.191	0.10	1.026	1.334	7.06	0.440	0.572	39.08	0.293	0.381	76.23
	Medium		0.147			1.026			0.440			0.293		
	Deep		0.147			1.026			0.440			0.293		
	Total	**13**		0.191	**0.10**		1.334	**7.06**		0.572	**39.08**		0.381	**76.23**
2011	Shallow	26	0.147	0.381	0.20	1.026	2.668	14.12	0.440	1.143	78.15	0.293	0.762	152.45
	Medium		0.147			1.026			0.440			0.293		
	Deep		0.147			1.026			0.440			0.293		
	Total	**26**		0.381	**0.20**		2.668	**14.12**		1.143	**78.15**		0.762	**152.45**
2012	Shallow	39	0.147	0.572	0.30	1.026	4.002	21.18	0.440	1.715	117.23	0.293	1.143	228.68
	Medium		0.147			1.026			0.440			0.293		
	Deep		0.147			1.026			0.440			0.293		
	Total	**39**		0.572	**0.30**		4.002	**21.18**		1.715	**117.23**		1.143	**228.68**
2013	Shallow	59	0.147	0.865	0.45	1.026	6.054	32.04	0.440	2.595	177.34	0.293	1.730	345.95
	Medium		0.147			1.026			0.440			0.293		
	Deep		0.147			1.026			0.440			0.293		
	Total	**59**		0.865	**0.45**		6.054	**32.04**		2.595	**177.34**		1.730	**345.95**
2014	Shallow	69	0.147	1.011	0.53	1.026	7.080	37.47	0.440	3.034	207.40	0.293	2.023	404.59
	Medium	3	0.147	0.044	0.02	1.026	0.308	1.63	0.440	0.132	9.02	0.293	0.088	17.59
	Deep		0.147			1.026			0.440			0.293		
	Total	**72**		1.055	**0.55**		7.388	**39.10**		3.166	**216.42**		2.111	**422.18**
2015	Shallow	69	0.147	1.011	0.53	1.026	7.080	37.47	0.440	3.034	207.40	0.293	2.023	404.59
	Medium	13	0.147	0.191	0.10	1.026	1.334	7.06	0.440	0.572	39.08	0.293	0.381	76.23
	Deep		0.147			1.026			0.440			0.293		
	Total	**82**		1.202	**0.62**		8.414	**44.53**		3.606	**246.47**		2.404	**480.82**
2016	Shallow	69	0.147	1.011	0.53	1.026	7.080	37.47	0.440	3.034	207.40	0.293	2.023	404.59
	Medium	26	0.147	0.381	0.20	1.026	2.668	14.12	0.440	1.143	78.15	0.293	0.762	152.45
	Deep		0.147			1.026			0.440			0.293		
	Total	**95**		1.393	**0.72**		9.748	**51.59**		4.178	**285.55**		2.785	**557.04**
2017	Shallow	69	0.147	1.011	0.53	1.026	7.080	37.47	0.440	3.034	207.40	0.293	2.023	404.59
	Medium	39	0.147	0.572	0.30	1.026	4.002	21.18	0.440	1.715	117.23	0.293	1.143	228.68
	Deep		0.147			1.026			0.440			0.293		
	Total	**108**		1.583	**0.82**		11.082	**58.65**		4.750	**324.62**		3.166	**633.27**
2018	Shallow	69	0.147	1.011	0.53	1.026	7.080	37.47	0.440	3.034	207.40	0.293	2.023	404.59
	Medium	63	0.147	0.924	0.48	1.026	6.465	34.21	0.440	2.771	189.36	0.293	1.847	369.41
	Deep		0.147			1.026			0.440			0.293		
	Total	**132**		1.935	**1.01**		13.545	**71.68**		5.805	**396.76**		3.870	**774.00**
2019	Shallow	69	0.147	1.011	0.53	1.026	7.080	37.47	0.440	3.034	207.40	0.293	2.023	404.59
	Medium	87	0.147	1.275	0.66	1.026	8.927	47.24	0.440	3.826	261.50	0.293	2.551	510.14
	Deep		0.147			1.026			0.440			0.293		
	Total	**156**		2.287	**1.19**		16.008	**84.71**		6.860	**468.90**		4.574	**914.73**
2020	Shallow	69	0.147	1.011	0.53	1.026	7.080	37.47	0.440	3.034	207.40	0.293	2.023	404.59
	Medium	107	0.147	1.569	0.81	1.026	10.980	58.11	0.440	4.706	321.62	0.293	3.137	627.41
	Deep		0.147			1.026			0.440			0.293		
	Total	**176**		2.580	**1.34**		18.060	**95.58**		7.740	**529.02**		5.160	**1032.00**
2021	Shallow	69	0.147	1.011	0.53	1.026	7.080	37.47	0.440	3.034	207.40	0.293	2.023	404.59
	Medium	127	0.147	1.862	0.97	1.026	13.032	68.97	0.440	5.585	381.73	0.293	3.723	744.68
	Deep		0.147			1.026			0.440			0.293		
	Total	**196**		2.873	**1.49**		20.112	**106.44**		8.620	**589.13**		5.746	**1149.27**

Table 4.5.5
Spill Occurrence - Sale All non Arctic - Production Wells

Year	Water Depth	Production Wells Blowout												
		N Wells	Small and Medium Spills 50-999 bbl			Large Spills 1000-9999 bbl			Spills 10000-149999 bbl			Spills =>150000 bbl		
			Expected Spill [bbl] =		519	Expected Spill [bbl] =		5292	Expected Spill [bbl] =		68349	Expected Spill [bbl] =		200000
		Cum.	Frequency spills per 10^4well-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4well-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4well-year	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4well-year	Frequency spills per 10^3years	Spill Index bbl
2022	Shallow	69	0.147	1.011	0.53	1.026	7.080	37.47	0.440	3.034	207.40	0.293	2.023	404.59
	Medium	137	0.147	2.008	1.04	1.026	14.058	74.40	0.440	6.025	411.79	0.293	4.017	803.32
	Deep		0.147			1.026			0.440			0.293		
	Total	**206**		3.020	**1.57**		21.138	**111.87**		9.059	**619.19**		6.040	**1207.91**
2023	Shallow	69	0.147	1.011	0.53	1.026	7.080	37.47	0.440	3.034	207.40	0.293	2.023	404.59
	Medium	137	0.147	2.008	1.04	1.026	14.058	74.40	0.440	6.025	411.79	0.293	4.017	803.32
	Deep		0.147			1.026			0.440			0.293		
	Total	**206**		3.020	**1.57**		21.138	**111.87**		9.059	**619.19**		6.040	**1207.91**
2024	Shallow	69	0.147	1.011	0.53	1.026	7.080	37.47	0.440	3.034	207.40	0.293	2.023	404.59
	Medium	137	0.147	2.008	1.04	1.026	14.058	74.40	0.440	6.025	411.79	0.293	4.017	803.32
	Deep		0.147			1.026			0.440			0.293		
	Total	**206**		3.020	**1.57**		21.138	**111.87**		9.059	**619.19**		6.040	**1207.91**
2025	Shallow	46	0.147	0.674	0.35	1.026	4.720	24.98	0.440	2.023	138.27	0.293	1.349	269.73
	Medium	137	0.147	2.008	1.04	1.026	14.058	74.40	0.440	6.025	411.79	0.293	4.017	803.32
	Deep		0.147			1.026			0.440			0.293		
	Total	**183**		2.683	**1.39**		18.778	**99.38**		8.048	**550.06**		5.365	**1073.04**
2026	Shallow	46	0.147	0.674	0.35	1.026	4.720	24.98	0.440	2.023	138.27	0.293	1.349	269.73
	Medium	137	0.147	2.008	1.04	1.026	14.058	74.40	0.440	6.025	411.79	0.293	4.017	803.32
	Deep		0.147			1.026			0.440			0.293		
	Total	**183**		2.683	**1.39**		18.778	**99.38**		8.048	**550.06**		5.365	**1073.04**
2027	Shallow	23	0.147	0.337	0.18	1.026	2.360	12.49	0.440	1.011	69.13	0.293	0.674	134.86
	Medium	137	0.147	2.008	1.04	1.026	14.058	74.40	0.440	6.025	411.79	0.293	4.017	803.32
	Deep		0.147			1.026			0.440			0.293		
	Total	**160**		2.345	**1.22**		16.418	**86.89**		7.036	**480.92**		4.691	**938.18**
2028	Shallow		0.147			1.026			0.440			0.293		
	Medium	137	0.147	2.008	1.04	1.026	14.058	74.40	0.440	6.025	411.79	0.293	4.017	803.32
	Deep		0.147			1.026			0.440			0.293		
	Total	**137**		2.008	**1.04**		14.058	**74.40**		6.025	**411.79**		4.017	**803.32**
2029	Shallow		0.147			1.026			0.440			0.293		
	Medium	137	0.147	2.008	1.04	1.026	14.058	74.40	0.440	6.025	411.79	0.293	4.017	803.32
	Deep		0.147			1.026			0.440			0.293		
	Total	**137**		2.008	**1.04**		14.058	**74.40**		6.025	**411.79**		4.017	**803.32**
2030	Shallow		0.147			1.026			0.440			0.293		
	Medium	137	0.147	2.008	1.04	1.026	14.058	74.40	0.440	6.025	411.79	0.293	4.017	803.32
	Deep		0.147			1.026			0.440			0.293		
	Total	**137**		2.008	**1.04**		14.058	**74.40**		6.025	**411.79**		4.017	**803.32**
2031	Shallow		0.147			1.026			0.440			0.293		
	Medium	137	0.147	2.008	1.04	1.026	14.058	74.40	0.440	6.025	411.79	0.293	4.017	803.32
	Deep		0.147			1.026			0.440			0.293		
	Total	**137**		2.008	**1.04**		14.058	**74.40**		6.025	**411.79**		4.017	**803.32**
2032	Shallow		0.147			1.026			0.440			0.293		
	Medium	137	0.147	2.008	1.04	1.026	14.058	74.40	0.440	6.025	411.79	0.293	4.017	803.32
	Deep		0.147			1.026			0.440			0.293		
	Total	**137**		2.008	**1.04**		14.058	**74.40**		6.025	**411.79**		4.017	**803.32**
2033	Shallow		0.147			1.026			0.440			0.293		
	Medium	137	0.147	2.008	1.04	1.026	14.058	74.40	0.440	6.025	411.79	0.293	4.017	803.32
	Deep		0.147			1.026			0.440			0.293		
	Total	**137**		2.008	**1.04**		14.058	**74.40**		6.025	**411.79**		4.017	**803.32**
2034	Shallow		0.147			1.026			0.440			0.293		
	Medium	114	0.147	1.671	0.87	1.026	11.698	61.91	0.440	5.013	342.66	0.293	3.342	668.45
	Deep		0.147			1.026			0.440			0.293		
	Total	**114**		1.671	**0.87**		11.698	**61.91**		5.013	**342.66**		3.342	**668.45**
2035	Shallow		0.147			1.026			0.440			0.293		
	Medium	114	0.147	1.671	0.87	1.026	11.698	61.91	0.440	5.013	342.66	0.293	3.342	668.45
	Deep		0.147			1.026			0.440			0.293		
	Total	**114**		1.671	**0.87**		11.698	**61.91**		5.013	**342.66**		3.342	**668.45**
2036	Shallow		0.147			1.026			0.440			0.293		
	Medium	68	0.147	0.997	0.52	1.026	6.978	36.93	0.440	2.990	204.39	0.293	1.994	398.73
	Deep		0.147			1.026			0.440			0.293		
	Total	**68**		0.997	**0.52**		6.978	**36.93**		2.990	**204.39**		1.994	**398.73**
2037	Shallow		0.147			1.026			0.440			0.293		
	Medium	68	0.147	0.997	0.52	1.026	6.978	36.93	0.440	2.990	204.39	0.293	1.994	398.73
	Deep		0.147			1.026			0.440			0.293		
	Total	**68**		0.997	**0.52**		6.978	**36.93**		2.990	**204.39**		1.994	**398.73**
2038	Shallow		0.147			1.026			0.440			0.293		
	Medium	68	0.147	0.997	0.52	1.026	6.978	36.93	0.440	2.990	204.39	0.293	1.994	398.73
	Deep		0.147			1.026			0.440			0.293		
	Total	**68**		0.997	**0.52**		6.978	**36.93**		2.990	**204.39**		1.994	**398.73**

Table 4.5.6
Spill Occurrence - Sale All non Arctic - Production Wells - Summary

Year	Production [MMbbl]	Small and Medium Spills 50-99 bbl			Large Spills 1000-9999 bbl			Huge Spills =>10000 bbl			All Spills		
		Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]
2004													
2005													
2006													
2007													
2008													
2009		0.044		0.023	0.132		1.629	0.220		26.608	0.396		28.260
2010	**7.9**	0.191	0.024	0.099	0.572	0.072	7.060	0.953	0.121	115.302	1.715	0.217	122.461
2011	**15.7**	0.381	0.024	0.198	1.143	0.073	14.119	1.906	0.121	230.605	3.430	0.218	244.922
2012	**23.6**	0.572	0.024	0.297	1.715	0.073	21.179	2.859	0.121	345.907	5.145	0.218	367.382
2013	**39.4**	0.865	0.022	0.449	2.595	0.066	32.039	4.324	0.110	523.295	7.784	0.198	555.784
2014	**44.4**	1.055	0.024	0.548	3.166	0.071	39.099	5.277	0.119	638.597	9.499	0.214	678.245
2015	**55.3**	1.202	0.022	0.624	3.606	0.065	44.529	6.010	0.109	727.291	10.818	0.196	772.445
2016	**59.5**	1.393	0.023	0.723	4.178	0.070	51.589	6.963	0.117	842.594	12.534	0.211	894.906
2017	**74.5**	1.583	0.021	0.822	4.750	0.064	58.648	7.916	0.106	957.896	14.249	0.191	#######
2018	**76.1**	1.935	0.025	1.005	5.805	0.076	71.681	9.675	0.127	#######	17.415	0.229	#######
2019	**102.5**	2.287	0.022	1.188	6.860	0.067	84.714	11.434	0.112	#######	20.581	0.201	#######
2020	**103.5**	2.580	0.025	1.340	7.740	0.075	95.575	12.900	0.125	#######	23.220	0.224	#######
2021	**97.9**	2.873	0.029	1.492	8.620	0.088	######	14.366	0.147	#######	25.859	0.264	#######
2022	**93.1**	3.020	0.032	1.568	9.059	0.097	######	15.099	0.162	#######	27.178	0.292	#######
2023	**85.6**	3.020	0.035	1.568	9.059	0.106	######	15.099	0.176	#######	27.178	0.317	#######
2024	**79.2**	3.020	0.038	1.568	9.059	0.114	######	15.099	0.191	#######	27.178	0.343	#######
2025	**67.5**	2.683	0.040	1.393	8.048	0.119	99.376	13.413	0.199	#######	24.143	0.358	#######
2026	**59.0**	2.683	0.045	1.393	8.048	0.136	99.376	13.413	0.227	#######	24.143	0.409	#######
2027	**49.9**	2.345	0.047	1.218	7.036	0.141	86.886	11.727	0.235	#######	21.109	0.423	#######
2028	**42.2**	2.008	0.048	1.043	6.025	0.143	74.397	10.041	0.238	#######	18.075	0.428	#######
2029	**37.0**	2.008	0.054	1.043	6.025	0.163	74.397	10.041	0.271	#######	18.075	0.489	#######
2030	**32.4**	2.008	0.062	1.043	6.025	0.186	74.397	10.041	0.310	#######	18.075	0.558	#######
2031	**28.5**	2.008	0.070	1.043	6.025	0.211	74.397	10.041	0.352	#######	18.075	0.634	#######
2032	**25.0**	2.008	0.080	1.043	6.025	0.241	74.397	10.041	0.402	#######	18.075	0.723	#######
2033	**21.9**	2.008	0.092	1.043	6.025	0.275	74.397	10.041	0.459	#######	18.075	0.825	#######
2034	**17.0**	1.671	0.098	0.868	5.013	0.295	61.907	8.356	0.492	#######	15.040	0.885	#######
2035	**14.9**	1.671	0.112	0.868	5.013	0.336	61.907	8.356	0.561	#######	15.040	1.009	#######
2036	**8.3**	0.997	0.120	0.518	2.990	0.360	36.927	4.984	0.600	603.120	8.971	1.081	640.564
2037	**7.3**	0.997	0.137	0.518	2.990	0.410	36.927	4.984	0.683	603.120	8.971	1.229	640.564
2038	**6.5**	0.997	0.153	0.518	2.990	0.460	36.927	4.984	0.767	603.120	8.971	1.380	640.564

Table 4.5.7
Occurrence Spill Risks - Sale All non Arctic - Exploration Wells

Year	Water Depth	Exploration Wells Blowout												
		N Wells	Small and Medium Spills 50-999 bbl			Large Spills 1000-9999 bbl			Spills 10000-149999 bbl			Spills =>150000 bbl		
			Expected Spill [bbl] =		519	Expected Spill [bbl] =		5292	Expected Spill [bbl] =		68349	Expected Spill [bbl] =		200000
		Cum.	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl
2004	Shallow	1	2.262	0.226	0.12	15.824	1.582	8.37	6.799	0.680	46.47	3.936	0.394	78.73
	Medium		2.262			15.824			6.799			3.936		
	Deep		2.262			15.824			6.799			3.936		
	Total	**1**		0.226	**0.12**		1.582	**8.37**		0.680	**46.47**		0.394	**78.73**
2005	Shallow	1	2.262	0.226	0.12	15.824	1.582	8.37	6.799	0.680	46.47	3.936	0.394	78.73
	Medium		2.262			15.824			6.799			3.936		
	Deep		2.262			15.824			6.799			3.936		
	Total	**1**		0.226	**0.12**		1.582	**8.37**		0.680	**46.47**		0.394	**78.73**
2006	Shallow	1	2.262	0.226	0.12	15.824	1.582	8.37	6.799	0.680	46.47	3.936	0.394	78.73
	Medium		2.262			15.824			6.799			3.936		
	Deep		2.262			15.824			6.799			3.936		
	Total	**1**		0.226	**0.12**		1.582	**8.37**		0.680	**46.47**		0.394	**78.73**
2007	Shallow	2	2.262	0.452	0.23	15.824	3.165	16.75	6.799	1.360	92.94	3.936	0.787	157.45
	Medium		2.262			15.824			6.799			3.936		
	Deep		2.262			15.824			6.799			3.936		
	Total	**2**		0.452	**0.23**		3.165	**16.75**		1.360	**92.94**		0.787	**157.45**
2008	Shallow	1	2.262	0.226	0.12	15.824	1.582	8.37	6.799	0.680	46.47	3.936	0.394	78.73
	Medium	1	2.262	0.226	0.12	15.824	1.582	8.37	6.799	0.680	46.47	3.936	0.394	78.73
	Deep		2.262			15.824			6.799			3.936		
	Total	**2**		0.452	**0.23**		3.165	**16.75**		1.360	**92.94**		0.787	**157.45**
2009	Shallow		2.262			15.824			6.799			3.936		
	Medium	1	2.262	0.226	0.12	15.824	1.582	8.37	6.799	0.680	46.47	3.936	0.394	78.73
	Deep		2.262			15.824			6.799			3.936		
	Total	**1**		0.226	**0.12**		1.582	**8.37**		0.680	**46.47**		0.394	**78.73**
2010	Shallow	1	2.262	0.226	0.12	15.824	1.582	8.37	6.799	0.680	46.47	3.936	0.394	78.73
	Medium	1	2.262	0.226	0.12	15.824	1.582	8.37	6.799	0.680	46.47	3.936	0.394	78.73
	Deep		2.262			15.824			6.799			3.936		
	Total	**2**		0.452	**0.23**		3.165	**16.75**		1.360	**92.94**		0.787	**157.45**
2011	Shallow		2.262			15.824			6.799			3.936		
	Medium		2.262			15.824			6.799			3.936		
	Deep		2.262			15.824			6.799			3.936		
	Total													
2012	Shallow		2.262			15.824			6.799			3.936		
	Medium	2	2.262	0.452	0.23	15.824	3.165	16.75	6.799	1.360	92.94	3.936	0.787	157.45
	Deep	1	2.262	0.226	0.12	15.824	1.582	8.37	6.799	0.680	46.47	3.936	0.394	78.73
	Total	**3**		0.678	**0.35**		4.747	**25.12**		2.040	**139.41**		1.181	**236.18**
2013	Shallow		2.262			15.824			6.799			3.936		
	Medium	1	2.262	0.226	0.12	15.824	1.582	8.37	6.799	0.680	46.47	3.936	0.394	78.73
	Deep	1	2.262	0.226	0.12	15.824	1.582	8.37	6.799	0.680	46.47	3.936	0.394	78.73
	Total	**2**		0.452	**0.23**		3.165	**16.75**		1.360	**92.94**		0.787	**157.45**
2014	Shallow		2.262			15.824			6.799			3.936		
	Medium		2.262			15.824			6.799			3.936		
	Deep		2.262			15.824			6.799			3.936		
	Total													
2015	Shallow		2.262			15.824			6.799			3.936		
	Medium		2.262			15.824			6.799			3.936		
	Deep	1	2.262	0.226	0.12	15.824	1.582	8.37	6.799	0.680	46.47	3.936	0.394	78.73
	Total	**1**		0.226	**0.12**		1.582	**8.37**		0.680	**46.47**		0.394	**78.73**
2016	Shallow		2.262			15.824			6.799			3.936		
	Medium		2.262			15.824			6.799			3.936		
	Deep		2.262			15.824			6.799			3.936		
	Total													
2017	Shallow		2.262			15.824			6.799			3.936		
	Medium		2.262			15.824			6.799			3.936		
	Deep	1	2.262	0.226	0.12	15.824	1.582	8.37	6.799	0.680	46.47	3.936	0.394	78.73
	Total	**1**		0.226	**0.12**		1.582	**8.37**		0.680	**46.47**		0.394	**78.73**
2018	Shallow		2.262			15.824			6.799			3.936		
	Medium		2.262			15.824			6.799			3.936		
	Deep	1	2.262	0.226	0.12	15.824	1.582	8.37	6.799	0.680	46.47	3.936	0.394	78.73
	Total	**1**		0.226	**0.12**		1.582	**8.37**		0.680	**46.47**		0.394	**78.73**
2019	Shallow		2.262			15.824			6.799			3.936		
	Medium		2.262			15.824			6.799			3.936		
	Deep		2.262			15.824			6.799			3.936		
	Total													
2020	Shallow		2.262			15.824			6.799			3.936		
	Medium		2.262			15.824			6.799			3.936		
	Deep		2.262			15.824			6.799			3.936		
	Total													
2021	Shallow		2.262			15.824			6.799			3.936		
	Medium		2.262			15.824			6.799			3.936		
	Deep		2.262			15.824			6.799			3.936		
	Total													
2022	Shallow		2.262			15.824			6.799			3.936		
	Medium		2.262			15.824			6.799			3.936		
	Deep		2.262			15.824			6.799			3.936		
	Total													
2023	Shallow		2.262			15.824			6.799			3.936		
	Medium		2.262			15.824			6.799			3.936		
	Deep		2.262			15.824			6.799			3.936		
	Total													
2024	Shallow		2.262			15.824			6.799			3.936		
	Medium		2.262			15.824			6.799			3.936		
	Deep		2.262			15.824			6.799			3.936		
	Total													
2025	Shallow		2.262			15.824			6.799			3.936		
	Medium		2.262			15.824			6.799			3.936		
	Deep		2.262			15.824			6.799			3.936		
	Total													
2026	Shallow		2.262			15.824			6.799			3.936		
	Medium		2.262			15.824			6.799			3.936		
	Deep		2.262			15.824			6.799			3.936		
	Total													
2027	Shallow		2.262			15.824			6.799			3.936		
	Medium		2.262			15.824			6.799			3.936		
	Deep		2.262			15.824			6.799			3.936		
	Total													
2028	Shallow		2.262			15.824			6.799			3.936		
	Medium		2.262			15.824			6.799			3.936		
	Deep		2.262			15.824			6.799			3.936		
	Total													
2029	Shallow		2.262			15.824			6.799			3.936		
	Medium		2.262			15.824			6.799			3.936		
	Deep		2.262			15.824			6.799			3.936		
	Total													

Table 4.5.7
Occurrence Spill Risks - Sale All non Arctic - Exploration Wells

Year	Water Depth	Exploration Wells Blowout												
		N Wells	Small and Medium Spills 50-999 bbl			Large Spills 1000-9999 bbl			Spills 10000-149999 bbl			Spills =>150000 bbl		
			Expected Spill [bbl] =		519	Expected Spill [bbl] =		5292	Expected Spill [bbl] =		68349	Expected Spill [bbl] =		200000
		Cum.	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl
2030	Shallow		2.262			15.824			6.799			3.936		
	Medium		2.262			15.824			6.799			3.936		
	Deep		2.262			15.824			6.799			3.936		
	Total													
2031	Shallow		2.262			15.824			6.799			3.936		
	Medium		2.262			15.824			6.799			3.936		
	Deep		2.262			15.824			6.799			3.936		
	Total													
2032	Shallow		2.262			15.824			6.799			3.936		
	Medium		2.262			15.824			6.799			3.936		
	Deep		2.262			15.824			6.799			3.936		
	Total													
2033	Shallow		2.262			15.824			6.799			3.936		
	Medium		2.262			15.824			6.799			3.936		
	Deep		2.262			15.824			6.799			3.936		
	Total													
2034	Shallow		2.262			15.824			6.799			3.936		
	Medium		2.262			15.824			6.799			3.936		
	Deep		2.262			15.824			6.799			3.936		
	Total													
2035	Shallow		2.262			15.824			6.799			3.936		
	Medium		2.262			15.824			6.799			3.936		
	Deep		2.262			15.824			6.799			3.936		
	Total													
2036	Shallow		2.262			15.824			6.799			3.936		
	Medium		2.262			15.824			6.799			3.936		
	Deep		2.262			15.824			6.799			3.936		
	Total													
2037	Shallow		2.262			15.824			6.799			3.936		
	Medium		2.262			15.824			6.799			3.936		
	Deep		2.262			15.824			6.799			3.936		
	Total													
2038	Shallow		2.262			15.824			6.799			3.936		
	Medium		2.262			15.824			6.799			3.936		
	Deep		2.262			15.824			6.799			3.936		
	Total													

Table 4.5.8
Spill Occurrence - Sale All non Arctic - Exploration Wells - Summary

Year	Production [MMbbl]	Small and Medium Spills 50-99 bbl			Large Spills 1000-9999 bbl			Huge Spills =>10000 bbl			All Spills		
		Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]
2004		0.226		0.117	0.680		8.374	1.074		125.199	1.980		133.690
2005		0.226		0.117	0.680		8.374	1.074		125.199	1.980		133.690
2006		0.226		0.117	0.680		8.374	1.074		125.199	1.980		133.690
2007		0.452		0.235	1.360		16.749	2.147		250.397	3.959		267.381
2008		0.452		0.235	1.360		16.749	2.147		250.397	3.959		267.381
2009		0.226		0.117	0.680		8.374	1.074		125.199	1.980		133.690
2010	**7.9**	0.452	0.057	0.235	1.360	0.172	16.749	2.147	0.272	250.397	3.959	0.501	267.381
2011	**15.7**												
2012	**23.6**	0.678	0.029	0.352	2.040	0.086	25.123	3.221	0.136	375.596	5.939	0.252	401.071
2013	**39.4**	0.452	0.011	0.235	1.360	0.035	16.749	2.147	0.054	250.397	3.959	0.100	267.381
2014	**44.4**												
2015	**55.3**	0.226	0.004	0.117	0.680	0.012	8.374	1.074	0.019	125.199	1.980	0.036	133.690
2016	**59.5**												
2017	**74.5**	0.226	0.003	0.117	0.680	0.009	8.374	1.074	0.014	125.199	1.980	0.027	133.690
2018	**76.1**	0.226	0.003	0.117	0.680	0.009	8.374	1.074	0.014	125.199	1.980	0.026	133.690
2019	**102.5**												
2020	**103.5**												
2021	**97.9**												
2022	**93.1**												
2023	**85.6**												
2024	**79.2**												
2025	**67.5**												
2026	**59.0**												
2027	**49.9**												
2028	**42.2**												
2029	**37.0**												
2030	**32.4**												
2031	**28.5**												
2032	**25.0**												
2033	**21.9**												
2034	**17.0**												
2035	**14.9**												
2036	**8.3**												
2037	**7.3**												
2038	**6.5**												

Table 4.5.9
Spill Occurrence Beaufort Sea Sale All non Arctic - Development Wells

Year	Water Depth	Development Wells Blowout												
		N Wells	Small and Medium Spills 50-999 bbl			Large Spills 1000-9999 bbl			Spills 10000-149999 bbl			Spills =>150000 bbl		
			Expected Spill [bbl] =		519	Expected Spill [bbl] =		5292	Expected Spill [bbl] =		68349	Expected Spill [bbl] =		200000
		Cum.	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl
2004	Shallow		0.692			4.833			2.076			2.076		
	Medium		0.692			4.833			2.076			2.076		
	Deep		0.692			4.833			2.076			2.076		
	Total													
2005	Shallow		0.692			4.833			2.076			2.076		
	Medium		0.692			4.833			2.076			2.076		
	Deep		0.692			4.833			2.076			2.076		
	Total													
2006	Shallow	2	0.692	0.138	0.07	4.833	0.967	5.12	2.076	0.415	28.38	2.076	0.415	83.04
	Medium		0.692			4.833			2.076			2.076		
	Deep		0.692			4.833			2.076			2.076		
	Total	**2**		0.138	**0.07**		0.967	**5.12**		0.415	**28.38**		0.415	**83.04**
2007	Shallow		0.692			4.833			2.076			2.076		
	Medium		0.692			4.833			2.076			2.076		
	Deep		0.692			4.833			2.076			2.076		
	Total													
2008	Shallow	2	0.692	0.138	0.07	4.833	0.967	5.12	2.076	0.415	28.38	2.076	0.415	83.04
	Medium		0.692			4.833			2.076			2.076		
	Deep		0.692			4.833			2.076			2.076		
	Total	**2**		0.138	**0.07**		0.967	**5.12**		0.415	**28.38**		0.415	**83.04**
2009	Shallow	2	0.692	0.138	0.07	4.833	0.967	5.12	2.076	0.415	28.38	2.076	0.415	83.04
	Medium		0.692			4.833			2.076			2.076		
	Deep		0.692			4.833			2.076			2.076		
	Total	**2**		0.138	**0.07**		0.967	**5.12**		0.415	**28.38**		0.415	**83.04**
2010	Shallow		0.692			4.833			2.076			2.076		
	Medium	2	0.692	0.138	0.07	4.833	0.967	5.12	2.076	0.415	28.38	2.076	0.415	83.04
	Deep		0.692			4.833			2.076			2.076		
	Total	**2**		0.138	**0.07**		0.967	**5.12**		0.415	**28.38**		0.415	**83.04**
2011	Shallow		0.692			4.833			2.076			2.076		
	Medium		0.692			4.833			2.076			2.076		
	Deep		0.692			4.833			2.076			2.076		
	Total													
2012	Shallow		0.692			4.833			2.076			2.076		
	Medium		0.692			4.833			2.076			2.076		
	Deep		0.692			4.833			2.076			2.076		
	Total													
2013	Shallow		0.692			4.833			2.076			2.076		
	Medium	3	0.692	0.208	0.11	4.833	1.450	7.67	2.076	0.623	42.57	2.076	0.623	124.56
	Deep		0.692			4.833			2.076			2.076		
	Total	**3**		0.208	**0.11**		1.450	**7.67**		0.623	**42.57**		0.623	**124.56**
2014	Shallow		0.692			4.833			2.076			2.076		
	Medium	4	0.692	0.277	0.14	4.833	1.933	10.23	2.076	0.830	56.76	2.076	0.830	166.08
	Deep		0.692			4.833			2.076			2.076		
	Total	**4**		0.277	**0.14**		1.933	**10.23**		0.830	**56.76**		0.830	**166.08**
2015	Shallow		0.692			4.833			2.076			2.076		
	Medium	2	0.692	0.138	0.07	4.833	0.967	5.12	2.076	0.415	28.38	2.076	0.415	83.04
	Deep		0.692			4.833			2.076			2.076		
	Total	**2**		0.138	**0.07**		0.967	**5.12**		0.415	**28.38**		0.415	**83.04**
2016	Shallow		0.692			4.833			2.076			2.076		
	Medium		0.692			4.833			2.076			2.076		
	Deep		0.692			4.833			2.076			2.076		
	Total													
2017	Shallow		0.692			4.833			2.076			2.076		
	Medium		0.692			4.833			2.076			2.076		
	Deep		0.692			4.833			2.076			2.076		
	Total													
2018	Shallow		0.692			4.833			2.076			2.076		
	Medium		0.692			4.833			2.076			2.076		
	Deep		0.692			4.833			2.076			2.076		
	Total													
2019	Shallow		0.692			4.833			2.076			2.076		
	Medium		0.692			4.833			2.076			2.076		
	Deep		0.692			4.833			2.076			2.076		
	Total													
2020	Shallow		0.692			4.833			2.076			2.076		
	Medium		0.692			4.833			2.076			2.076		
	Deep		0.692			4.833			2.076			2.076		
	Total													
2021	Shallow		0.692			4.833			2.076			2.076		
	Medium		0.692			4.833			2.076			2.076		
	Deep		0.692			4.833			2.076			2.076		
	Total													
2022	Shallow		0.692			4.833			2.076			2.076		
	Medium		0.692			4.833			2.076			2.076		
	Deep		0.692			4.833			2.076			2.076		
	Total													
2023	Shallow		0.692			4.833			2.076			2.076		
	Medium		0.692			4.833			2.076			2.076		
	Deep		0.692			4.833			2.076			2.076		
	Total													
2024	Shallow		0.692			4.833			2.076			2.076		
	Medium		0.692			4.833			2.076			2.076		
	Deep		0.692			4.833			2.076			2.076		
	Total													
2025	Shallow		0.692			4.833			2.076			2.076		
	Medium		0.692			4.833			2.076			2.076		
	Deep		0.692			4.833			2.076			2.076		
	Total													
2026	Shallow		0.692			4.833			2.076			2.076		
	Medium		0.692			4.833			2.076			2.076		
	Deep		0.692			4.833			2.076			2.076		
	Total													
2027	Shallow		0.692			4.833			2.076			2.076		
	Medium		0.692			4.833			2.076			2.076		
	Deep		0.692			4.833			2.076			2.076		
	Total													
2028	Shallow		0.692			4.833			2.076			2.076		
	Medium		0.692			4.833			2.076			2.076		
	Deep		0.692			4.833			2.076			2.076		
	Total													
2029	Shallow		0.692			4.833			2.076			2.076		
	Medium		0.692			4.833			2.076			2.076		
	Deep		0.692			4.833			2.076			2.076		
	Total													

Table 4.5.9
Spill Occurrence Beaufort Sea Sale All non Arctic - Development Wells

Year	Water Depth	Development Wells Blowout												
		N Wells	Small and Medium Spills 50-999 bbl			Large Spills 1000-9999 bbl			Spills 10000-149999 bbl			Spills =>150000 bbl		
			Expected Spill [bbl] =		519	Expected Spill [bbl] =		5292	Expected Spill [bbl] =		68349	Expected Spill [bbl] =		200000
		Cum.	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl	Frequency spills per 10^4wells	Frequency spills per 10^3years	Spill Index bbl
2030	Shallow		0.692			4.833			2.076			2.076		
	Medium		0.692			4.833			2.076			2.076		
	Deep		0.692			4.833			2.076			2.076		
	Total													
2031	Shallow		0.692			4.833			2.076			2.076		
	Medium		0.692			4.833			2.076			2.076		
	Deep		0.692			4.833			2.076			2.076		
	Total													
2032	Shallow		0.692			4.833			2.076			2.076		
	Medium		0.692			4.833			2.076			2.076		
	Deep		0.692			4.833			2.076			2.076		
	Total													
2033	Shallow		0.692			4.833			2.076			2.076		
	Medium		0.692			4.833			2.076			2.076		
	Deep		0.692			4.833			2.076			2.076		
	Total													
2034	Shallow		0.692			4.833			2.076			2.076		
	Medium		0.692			4.833			2.076			2.076		
	Deep		0.692			4.833			2.076			2.076		
	Total													
2035	Shallow		0.692			4.833			2.076			2.076		
	Medium		0.692			4.833			2.076			2.076		
	Deep		0.692			4.833			2.076			2.076		
	Total													
2036	Shallow		0.692			4.833			2.076			2.076		
	Medium		0.692			4.833			2.076			2.076		
	Deep		0.692			4.833			2.076			2.076		
	Total													
2037	Shallow		0.692			4.833			2.076			2.076		
	Medium		0.692			4.833			2.076			2.076		
	Deep		0.692			4.833			2.076			2.076		
	Total													
2038	Shallow		0.692			4.833			2.076			2.076		
	Medium		0.692			4.833			2.076			2.076		
	Deep		0.692			4.833			2.076			2.076		
	Total													

Table 4.5.10
Spill Occurrence - Sale All non Arctic - Development Wells - Summary

Year	Production [MMbbl]	Small and Medium Spills 50-99 bbl			Large Spills 1000-9999 bbl			Huge Spills =>10000 bbl			All Spills		
		Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]
2004													
2005													
2006		0.138		0.072	0.415		5.116	0.830		111.421	1.384		116.608
2007													
2008		0.138		0.072	0.415		5.116	0.830		111.421	1.384		116.608
2009		0.138		0.072	0.415		5.116	0.830		111.421	1.384		116.608
2010	**7.9**	0.138	0.018	0.072	0.415	0.053	5.116	0.830	0.105	111.421	1.384	0.175	116.608
2011	**15.7**												
2012	**23.6**												
2013	**39.4**	0.208	0.005	0.108	0.623	0.016	7.674	1.246	0.032	167.131	2.076	0.053	174.912
2014	**44.4**	0.277	0.006	0.144	0.830	0.019	10.232	1.661	0.037	222.841	2.768	0.062	233.217
2015	**55.3**	0.138	0.003	0.072	0.415	0.008	5.116	0.830	0.015	111.421	1.384	0.025	116.608
2016	**59.5**												
2017	**74.5**												
2018	**76.1**												
2019	**102.5**												
2020	**103.5**												
2021	**97.9**												
2022	**93.1**												
2023	**85.6**												
2024	**79.2**												
2025	**67.5**												
2026	**59.0**												
2027	**49.9**												
2028	**42.2**												
2029	**37.0**												
2030	**32.4**												
2031	**28.5**												
2032	**25.0**												
2033	**21.9**												
2034	**17.0**												
2035	**14.9**												
2036	**8.3**												
2037	**7.3**												
2038	**6.5**												

Table 4.5.11
Spill Occurrence - Sale All non Arctic - Wells - Summary

Year	Production [MMbbl]	Small and Medium Spills 50-999 bbl			Large Spills 1000-9999 bbl			Huge Spills =>10000 bbl			Significant Spills =>1000 bbl			All Spills		
		Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 103years	Frequency Spills per 109 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]
2004		0.226		0.117	0.680		8.374	1.074		125.199	1.753		133.573	1.980		133.690
2005		0.226		0.117	0.680		8.374	1.074		125.199	1.753		133.573	1.980		133.690
2006		0.365		0.189	1.095		13.490	1.904		236.619	2.999		250.109	3.364		250.299
2007		0.452		0.235	1.360		16.749	2.147		250.397	3.507		267.146	3.959		267.381
2008		0.591		0.307	1.775		21.864	2.978		361.818	4.753		383.682	5.343		383.989
2009		0.409		0.212	1.227		15.119	2.124		263.227	3.351		278.347	3.759		278.559
2010	**7.9**	0.781	0.099	0.406	2.347	0.297	28.924	3.930	0.498	477.120	6.277	0.795	506.044	7.058	0.893	506.450
2011	**15.7**	0.381	0.024	0.198	1.143	0.073	14.119	1.906	0.121	230.605	3.049	0.194	244.724	3.430	0.218	244.922
2012	**23.6**	1.250	0.053	0.649	3.755	0.159	46.302	6.079	0.258	721.503	9.834	0.417	767.805	11.084	0.470	768.454
2013	**39.4**	1.525	0.039	0.792	4.577	0.116	56.462	7.717	0.196	940.823	12.294	0.312	997.285	13.819	0.351	998.077
2014	**44.4**	1.332	0.030	0.692	3.997	0.090	49.331	6.938	0.156	861.439	10.935	0.246	910.769	12.267	0.276	911.461
2015	**55.3**	1.567	0.028	0.814	4.701	0.085	58.019	7.914	0.143	963.911	12.615	0.228	#######	14.182	0.256	#######
2016	**59.5**	1.393	0.023	0.723	4.178	0.070	51.589	6.963	0.117	842.594	11.141	0.187	894.183	12.534	0.211	894.906
2017	**74.5**	1.809	0.024	0.940	5.429	0.073	67.023	8.989	0.121	#######	14.419	0.194	#######	16.228	0.218	#######
2018	**76.1**	2.161	0.028	1.123	6.485	0.085	80.056	10.749	0.141	#######	17.233	0.226	#######	19.395	0.255	#######
2019	**102.5**	2.287	0.022	1.188	6.860	0.067	84.714	11.434	0.112	#######	18.295	0.178	#######	20.581	0.201	#######
2020	**103.5**	2.580	0.025	1.340	7.740	0.075	95.575	12.900	0.125	#######	20.640	0.199	#######	23.220	0.224	#######
2021	**97.9**	2.873	0.029	1.492	8.620	0.088	######	14.366	0.147	#######	22.985	0.235	#######	25.859	0.264	#######
2022	**93.1**	3.020	0.032	1.568	9.059	0.097	######	15.099	0.162	#######	24.158	0.259	#######	27.178	0.292	#######
2023	**85.6**	3.020	0.035	1.568	9.059	0.106	######	15.099	0.176	#######	24.158	0.282	#######	27.178	0.317	#######
2024	**79.2**	3.020	0.038	1.568	9.059	0.114	######	15.099	0.191	#######	24.158	0.305	#######	27.178	0.343	#######
2025	**67.5**	2.683	0.040	1.393	8.048	0.119	99.376	13.413	0.199	#######	21.461	0.318	#######	24.143	0.358	#######
2026	**59.0**	2.683	0.045	1.393	8.048	0.136	99.376	13.413	0.227	#######	21.461	0.364	#######	24.143	0.409	#######
2027	**49.9**	2.345	0.047	1.218	7.036	0.141	86.886	11.727	0.235	#######	18.764	0.376	#######	21.109	0.423	#######
2028	**42.2**	2.008	0.048	1.043	6.025	0.143	74.397	10.041	0.238	#######	16.066	0.381	#######	18.075	0.428	#######
2029	**37.0**	2.008	0.054	1.043	6.025	0.163	74.397	10.041	0.271	#######	16.066	0.434	#######	18.075	0.489	#######
2030	**32.4**	2.008	0.062	1.043	6.025	0.186	74.397	10.041	0.310	#######	16.066	0.496	#######	18.075	0.558	#######
2031	**28.5**	2.008	0.070	1.043	6.025	0.211	74.397	10.041	0.352	#######	16.066	0.564	#######	18.075	0.634	#######
2032	**25.0**	2.008	0.080	1.043	6.025	0.241	74.397	10.041	0.402	#######	16.066	0.643	#######	18.075	0.723	#######
2033	**21.9**	2.008	0.092	1.043	6.025	0.275	74.397	10.041	0.459	#######	16.066	0.734	#######	18.075	0.825	#######
2034	**17.0**	1.671	0.098	0.868	5.013	0.295	61.907	8.356	0.492	#######	13.37	0.79	1073.02	15.040	0.885	#######
2035	**14.9**	1.671	0.112	0.868	5.013	0.336	61.907	8.356	0.561	#######	13.37	0.90	1073.02	15.040	1.009	#######
2036	**8.3**	0.997	0.120	0.518	2.990	0.360	36.927	4.984	0.600	603.120	7.97	0.96	640.05	8.971	1.081	640.564
2037	**7.3**	0.997	0.137	0.518	2.990	0.410	36.927	4.984	0.683	603.120	7.97	1.09	640.05	8.971	1.229	640.564
2038	**6.5**	0.997	0.153	0.518	2.990	0.460	36.927	4.984	0.767	603.120	7.97	1.23	640.05	8.971	1.380	640.564
Total LOF	**1375.6**	**57.360**		**30**	**172.107**		**2125**	**286.948**		**34731**	**459.054**		**36856**	**516.415**		**36886**
Average LOF		**1.639**	**0.042**	**1**	**4.917**	**0.125**	**61**	**8.199**	**0.209**	**992**	**13.116**	**0.334**	**1053**	**14.755**	**0.375**	**1054**

Table 4.5.12
Spill Occurrence - Sale All non Arctic - Summary

Year	Facility	Production [MMbbl]	Small and Medium Spills 50-999 bbl			Large Spills 1000-9999 bbl			Huge Spills =>10000 bbl			All Spills		
			Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]
2004	Pipeline													
	Platforms													
	Production Wells													
	Exploration Wells		0.226		0.117	0.680		8.374	1.074		125.199	1.980		133.690
	Development Wells													
	Total		0.226		0.117	0.680		8.374	1.074		125.199	1.980		133.690
2005	Pipeline													
	Platforms													
	Production Wells													
	Exploration Wells		0.226		0.117	0.680		8.374	1.074		125.199	1.980		133.690
	Development Wells													
	Total		0.226		0.117	0.680		8.374	1.074		125.199	1.980		133.690
2006	Pipeline													
	Platforms													
	Production Wells													
	Exploration Wells		0.226		0.117	0.680		8.374	1.074		125.199	1.980		133.690
	Development Wells		0.138		0.072	0.415		5.116	0.830		111.421	1.384		116.608
	Total		0.365		0.189	1.095		13.490	1.904		236.619	3.364		250.299
2007	Pipeline													
	Platforms													
	Production Wells													
	Exploration Wells		0.452		0.235	1.360		16.749	2.147		250.397	3.959		267.381
	Development Wells													
	Total		0.452		0.235	1.360		16.749	2.147		250.397	3.959		267.381
2008	Pipeline													
	Platforms													
	Production Wells													
	Exploration Wells		0.452		0.235	1.360		16.749	2.147		250.397	3.959		267.381
	Development Wells		0.138		0.072	0.415		5.116	0.830		111.421	1.384		116.608
	Total		0.591		0.307	1.775		21.864	2.978		361.818	5.343		383.989
2009	Pipeline													
	Platforms		0.647		0.292	0.054		0.304	0.054		0.304	0.755		0.900
	Production Wells		0.044		0.023	0.132		1.629	0.220		26.608	0.396		28.260
	Exploration Wells		0.226		0.117	0.680		8.374	1.074		125.199	1.980		133.690
	Development Wells		0.138		0.072	0.415		5.116	0.830		111.421	1.384		116.608
	Total		1.056		0.505	1.281		15.423	2.178		263.531	4.514		279.459
2010	Pipeline	7.9	2.678	0.339	0.786	1.607	0.203	8.315	0.536	0.068	8.328	4.820	0.610	17.429
	Platforms		2.804	0.355	1.267	0.234	0.030	1.316	0.234	0.030	1.316	3.272	0.414	3.899
	Production Wells		0.191	0.024	0.099	0.572	0.072	7.060	0.953	0.121	115.302	1.715	0.217	122.461
	Exploration Wells		0.452	0.057	0.235	1.360	0.172	16.749	2.147	0.272	250.397	3.959	0.501	267.381
	Development Wells		0.138	0.018	0.072	0.415	0.053	5.116	0.830	0.105	111.421	1.384	0.175	116.608
	Total		6.263	0.793	2.459	4.187	0.530	38.555	4.700	0.595	486.764	15.150	1.918	527.778
2011	Pipeline	15.7	2.678	0.171	0.786	1.607	0.102	8.315	0.536	0.034	8.328	4.820	0.307	17.429
	Platforms		5.609	0.357	2.535	0.467	0.030	2.632	0.467	0.030	2.632	6.543	0.417	7.798
	Production Wells		0.381	0.024	0.198	1.143	0.073	14.119	1.906	0.121	230.605	3.430	0.218	244.922
	Exploration Wells													
	Development Wells													
	Total		8.667	0.552	3.519	3.217	0.205	25.066	2.909	0.185	241.565	14.793	0.942	270.149
2012	Pipeline	23.6	5.355	0.227	1.572	3.213	0.136	16.630	1.071	0.045	16.656	9.639	0.408	34.858
	Platforms		8.413	0.356	3.802	0.701	0.030	3.948	0.701	0.030	3.948	9.815	0.416	11.697
	Production Wells		0.572	0.024	0.297	1.715	0.073	21.179	2.859	0.121	345.907	5.145	0.218	367.382
	Exploration Wells		0.678	0.029	0.352	2.040	0.086	25.123	3.221	0.136	375.596	5.939	0.252	401.071
	Development Wells													
	Total		15.018	0.636	6.023	7.669	0.325	66.879	7.851	0.333	742.107	30.538	1.294	815.009
2013	Pipeline	39.4	8.033	0.204	2.358	4.820	0.122	24.945	1.607	0.041	24.984	14.459	0.367	52.287
	Platforms		12.727	0.323	5.752	1.061	0.027	5.972	1.061	0.027	5.972	14.848	0.377	17.696
	Production Wells		0.865	0.022	0.449	2.595	0.066	32.039	4.324	0.110	523.295	7.784	0.198	555.784
	Exploration Wells		0.452	0.011	0.235	1.360	0.035	16.749	2.147	0.054	250.397	3.959	0.100	267.381
	Development Wells		0.208	0.005	0.108	0.623	0.016	7.674	1.246	0.032	167.131	2.076	0.053	174.912
	Total		22.284	0.566	8.902	10.457	0.265	87.379	10.384	0.264	971.780	43.126	1.095	1068.060
2014	Pipeline	44.4	8.033	0.181	2.358	4.820	0.109	24.945	1.607	0.036	24.984	14.459	0.326	52.287
	Platforms		15.531	0.350	7.019	1.294	0.029	7.288	1.294	0.029	7.288	18.120	0.408	21.595
	Production Wells		1.055	0.024	0.548	3.166	0.071	39.099	5.277	0.119	638.597	9.499	0.214	678.245
	Exploration Wells													
	Development Wells		0.277	0.006	0.144	0.830	0.019	10.232	1.661	0.037	222.841	2.768	0.062	233.217
	Total		24.896	0.561	10.069	10.111	0.228	81.563	9.839	0.222	893.711	44.846	1.010	985.343
2015	Pipeline	55.3	13.388	0.242	3.930	8.033	0.145	41.574	2.678	0.048	41.641	24.098	0.436	87.145
	Platforms		17.688	0.320	7.994	1.474	0.027	8.300	1.474	0.027	8.300	20.637	0.373	24.594
	Production Wells		1.202	0.022	0.624	3.606	0.065	44.529	6.010	0.109	727.291	10.818	0.196	772.445
	Exploration Wells		0.226	0.004	0.117	0.680	0.012	8.374	1.074	0.019	125.199	1.980	0.036	133.690
	Development Wells		0.138	0.003	0.072	0.415	0.008	5.116	0.830	0.015	111.421	1.384	0.025	116.608
	Total		32.643	0.590	12.738	14.208	0.257	107.894	12.066	0.218	1013.852	58.916	1.065	1134.484
2016	Pipeline	59.5	13.388	0.225	3.930	8.033	0.135	41.574	2.678	0.045	41.641	24.098	0.405	87.145
	Platforms		20.493	0.344	9.261	1.708	0.029	9.616	1.708	0.029	9.616	23.908	0.402	28.493
	Production Wells		1.393	0.023	0.723	4.178	0.070	51.589	6.963	0.117	842.594	12.534	0.211	894.906
	Exploration Wells													
	Development Wells													
	Total		35.273	0.593	13.915	13.918	0.234	102.779	11.348	0.191	893.851	60.540	1.017	1010.545
2017	Pipeline	74.5	21.226	0.285	6.278	12.465	0.167	64.558	4.120	0.055	64.009	37.811	0.508	134.845
	Platforms		23.297	0.313	10.528	1.941	0.026	10.932	1.941	0.026	10.932	27.180	0.365	32.393
	Production Wells		1.583	0.021	0.822	4.750	0.064	58.648	7.916	0.106	957.896	14.249	0.191	1017.367
	Exploration Wells		0.226	0.003	0.117	0.680	0.009	8.374	1.074	0.014	125.199	1.980	0.027	133.690
	Development Wells													
	Total		46.332	0.622	17.746	19.836	0.266	142.513	15.051	0.202	1158.036	81.219	1.090	1318.295
2018	Pipeline	76.1	21.226	0.279	6.278	12.465	0.164	64.558	4.120	0.054	64.009	37.811	0.497	134.845
	Platforms		28.474	0.374	12.868	2.373	0.031	13.361	2.373	0.031	13.361	33.220	0.437	39.591
	Production Wells		1.935	0.025	1.005	5.805	0.076	71.681	9.675	0.127	1170.762	17.415	0.229	1243.448
	Exploration Wells		0.226	0.003	0.117	0.680	0.009	8.374	1.074	0.014	125.199	1.980	0.026	133.690
	Development Wells													
	Total		51.861	0.681	20.268	21.323	0.280	157.975	17.242	0.227	1373.331	90.425	1.188	1551.575
2019	Pipeline	102.5	30.403	0.297	9.019	17.701	0.173	91.699	5.831	0.057	90.541	53.934	0.526	191.259
	Platforms		33.651	0.328	15.208	2.804	0.027	15.791	2.804	0.027	15.791	39.260	0.383	46.789
	Production Wells		2.287	0.022	1.188	6.860	0.067	84.714	11.434	0.112	1383.628	20.581	0.201	1469.530
	Exploration Wells													
	Development Wells													
	Total		66.341	0.647	25.414	27.365	0.267	192.204	20.069	0.196	1489.960	113.775	1.110	1707.578
2020	Pipeline	103.5	30.403	0.294	9.019	17.701	0.171	91.699	5.831	0.056	90.541	53.934	0.521	191.259
	Platforms		37.965	0.367	17.157	3.164	0.031	17.815	3.164	0.031	17.815	44.293	0.428	52.788
	Production Wells		2.580	0.025	1.340	7.740	0.075	95.575	12.900	0.125	1561.016	23.220	0.224	1657.931
	Exploration Wells													
	Development Wells													
	Total		70.948	0.685	27.516	28.604	0.276	205.090	21.895	0.212	1669.372	121.447	1.173	1901.978

Table 4.5.12
Spill Occurrence - Sale All non Arctic - Summary

Year	Facility	Production [MMbbl]	Small and Medium Spills 50-999 bbl			Large Spills 1000-9999 bbl			Huge Spills =>10000 bbl			All Spills		
			Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]
2021	Pipeline	97.9	30.403	0.311	9.019	17.701	0.181	91.699	5.831	0.060	90.541	53.934	0.551	191.259
	Platforms		42.280	0.432	19.107	3.523	0.036	19.840	3.523	0.036	19.840	49.326	0.504	58.786
	Production Wells		2.873	0.029	1.492	8.620	0.088	106.436	14.366	0.147	1738.404	25.859	0.264	1846.332
	Exploration Wells													
	Development Wells													
	Total		75.556	0.772	29.618	29.843	0.305	217.975	23.720	0.242	1848.785	129.119	1.319	2096.378
2022	Pipeline	93.1	30.403	0.327	9.019	17.701	0.190	91.699	5.831	0.063	90.541	53.934	0.579	191.259
	Platforms		44.437	0.477	20.082	3.703	0.040	20.852	3.703	0.040	20.852	51.843	0.557	61.786
	Production Wells		3.020	0.032	1.568	9.059	0.097	111.866	15.099	0.162	1827.098	27.178	0.292	1940.533
	Exploration Wells													
	Development Wells													
	Total		77.859	0.836	30.669	30.463	0.327	224.418	24.633	0.265	1938.491	132.955	1.428	2193.578
2023	Pipeline	85.6	30.403	0.355	9.019	17.701	0.207	91.699	5.831	0.068	90.541	53.934	0.630	191.259
	Platforms		44.437	0.519	20.082	3.703	0.043	20.852	3.703	0.043	20.852	51.843	0.606	61.786
	Production Wells		3.020	0.035	1.568	9.059	0.106	111.866	15.099	0.176	1827.098	27.178	0.317	1940.533
	Exploration Wells													
	Development Wells													
	Total		77.859	0.910	30.669	30.463	0.356	224.418	24.633	0.288	1938.491	132.955	1.553	2193.578
2024	Pipeline	79.2	30.403	0.384	9.019	17.701	0.223	91.699	5.831	0.074	90.541	53.934	0.681	191.259
	Platforms		44.437	0.561	20.082	3.703	0.047	20.852	3.703	0.047	20.852	51.843	0.655	61.786
	Production Wells		3.020	0.038	1.568	9.059	0.114	111.866	15.099	0.191	1827.098	27.178	0.343	1940.533
	Exploration Wells													
	Development Wells													
	Total		77.859	0.983	30.669	30.463	0.385	224.418	24.633	0.311	1938.491	132.955	1.679	2193.578
2025	Pipeline	67.5	27.725	0.411	8.233	16.094	0.238	83.385	5.295	0.078	82.213	49.115	0.728	173.830
	Platforms		39.475	0.585	17.840	3.290	0.049	18.524	3.290	0.049	18.524	46.055	0.682	54.887
	Production Wells		2.683	0.040	1.393	8.048	0.119	99.376	13.413	0.199	1623.102	24.143	0.358	1723.871
	Exploration Wells													
	Development Wells													
	Total		69.883	1.035	27.466	27.432	0.406	201.285	21.998	0.326	1723.838	119.313	1.768	1952.589
2026	Pipeline	59.0	27.725	0.470	8.233	16.094	0.273	83.385	5.295	0.090	82.213	49.115	0.832	173.830
	Platforms		39.475	0.669	17.840	3.290	0.056	18.524	3.290	0.056	18.524	46.055	0.781	54.887
	Production Wells		2.683	0.045	1.393	8.048	0.136	99.376	13.413	0.227	1623.102	24.143	0.409	1723.871
	Exploration Wells													
	Development Wells													
	Total		69.883	1.184	27.466	27.432	0.465	201.285	21.998	0.373	1723.838	119.313	2.022	1952.589
2027	Pipeline	49.9	25.048	0.502	7.447	14.488	0.290	75.070	4.760	0.095	73.885	44.295	0.888	156.401
	Platforms		34.514	0.692	15.598	2.876	0.058	16.196	2.876	0.058	16.196	40.266	0.807	47.989
	Production Wells		2.345	0.047	1.218	7.036	0.141	86.886	11.727	0.235	1419.105	21.109	0.423	1507.210
	Exploration Wells													
	Development Wells													
	Total		61.907	1.241	24.263	24.400	0.489	178.152	19.363	0.388	1509.186	105.670	2.118	1711.600
2028	Pipeline	42.2	21.031	0.498	6.268	12.078	0.286	62.597	3.957	0.094	61.393	37.066	0.878	130.258
	Platforms		29.553	0.700	13.355	2.463	0.058	13.868	2.463	0.058	13.868	34.478	0.817	41.090
	Production Wells		2.008	0.048	1.043	6.025	0.143	74.397	10.041	0.238	1215.109	18.075	0.428	1290.549
	Exploration Wells													
	Development Wells													
	Total		52.592	1.246	20.666	20.565	0.487	150.861	16.461	0.390	1290.369	89.618	2.124	1461.897
2029	Pipeline	37.0	21.031	0.568	6.268	12.078	0.326	62.597	3.957	0.107	61.393	37.066	1.002	130.258
	Platforms		29.553	0.799	13.355	2.463	0.067	13.868	2.463	0.067	13.868	34.478	0.932	41.090
	Production Wells		2.008	0.054	1.043	6.025	0.163	74.397	10.041	0.271	1215.109	18.075	0.489	1290.549
	Exploration Wells													
	Development Wells													
	Total		52.592	1.421	20.666	20.565	0.556	150.861	16.461	0.445	1290.369	89.618	2.422	1461.897
2030	Pipeline	32.4	18.354	0.566	5.482	10.471	0.323	54.282	3.421	0.106	53.065	32.246	0.995	112.828
	Platforms		29.553	0.912	13.355	2.463	0.076	13.868	2.463	0.076	13.868	34.478	1.064	41.090
	Production Wells		2.008	0.062	1.043	6.025	0.186	74.397	10.041	0.310	1215.109	18.075	0.558	1290.549
	Exploration Wells													
	Development Wells													
	Total		49.915	1.541	19.880	18.959	0.585	142.546	15.925	0.492	1282.041	84.799	2.617	1444.468
2031	Pipeline	25.0	18.354	0.644	4.716	10.471	0.367	49.889	3.421	0.120	49.969	32.246	1.131	104.574
	Platforms		29.553	1.037	13.355	2.463	0.086	13.868	2.463	0.086	13.868	34.478	1.210	41.090
	Production Wells		2.008	0.070	1.043	6.025	0.211	74.397	10.041	0.352	1215.109	18.075	0.634	1290.549
	Exploration Wells													
	Development Wells													
	Total		49.915	1.751	19.115	18.959	0.665	138.153	15.925	0.559	1278.945	84.799	2.975	1436.214
2032	Pipeline	21.9	18.354	0.734	5.482	10.471	0.419	54.282	3.421	0.137	53.065	32.246	1.290	112.828
	Platforms		29.553	1.182	13.355	2.463	0.099	13.868	2.463	0.099	13.868	34.478	1.379	41.090
	Production Wells		2.008	0.080	1.043	6.025	0.241	74.397	10.041	0.402	1215.109	18.075	0.723	1290.549
	Exploration Wells													
	Development Wells													
	Total		49.915	1.997	19.880	18.959	0.758	142.546	15.925	0.637	1282.041	84.799	3.392	1444.468
2033	Pipeline	14.9	18.354	0.838	5.482	10.471	0.478	54.282	3.421	0.156	53.065	32.246	1.472	112.828
	Platforms		29.553	1.349	13.355	2.463	0.112	13.868	2.463	0.112	13.868	34.478	1.574	41.090
	Production Wells		2.008	0.092	1.043	6.025	0.275	74.397	10.041	0.459	1215.109	18.075	0.825	1290.549
	Exploration Wells													
	Development Wells													
	Total		49.915	2.279	19.880	18.959	0.866	142.546	15.925	0.727	1282.041	84.799	3.872	1444.468
2034	Pipeline	8.3	15.676	0.922	4.696	8.865	0.521	45.967	2.886	0.170	44.736	27.427	1.613	95.399
	Platforms		24.591	1.447	11.113	2.049	0.121	11.539	2.049	0.121	11.539	28.690	1.688	34.192
	Production Wells		1.671	0.098	0.868	5.013	0.295	61.907	8.356	0.492	1011.113	15.040	0.885	1073.887
	Exploration Wells													
	Development Wells													
	Total		41.939	2.467	16.677	15.927	0.937	119.413	13.291	0.782	1067.388	71.157	4.186	1203.479
2035	Pipeline	6.5	15.676	1.052	4.696	8.865	0.595	45.967	2.886	0.194	44.736	27.427	1.841	95.399
	Platforms		24.591	1.650	11.113	2.049	0.138	11.539	2.049	0.138	11.539	28.690	1.925	34.192
	Production Wells		1.671	0.112	0.868	5.013	0.336	61.907	8.356	0.561	1011.113	15.040	1.009	1073.887
	Exploration Wells													
	Development Wells													
	Total		41.939	2.815	16.677	15.927	1.069	119.413	13.291	0.892	1067.388	71.157	4.776	1203.479
2036	Pipeline		10.516	1.267	3.134	6.039	0.728	31.299	1.978	0.238	30.696	18.533	2.233	65.129
	Platforms		14.668	1.767	6.629	1.222	0.147	6.883	1.222	0.147	6.883	17.113	2.062	20.395
	Production Wells		0.997	0.120	0.518	2.990	0.360	36.927	4.984	0.600	603.120	8.971	1.081	640.564
	Exploration Wells													
	Development Wells													
	Total		26.181	3.154	10.281	10.252	1.235	75.109	8.185	0.986	640.699	44.617	5.376	726.088
2037	Pipeline		10.516	1.440	3.134	6.039	0.827	31.299	1.978	0.271	30.696	18.533	2.539	65.129
	Platforms		14.668	2.009	6.629	1.222	0.167	6.883	1.222	0.167	6.883	17.113	2.344	20.395
	Production Wells		0.997	0.137	0.518	2.990	0.410	36.927	4.984	0.683	603.120	8.971	1.229	640.564
	Exploration Wells													
	Development Wells													
	Total		26.181	3.586	10.281	10.252	1.404	75.109	8.185	1.121	640.699	44.617	6.112	726.088
	Pipeline		10.516	1.618	3.134	6.039	0.929	31.299	1.978	0.304	30.696	18.533	2.851	65.129
	Platforms		14.668	2.257	6.629	1.222	0.188	6.883	1.222	0.188	6.883	17.113	2.633	20.395

Table 4.5.12
Spill Occurrence - Sale All non Arctic - Summary

Year	Facility	Production [MMbbl]	Small and Medium Spills 50-999 bbl			Large Spills 1000-9999 bbl			Huge Spills =>10000 bbl			All Spills		
			Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]
2038	Production Wells		0.997	0.153	0.518	2.990	0.460	36.927	4.984	0.767	603.120	8.971	1.380	640.564
	Exploration Wells													
	Development Wells													
	Total		26.181	4.028	10.281	10.252	1.577	75.109	8.185	1.259	640.699	44.617	6.864	726.088

Table 4.5.13
Spill Occurrence - Sale All non Arctic - Annual Summary

Year	Production [MMbbl]	Small and Medium Spills 50-999 bbl			Large Spills 1000-9999 bbl			Huge Spills =>10000 bbl			Significant Spills =>1000 bbl			All Spills		
		Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]	Frequency Spills per 103years	Frequency Spills per 109 bbl Produced	Spill Index [bbl]	Frequency Spills per 10^3years	Frequency Spills per 10^9 bbl Produced	Spill Index [bbl]
2004		0.226		0.117	0.680		8.374	1.074		125.199	1.753		133.573	1.980		133.690
2005		0.226		0.117	0.680		8.374	1.074		125.199	1.753		133.573	1.980		133.690
2006		0.365		0.189	1.095		13.490	1.904		236.619	2.999		250.109	3.364		250.299
2007		0.452		0.235	1.360		16.749	2.147		250.397	3.507		267.146	3.959		267.381
2008		0.591		0.307	1.775		21.864	2.978		361.818	4.753		383.682	5.343		383.989
2009		1.056		0.505	1.281		15.423	2.178		263.531	3.459		278.954	4.514		279.459
2010	**7.9**	6.263	0.022	2.459	4.187	0.066	38.555	4.700	0.110	486.764	8.887	0.176	525.319	15.150	0.285	527.778
2011	**15.7**	8.667	0.011	3.519	3.217	0.035	25.066	2.909	0.054	241.565	6.126	0.089	266.630	14.793	0.144	270.149
2012	**23.6**	15.018	0.005	6.023	7.669	0.016	66.879	7.851	0.032	742.107	15.520	0.047	808.986	30.538	0.079	815.009
2013	**39.4**	22.284	0.566	8.902	10.457	0.265	87.379	10.384	0.264	971.780	20.842	0.529	1059.158	43.126	1.095	#######
2014	**44.4**	24.896	0.561	10.069	10.111	0.228	81.563	9.839	0.222	893.711	19.950	0.449	975.274	44.846	1.010	985.343
2015	**55.3**	32.643	0.590	12.738	14.208	0.257	107.894	12.066	0.218	#######	26.274	0.475	1121.746	58.916	1.065	#######
2016	**59.5**	35.273	0.593	13.915	13.918	0.234	102.779	11.348	0.191	893.851	25.266	0.425	996.630	60.540	1.017	#######
2017	**74.5**	46.332	0.622	17.746	19.836	0.266	142.513	15.051	0.202	#######	34.887	0.468	1300.549	81.219	1.090	#######
2018	**76.1**	51.861	0.681	20.268	21.323	0.280	157.975	17.242	0.227	#######	38.564	0.507	1531.306	90.425	1.188	#######
2019	**102.5**	66.341	0.647	25.414	27.365	0.267	192.204	20.069	0.196	#######	47.435	0.463	1682.164	113.775	1.110	#######
2020	**103.5**	70.948	0.685	27.516	28.604	0.276	205.090	21.895	0.212	#######	50.499	0.488	1874.462	121.447	1.173	#######
2021	**97.9**	75.556	0.772	29.618	29.843	0.305	217.975	23.720	0.242	#######	53.564	0.547	2066.760	129.119	1.319	#######
2022	**93.1**	77.859	0.836	30.669	30.463	0.327	224.418	24.633	0.265	#######	55.096	0.592	2162.909	132.955	1.428	#######
2023	**85.6**	77.859	0.910	30.669	30.463	0.356	224.418	24.633	0.288	#######	55.096	0.644	2162.909	132.955	1.553	#######
2024	**79.2**	77.859	0.983	30.669	30.463	0.385	224.418	24.633	0.311	#######	55.096	0.696	2162.909	132.955	1.679	#######
2025	**67.5**	69.883	1.035	27.466	27.432	0.406	201.285	21.998	0.326	#######	49.430	0.732	1925.123	119.313	1.768	#######
2026	**59.0**	69.883	1.184	27.466	27.432	0.465	201.285	21.998	0.373	#######	49.430	0.838	1925.123	119.313	2.022	#######
2027	**49.9**	61.907	1.241	24.263	24.400	0.489	178.152	19.363	0.388	#######	43.763	0.877	1687.338	105.670	2.118	#######
2028	**42.2**	52.592	1.246	20.666	20.565	0.487	150.861	16.461	0.390	#######	37.026	0.877	1441.230	89.618	2.124	#######
2029	**37.0**	52.592	1.421	20.666	20.565	0.556	150.861	16.461	0.445	#######	37.026	1.001	1441.230	89.618	2.422	#######
2030	**32.4**	49.915	1.541	19.880	18.959	0.585	142.546	15.925	0.492	#######	34.884	1.077	1424.587	84.799	2.617	#######
2031	**28.5**	49.915	1.751	19.115	18.959	0.665	138.153	15.925	0.559	#######	34.884	1.224	1417.099	84.799	2.975	#######
2032	**25.0**	49.915	1.997	19.880	18.959	0.758	142.546	15.925	0.637	#######	34.884	1.395	1424.587	84.799	3.392	#######
2033	**21.9**	49.915	2.279	19.880	18.959	0.866	142.546	15.925	0.727	#######	34.884	1.593	1424.587	84.799	3.872	#######
2034	**17.0**	41.939	2.467	16.677	15.927	0.937	119.413	13.291	0.782	1067.39	29.22	1.72	1186.80	71.157	4.186	#######
2035	**14.9**	41.939	2.815	16.677	15.927	1.069	119.413	13.291	0.892	1067.39	29.22	1.96	1186.80	71.157	4.776	#######
2036	**8.3**	26.181	3.154	10.281	10.252	1.235	75.109	8.185	0.986	640.70	18.44	2.22	715.81	44.617	5.376	726.088
2037	**7.3**	26.181	3.586	10.281	10.252	1.404	75.109	8.185	1.121	640.70	18.44	2.53	715.81	44.617	6.112	726.088
2038	**6.5**	26.181	4.028	10.281	10.252	1.577	75.109	8.185	1.259	640.70	18.44	2.84	715.81	44.617	6.864	726.088
Total LOF	**1375.6**	**1361.512**		**535**	**547.839**		**4096**	**453.443**		**36681**	**1001.282**		**40777**	**2362.794**		**41312**
Average LOF		**38.900**	**0.990**	**15**	**15.653**	**0.398**	**117**	**12.956**	**0.330**	**1048**	**28.608**	**0.728**	**1165**	**67.508**	**1.718**	**1180**

Table 4.5.14
Sale All non Arctic - Year 2024 - Monte Carlo Results

Sale All non Arctic Year 2024	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills
	Frequency Spills per 10^3years					Frequency Spills per 10^9 bbl Produced					Spill Index [bbl]				
Mean =	77.86	30.46	24.63	55.10	132.96	0.98	0.38	0.31	0.70	1.68	30.56	224.84	1937.14	2161.97	2192.53
Std Deviation =	34.52	11.12	6.08	14.20	37.24	0.44	0.14	0.08	0.18	0.47	22.12	110.17	724.15	730.89	730.77
Variance =	1191.441	123.724	37.023	201.706	1386.990	0.190	0.020	0.006	0.032	0.221	489.312	12138.430	524394.600	534203.300	534030.200
Skewness =	0.41	0.42	0.12	0.22	0.31	0.41	0.42	0.12	0.22	0.31	1.55	0.77	0.46	0.44	0.45
Kurtosis =	2.55	2.56	2.88	2.74	2.63	2.55	2.56	2.88	2.74	2.63	5.93	3.51	3.11	3.10	3.10
Mode =	33.56	30.87	35.42	38.20	137.34	0.42	0.39	0.29	0.67	1.44	29.77	132.72	2079.76	1977.82	2010.21
Minimum =	8.817	5.112	5.891	17.724	41.710	0.111	0.065	0.074	0.224	0.527	-1.998	5.641	251.897	376.582	426.193
5% Perc =	27.504	14.346	14.877	32.840	76.646	0.347	0.181	0.188	0.415	0.968	6.931	74.735	851.352	1073.574	1102.062
10% Perc =	34.709	16.805	16.945	36.955	86.098	0.438	0.212	0.214	0.467	1.087	9.265	96.418	1047.872	1254.550	1290.020
15% Perc =	41.441	18.907	18.260	40.138	93.441	0.523	0.239	0.231	0.507	1.180	11.146	114.110	1177.367	1389.938	1425.981
20% Perc =	46.104	20.464	19.258	42.616	99.688	0.582	0.258	0.243	0.538	1.259	12.955	128.849	1296.875	1528.657	1563.413
25% Perc =	50.843	22.011	20.337	44.881	104.992	0.642	0.278	0.257	0.567	1.326	14.793	142.106	1420.558	1646.546	1672.868
30% Perc =	55.605	23.389	21.277	46.900	110.578	0.702	0.295	0.269	0.592	1.396	16.512	155.275	1520.373	1737.067	1770.278
35% Perc =	59.850	24.694	22.123	48.982	114.721	0.756	0.312	0.279	0.618	1.448	18.415	168.398	1610.040	1829.941	1856.235
40% Perc =	64.793	26.115	22.949	50.767	119.816	0.818	0.330	0.290	0.641	1.513	20.308	181.882	1692.924	1919.342	1947.100
45% Perc =	69.573	27.610	23.791	52.485	124.933	0.878	0.349	0.300	0.663	1.577	22.222	195.351	1780.954	2010.073	2039.333
50% Perc =	74.259	29.026	24.548	54.483	129.871	0.938	0.366	0.310	0.688	1.640	24.467	207.624	1879.098	2098.449	2128.648
55% Perc =	79.521	30.673	25.283	56.302	135.247	1.004	0.387	0.319	0.711	1.708	26.807	222.953	1970.531	2199.134	2229.001
60% Perc =	84.524	32.388	26.020	58.242	141.042	1.067	0.409	0.329	0.735	1.780	29.454	237.208	2063.482	2293.606	2326.409
65% Perc =	90.164	34.255	26.857	60.193	146.316	1.138	0.433	0.339	0.760	1.847	32.406	253.856	2171.583	2397.588	2426.913
70% Perc =	95.453	36.111	27.823	62.279	152.635	1.205	0.456	0.351	0.786	1.927	35.867	269.990	2276.770	2509.054	2542.947
75% Perc =	101.578	38.063	28.800	64.553	158.403	1.283	0.481	0.364	0.815	2.000	39.913	290.338	2403.704	2630.685	2655.646
80% Perc =	108.350	40.412	29.984	67.261	165.728	1.368	0.510	0.379	0.849	2.093	44.778	315.351	2534.795	2762.533	2793.170
85% Perc =	116.700	42.953	31.054	70.570	173.759	1.473	0.542	0.392	0.891	2.194	51.366	339.050	2697.835	2917.402	2952.054
90% Perc =	126.529	46.389	32.546	74.039	184.234	1.598	0.586	0.411	0.935	2.326	60.251	378.238	2898.324	3127.660	3164.976
95% Perc =	139.629	50.546	34.765	79.789	198.059	1.763	0.638	0.439	1.007	2.501	75.970	430.743	3219.934	3455.432	3479.107
Maximum =	182.846	65.927	49.972	106.795	263.397	2.309	0.832	0.631	1.348	3.326	175.717	710.388	4991.787	5325.566	5345.080

Table 4.5.15
Sale All non Arctic LOF Average - Pipeline - Monte Carlo Results

Sale All non Arctic Pipeline	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills
All years Average LOF	**Frequency Spills per 10^3years**					**Frequency Spills per 10^9 bbl Produced**					**Spill Index [bbl]**				
Mean =	15.35	8.91	2.93	11.84	27.19	0.39	0.23	0.07	0.30	0.69	4.54	46.30	45.33	91.63	96.17
Std Deviation =	8.46	5.07	1.69	5.34	9.96	0.22	0.13	0.04	0.14	0.25	3.36	37.87	27.93	46.84	46.93
Variance =	71.635	25.655	2.845	28.566	99.217	0.046	0.017	0.002	0.018	0.064	11.258	1433.946	780.262	2194.110	2202.401
Skewness =	0.53	0.53	0.54	0.48	0.40	0.53	0.53	0.54	0.48	0.40	1.34	1.41	0.77	0.90	0.90
Kurtosis =	2.40	2.41	2.40	2.53	2.67	2.40	2.41	2.40	2.53	2.67	4.83	5.15	2.97	3.83	3.82
Mode =	6.63	11.11	1.31	9.38	21.97	0.17	0.28	0.03	0.24	0.72	1.50	16.09	40.84	57.87	78.96
Minimum =	0.826	0.382	0.061	1.163	4.445	0.021	0.010	0.002	0.030	0.113	0.156	-6.100	1.058	6.365	12.906
5% Perc =	4.034	2.158	0.692	4.344	12.427	0.103	0.055	0.018	0.111	0.316	0.833	5.820	10.152	30.148	34.406
10% Perc =	5.299	2.862	0.938	5.394	14.745	0.135	0.073	0.024	0.137	0.375	1.192	9.183	13.944	38.404	42.181
15% Perc =	6.339	3.505	1.138	6.137	16.553	0.161	0.089	0.029	0.156	0.421	1.476	12.131	16.775	44.806	49.229
20% Perc =	7.221	4.142	1.327	6.914	18.221	0.184	0.105	0.034	0.176	0.464	1.766	15.186	19.841	50.858	55.441
25% Perc =	8.357	4.697	1.526	7.655	19.568	0.213	0.120	0.039	0.195	0.498	2.035	18.102	22.884	56.310	60.963
30% Perc =	9.342	5.333	1.740	8.254	21.084	0.238	0.136	0.044	0.210	0.537	2.341	21.256	26.056	61.173	66.055
35% Perc =	10.431	5.975	1.948	8.916	22.353	0.265	0.152	0.050	0.227	0.569	2.639	24.719	29.103	66.976	71.364
40% Perc =	11.562	6.636	2.175	9.634	23.660	0.294	0.169	0.055	0.245	0.602	2.951	27.764	32.580	72.624	77.215
45% Perc =	12.748	7.345	2.401	10.342	24.924	0.324	0.187	0.061	0.263	0.634	3.263	31.424	35.869	78.465	82.500
50% Perc =	13.988	8.069	2.656	11.204	26.221	0.356	0.205	0.068	0.285	0.667	3.602	35.488	39.575	83.463	88.422
55% Perc =	15.250	8.823	2.900	11.998	27.584	0.388	0.224	0.074	0.305	0.702	4.005	39.946	43.764	89.994	94.498
60% Perc =	16.649	9.667	3.185	12.753	29.018	0.424	0.246	0.081	0.324	0.738	4.444	44.841	47.880	96.483	101.173
65% Perc =	18.047	10.560	3.469	13.550	30.520	0.459	0.269	0.088	0.345	0.777	4.940	50.460	52.351	103.554	108.062
70% Perc =	19.594	11.456	3.782	14.482	32.040	0.499	0.291	0.096	0.368	0.815	5.520	56.662	57.670	110.624	115.285
75% Perc =	21.376	12.520	4.136	15.514	33.927	0.544	0.319	0.105	0.395	0.863	6.145	64.397	63.160	118.471	122.983
80% Perc =	23.184	13.653	4.510	16.662	35.958	0.590	0.347	0.115	0.424	0.915	6.941	73.228	69.610	128.525	132.777
85% Perc =	25.420	14.883	4.938	17.983	38.237	0.647	0.379	0.126	0.458	0.973	7.914	83.810	76.561	138.982	143.982
90% Perc =	27.769	16.391	5.428	19.475	41.178	0.707	0.417	0.138	0.496	1.048	9.252	99.999	86.279	155.048	159.550
95% Perc =	31.041	18.349	6.092	21.673	44.744	0.790	0.467	0.155	0.551	1.138	11.388	122.832	99.395	180.526	185.145
Maximum =	39.413	23.385	7.595	28.790	62.800	1.003	0.595	0.193	0.733	1.598	21.577	250.078	146.806	296.607	300.040

Table 4.5.16
Sale All non Arctic LOF Average - Platforms - Monte Carlo Results

Sale All non Arctic Platforms	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills
All years Average LOF	**Frequency Spills per 10^3years**					**Frequency Spills per 10^9 bbl Produced**					**Spill Index [bbl]**				
Mean =	21.91	1.83	1.83	3.65	25.56	0.56	0.05	0.05	0.09	0.65	9.85	10.21	10.21	20.43	30.28
Std Deviation =	14.85	1.24	1.24	2.48	15.03	0.38	0.03	0.03	0.06	0.38	10.27	9.09	9.09	18.17	20.83
Variance =	220.517	1.531	1.531	6.126	225.857	0.143	0.001	0.001	0.004	0.146	105.572	82.548	82.548	330.192	433.707
Skewness =	0.56	0.56	0.56	0.56	0.55	0.56	0.56	0.56	0.56	0.55	1.77	1.27	1.27	1.27	1.07
Kurtosis =	2.40	2.40	2.40	2.40	2.43	2.40	2.40	2.40	2.40	2.43	6.68	4.46	4.46	4.46	4.19
Mode =	2.03	0.22	0.22	0.45	9.81	0.05	0.01	0.01	0.01	0.25	0.84	1.44	1.44	2.88	27.30
Minimum =	0.146	0.013	0.013	0.025	0.924	0.004	0.000	0.000	0.001	0.024	-3.961	-4.817	-4.817	-9.634	-2.700
5% Perc =	2.516	0.210	0.210	0.420	5.412	0.064	0.005	0.005	0.011	0.138	0.366	0.600	0.600	1.200	4.851
10% Perc =	4.149	0.346	0.346	0.692	7.796	0.106	0.009	0.009	0.018	0.198	0.811	1.205	1.205	2.410	7.779
15% Perc =	5.837	0.486	0.486	0.973	9.683	0.149	0.012	0.012	0.025	0.247	1.310	1.783	1.783	3.565	10.127
20% Perc =	7.568	0.631	0.631	1.261	11.181	0.193	0.016	0.016	0.032	0.284	1.856	2.447	2.447	4.894	12.090
25% Perc =	9.353	0.780	0.780	1.560	12.895	0.238	0.020	0.020	0.040	0.328	2.479	3.184	3.184	6.369	14.150
30% Perc =	11.207	0.934	0.934	1.867	14.854	0.285	0.024	0.024	0.048	0.378	3.136	3.976	3.976	7.952	16.341
35% Perc =	13.125	1.093	1.093	2.187	16.846	0.334	0.028	0.028	0.056	0.429	3.873	4.710	4.710	9.420	18.451
40% Perc =	15.115	1.259	1.259	2.519	18.821	0.385	0.032	0.032	0.064	0.479	4.666	5.594	5.594	11.188	20.830
45% Perc =	17.190	1.432	1.432	2.865	20.944	0.437	0.036	0.036	0.073	0.533	5.478	6.560	6.560	13.120	23.184
50% Perc =	19.367	1.614	1.614	3.228	23.104	0.493	0.041	0.041	0.082	0.588	6.385	7.643	7.643	15.286	25.683
55% Perc =	21.645	1.804	1.804	3.608	25.538	0.551	0.046	0.046	0.092	0.650	7.455	8.761	8.761	17.522	28.630
60% Perc =	24.068	2.005	2.005	4.011	27.787	0.612	0.051	0.051	0.102	0.707	8.728	9.886	9.886	19.771	31.395
65% Perc =	26.632	2.219	2.219	4.439	30.255	0.678	0.056	0.056	0.113	0.770	10.047	11.363	11.363	22.726	34.748
70% Perc =	29.397	2.450	2.450	4.901	33.027	0.748	0.062	0.062	0.125	0.841	11.621	12.930	12.930	25.861	38.361
75% Perc =	32.407	2.701	2.701	5.401	36.196	0.825	0.069	0.069	0.137	0.921	13.847	14.953	14.953	29.906	42.121
80% Perc =	35.727	2.977	2.977	5.954	39.436	0.909	0.076	0.076	0.151	1.003	16.253	17.251	17.251	34.503	46.504
85% Perc =	39.504	3.292	3.292	6.583	43.365	1.005	0.084	0.084	0.167	1.103	19.518	19.794	19.794	39.588	51.420
90% Perc =	43.983	3.664	3.664	7.328	47.806	1.119	0.093	0.093	0.186	1.216	24.332	23.105	23.105	46.210	59.310
95% Perc =	49.804	4.151	4.151	8.302	53.344	1.267	0.106	0.106	0.211	1.357	30.997	28.481	28.481	56.963	70.900
Maximum =	63.630	5.316	5.316	10.633	70.457	1.619	0.135	0.135	0.271	1.793	65.892	55.491	55.491	110.982	135.405

Table 4.5.17
Sale All non Arctic LOF Average - Wells - Monte Carlo Results

Sale All non Arctic Wells	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills
All years Average LOF	**Frequency Spills per 10^3years**					**Frequency Spills per 10^9 bbl Produced**					**Spill Index [bbl]**				
Mean =	1.64	4.92	8.20	13.12	14.75	0.04	0.13	0.21	0.33	0.38	0.85	60.76	991.19	1051.96	1052.80
Std Deviation =	0.61	1.82	2.17	3.81	3.86	0.02	0.05	0.06	0.10	0.10	0.58	39.80	368.28	369.61	369.61
Variance =	0.371	3.317	4.694	14.542	14.912	0.000	0.002	0.003	0.009	0.010	0.335	1584.340	135628.200	136610.000	136614.000
Skewness =	-0.01	-0.01	-0.01	-0.01	0.01	-0.01	-0.01	-0.01	-0.01	0.01	0.77	0.85	0.49	0.49	0.49
Kurtosis =	2.41	2.41	2.72	2.54	2.55	2.41	2.41	2.72	2.54	2.55	3.44	3.57	3.18	3.18	3.18
Mode =	1.54	5.15	9.19	13.09	9.79	0.04	0.13	0.15	0.38	0.39	0.58	27.34	909.21	1022.44	1028.72
Minimum =	0.133	0.423	1.549	2.289	3.416	0.003	0.011	0.039	0.058	0.087	-0.313	-11.433	139.525	143.755	144.851
5% Perc =	0.609	1.853	4.627	6.740	8.353	0.015	0.047	0.118	0.171	0.213	0.070	8.465	440.171	497.274	498.356
10% Perc =	0.817	2.441	5.400	8.036	9.650	0.021	0.062	0.137	0.204	0.246	0.168	15.093	546.571	601.372	602.121
15% Perc =	0.968	2.912	5.920	9.019	10.599	0.025	0.074	0.151	0.230	0.270	0.264	20.900	615.368	669.445	669.644
20% Perc =	1.095	3.270	6.348	9.826	11.330	0.028	0.083	0.162	0.250	0.288	0.343	25.696	670.138	728.787	729.679
25% Perc =	1.199	3.608	6.693	10.427	11.996	0.031	0.092	0.170	0.265	0.305	0.416	30.552	724.214	784.437	784.908
30% Perc =	1.298	3.897	7.030	11.002	12.616	0.033	0.099	0.179	0.280	0.321	0.485	35.131	772.799	832.859	833.621
35% Perc =	1.400	4.197	7.317	11.523	13.135	0.036	0.107	0.186	0.293	0.334	0.551	40.012	818.899	882.557	883.347
40% Perc =	1.485	4.435	7.593	12.128	13.684	0.038	0.113	0.193	0.309	0.348	0.614	44.583	866.229	929.695	930.361
45% Perc =	1.563	4.687	7.908	12.626	14.237	0.040	0.119	0.201	0.321	0.362	0.678	49.578	912.837	975.811	976.327
50% Perc =	1.634	4.934	8.199	13.121	14.735	0.042	0.126	0.209	0.334	0.375	0.752	53.772	962.948	1021.763	1023.091
55% Perc =	1.715	5.165	8.475	13.616	15.279	0.044	0.131	0.216	0.346	0.389	0.828	59.103	1006.561	1068.410	1069.262
60% Perc =	1.798	5.402	8.766	14.087	15.788	0.046	0.137	0.223	0.358	0.402	0.903	64.483	1054.279	1114.517	1115.368
65% Perc =	1.885	5.653	9.057	14.637	16.278	0.048	0.144	0.230	0.372	0.414	0.991	70.091	1107.404	1166.183	1166.823
70% Perc =	1.984	5.914	9.391	15.297	16.909	0.050	0.150	0.239	0.389	0.430	1.084	77.127	1160.943	1223.752	1224.516
75% Perc =	2.079	6.216	9.717	15.812	17.551	0.053	0.158	0.247	0.402	0.447	1.185	83.888	1223.616	1283.810	1285.019
80% Perc =	2.189	6.553	10.077	16.461	18.190	0.056	0.167	0.256	0.419	0.463	1.309	92.130	1290.376	1352.089	1352.599
85% Perc =	2.310	6.936	10.503	17.243	18.919	0.059	0.176	0.267	0.439	0.481	1.464	102.500	1374.826	1433.137	1434.821
90% Perc =	2.454	7.349	11.015	18.222	19.859	0.062	0.187	0.280	0.464	0.505	1.648	115.740	1480.778	1543.281	1544.711
95% Perc =	2.651	7.951	11.798	19.425	21.134	0.067	0.202	0.300	0.494	0.538	1.947	137.345	1648.628	1722.448	1723.803
Maximum =	3.228	9.355	14.478	23.476	25.856	0.082	0.238	0.368	0.597	0.658	3.407	227.697	2504.288	2561.302	2561.494

Table 4.5.18
Sale All non Arctic LOF Average Platforms + Wells - Monte Carlo Results

Sale All non Arctic Platforms + Wells	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills
All years Average LOF	**Frequency Spills per 10^3years**					**Frequency Spills per 10^9 bbl Produced**					**Spill Index [bbl]**				
Mean =	23.55	6.74	10.02	16.77	40.32	0.60	0.17	0.26	0.43	1.03	10.69	70.97	1001.41	1072.38	1083.08
Std Deviation =	14.87	2.20	2.50	4.54	15.56	0.38	0.06	0.06	0.12	0.40	10.29	40.86	368.41	370.09	370.31
Variance =	221.149	4.837	6.226	20.648	242.187	0.143	0.003	0.004	0.013	0.157	105.901	1669.390	135722.400	136968.400	137133.100
Skewness =	0.56	0.11	0.08	0.11	0.49	0.56	0.11	0.08	0.11	0.49	1.76	0.80	0.49	0.49	0.48
Kurtosis =	2.40	2.68	2.80	2.73	2.48	2.40	2.68	2.80	2.73	2.48	6.64	3.47	3.18	3.19	3.19
Mode =	4.28	8.02	10.69	11.57	27.61	0.11	0.30	0.27	0.36	0.74	4.85	71.50	1014.74	953.94	993.33
Minimum =	0.812	1.108	2.199	3.435	7.754	0.021	0.028	0.056	0.087	0.197	-3.362	-8.368	142.871	169.663	183.146
5% Perc =	4.139	3.105	5.955	9.269	18.988	0.105	0.079	0.152	0.236	0.483	1.069	15.745	452.129	512.618	526.533
10% Perc =	5.794	3.924	6.874	10.925	21.766	0.147	0.100	0.175	0.278	0.554	1.656	24.118	557.093	622.101	633.465
15% Perc =	7.439	4.395	7.430	11.997	23.850	0.189	0.112	0.189	0.305	0.607	2.205	29.976	626.810	691.172	701.853
20% Perc =	9.188	4.813	7.887	12.776	25.743	0.234	0.122	0.201	0.325	0.655	2.759	35.187	680.626	749.397	759.462
25% Perc =	10.988	5.190	8.251	13.556	27.736	0.280	0.132	0.210	0.345	0.706	3.385	40.384	734.241	805.946	814.987
30% Perc =	12.880	5.506	8.662	14.242	29.618	0.328	0.140	0.220	0.362	0.754	4.003	45.107	783.553	854.364	864.136
35% Perc =	14.717	5.823	8.989	14.877	31.543	0.374	0.148	0.229	0.379	0.803	4.729	49.841	831.082	904.190	913.675
40% Perc =	16.719	6.131	9.327	15.490	33.742	0.425	0.156	0.237	0.394	0.859	5.479	54.926	876.794	950.606	962.593
45% Perc =	18.812	6.438	9.686	16.110	35.806	0.479	0.164	0.246	0.410	0.911	6.316	59.538	923.222	995.468	1005.630
50% Perc =	21.065	6.712	9.987	16.643	38.237	0.536	0.171	0.254	0.423	0.973	7.249	64.223	971.470	1042.268	1053.644
55% Perc =	23.295	6.994	10.327	17.261	40.556	0.593	0.178	0.263	0.439	1.032	8.331	69.548	1017.226	1090.164	1100.088
60% Perc =	25.653	7.293	10.652	17.861	42.701	0.653	0.186	0.271	0.454	1.087	9.652	75.023	1064.067	1133.646	1144.673
65% Perc =	28.272	7.592	10.945	18.495	45.490	0.719	0.193	0.278	0.471	1.157	11.024	81.168	1118.448	1186.539	1196.464
70% Perc =	31.135	7.920	11.321	19.171	47.987	0.792	0.202	0.288	0.488	1.222	12.485	87.929	1168.733	1245.795	1253.879
75% Perc =	33.996	8.279	11.689	19.836	51.049	0.865	0.211	0.297	0.505	1.299	14.743	94.264	1233.967	1306.528	1316.194
80% Perc =	37.368	8.632	12.124	20.632	54.646	0.951	0.220	0.308	0.525	1.390	16.978	102.830	1300.917	1371.744	1382.050
85% Perc =	41.191	9.074	12.669	21.593	58.601	1.048	0.231	0.322	0.549	1.491	20.298	113.759	1383.158	1452.851	1465.552
90% Perc =	45.637	9.607	13.296	22.710	62.749	1.161	0.244	0.338	0.578	1.597	25.156	127.982	1492.942	1567.140	1577.064
95% Perc =	51.486	10.445	14.237	24.477	68.693	1.310	0.266	0.362	0.623	1.748	32.071	149.955	1660.347	1739.593	1751.937
Maximum =	65.810	13.534	18.243	31.293	86.770	1.674	0.344	0.464	0.796	2.208	66.708	248.854	2505.519	2582.127	2584.949

Table 4.5.19
Sale All non Arctic LOF Average - Monte Carlo Results

Sale All non Arctic	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills	Small and Medium Spills 50-999 bbl	Large Spills 1000-9999 bbl	Huge Spills =>10000 bbl	Significant Spills =>1000 bbl	All Spills
All years Average LOF	**Frequency Spills per 10^3years**					**Frequency Spills per 10^9 bbl Produced**					**Spill Index [bbl]**				
Mean =	38.90	15.65	12.96	28.61	67.51	0.99	0.40	0.33	0.73	1.72	15.23	117.28	1046.74	1164.01	1179.25
Std Deviation =	17.19	5.50	2.98	6.99	18.56	0.44	0.14	0.08	0.18	0.47	10.84	55.31	369.66	373.83	374.08
Variance =	295.659	30.204	8.879	48.830	344.476	0.191	0.020	0.006	0.032	0.223	117.498	3059.356	136647.700	139746.000	139936.500
Skewness =	0.43	0.41	0.10	0.22	0.34	0.43	0.41	0.10	0.22	0.34	1.58	0.71	0.48	0.47	0.47
Kurtosis =	2.58	2.58	2.77	2.73	2.68	2.58	2.58	2.77	2.73	2.68	6.19	3.46	3.18	3.17	3.17
Mode =	34.95	21.29	10.46	20.05	57.90	0.89	0.33	0.27	0.51	1.47	5.05	100.42	1107.27	911.67	913.44
Minimum =	5.055	2.565	3.639	8.379	21.029	0.129	0.065	0.093	0.213	0.535	-2.561	3.874	169.604	210.258	241.041
5% Perc =	13.712	7.710	8.164	17.682	38.957	0.349	0.196	0.208	0.450	0.991	3.519	40.024	493.326	604.694	620.369
10% Perc =	17.492	8.913	9.097	19.805	44.371	0.445	0.227	0.231	0.504	1.129	4.773	52.134	598.245	706.856	722.199
15% Perc =	20.542	9.888	9.832	21.300	47.957	0.523	0.252	0.250	0.542	1.220	5.709	61.065	670.318	778.326	793.822
20% Perc =	23.270	10.737	10.378	22.519	50.956	0.592	0.273	0.264	0.573	1.296	6.665	68.783	728.195	842.446	855.309
25% Perc =	25.665	11.365	10.893	23.568	53.731	0.653	0.289	0.277	0.600	1.367	7.523	75.992	779.158	896.257	910.523
30% Perc =	27.984	12.119	11.324	24.481	56.369	0.712	0.308	0.288	0.623	1.434	8.465	82.231	825.458	941.308	954.951
35% Perc =	30.224	12.827	11.695	25.447	58.754	0.769	0.326	0.298	0.647	1.495	9.336	89.695	872.635	989.932	1004.930
40% Perc =	32.559	13.561	12.083	26.346	61.043	0.828	0.345	0.307	0.670	1.553	10.218	96.255	922.311	1040.194	1055.378
45% Perc =	34.790	14.279	12.483	27.252	63.438	0.885	0.363	0.318	0.693	1.614	11.205	103.845	968.421	1086.033	1102.594
50% Perc =	36.945	15.008	12.842	28.203	65.814	0.940	0.382	0.327	0.718	1.675	12.306	110.362	1015.177	1133.325	1151.631
55% Perc =	39.293	15.824	13.265	29.172	68.521	1.000	0.403	0.338	0.742	1.743	13.502	117.058	1061.010	1183.040	1199.035
60% Perc =	41.833	16.625	13.683	30.164	71.074	1.064	0.423	0.348	0.767	1.808	14.774	124.499	1110.549	1229.535	1243.312
65% Perc =	44.376	17.451	14.094	31.178	73.905	1.129	0.444	0.359	0.793	1.880	16.216	132.374	1161.630	1281.658	1296.791
70% Perc =	47.359	18.463	14.584	32.325	76.846	1.205	0.470	0.371	0.822	1.955	17.697	140.893	1219.407	1337.456	1351.070
75% Perc =	50.816	19.447	15.001	33.401	80.205	1.293	0.495	0.382	0.850	2.041	19.850	150.998	1277.195	1398.623	1410.266
80% Perc =	54.311	20.538	15.517	34.690	83.852	1.382	0.523	0.395	0.883	2.133	22.141	162.442	1346.644	1466.749	1480.705
85% Perc =	58.598	21.959	16.129	36.020	87.919	1.491	0.559	0.410	0.916	2.237	25.357	174.740	1432.382	1552.052	1568.032
90% Perc =	63.424	23.339	16.927	38.027	92.794	1.614	0.594	0.431	0.968	2.361	30.032	191.977	1542.539	1666.080	1679.013
95% Perc =	69.878	25.494	17.897	40.657	100.212	1.778	0.649	0.455	1.034	2.550	37.450	221.039	1711.058	1845.372	1857.471
Maximum =	97.316	34.754	22.812	55.275	134.236	2.476	0.884	0.580	1.406	3.415	81.626	363.159	2588.844	2667.432	2686.384

Table 4.5.20
Composition of Spill Indicators - Sale All non Arctic - Year 2024

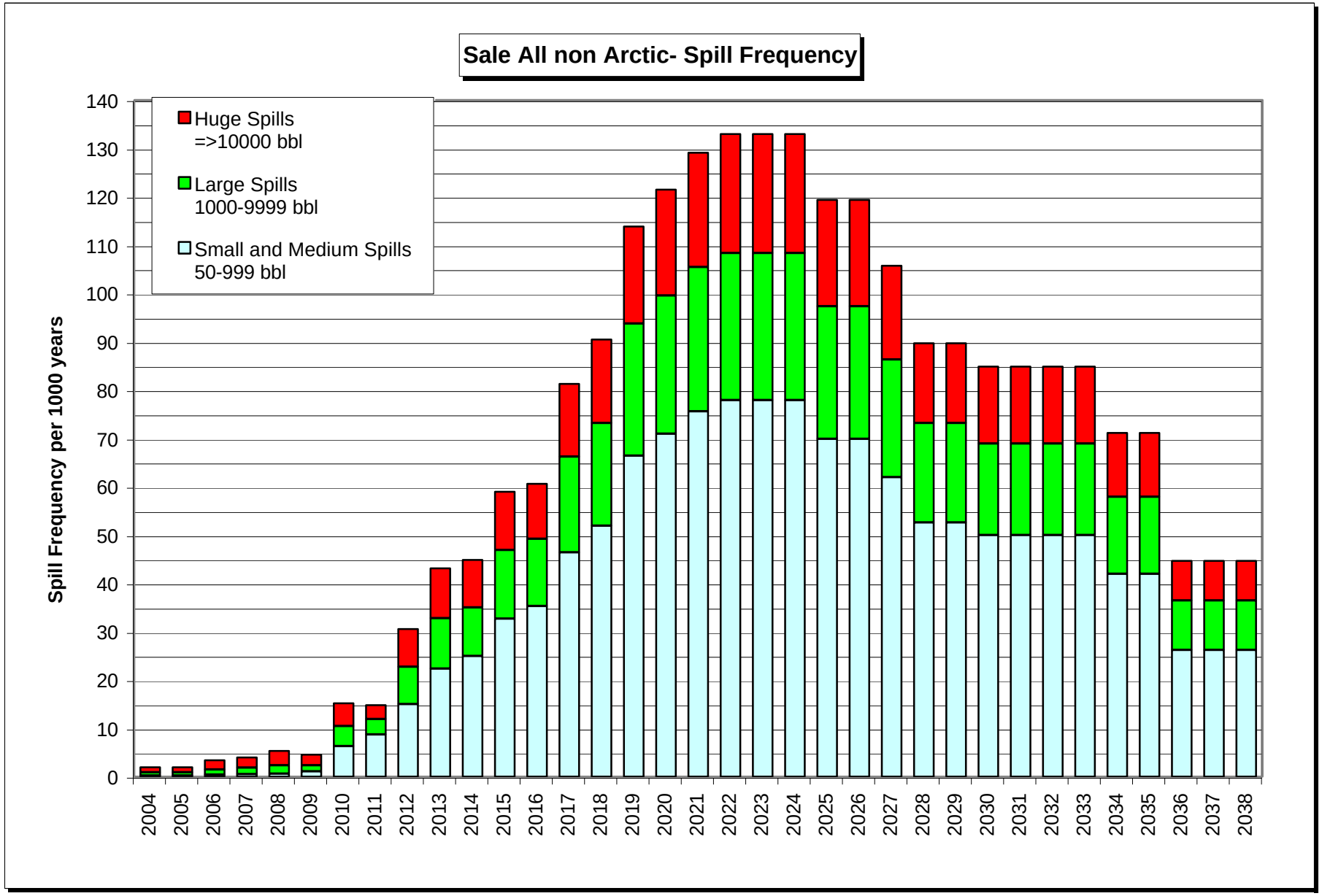
Spill Size	Spill Source									
	P/L		Platforms		Wells		Platforms and Wells		All	
	Sale All non Arctic - Year 2024 Spill Frequency per 10^3 years									
Small and Medium Spills 50-999 bbl	30.403	56%	44.437	86%	3.020	11%	47.457	60%	77.859	59%
Large Spills 1000-9999 bbl	17.701	33%	3.703	7%	9.059	33%	12.762	16%	30.463	23%
Huge Spills =>10000 bbl	5.831	11%	3.703	7%	15.099	56%	18.802	24%	24.633	19%
Significant Spills =>1000 bbl	23.532	44%	7.406	14%	24.158	89%	31.564	40%	55.096	41%
All Spills	**53.934**	**100%**	**51.843**	**100%**	**27.178**	**100%**	**79.021**	**100%**	**132.955**	**100%**
	Sale All non Arctic - Year 2024 Spill Frequency per 10^9 bbl produced									
Small and Medium Spills 50-999 bbl	0.384	56%	0.561	86%	0.038	11%	0.599	60%	0.983	59%
Large Spills 1000-9999 bbl	0.223	33%	0.047	7%	0.114	33%	0.161	16%	0.385	23%
Huge Spills =>10000 bbl	0.074	11%	0.047	7%	0.191	56%	0.237	24%	0.311	19%
Significant Spills =>1000 bbl	0.297	44%	0.094	14%	0.305	89%	0.399	40%	0.696	41%
All Spills	**0.681**	**100%**	**0.655**	**100%**	**0.343**	**100%**	**0.998**	**100%**	**1.679**	**100%**
	Sale All non Arctic - Year 2024 Spill Index [bbl]									
Small and Medium Spills 50-999 bbl	9	5%	20	33%	2	0%	22	1%	31	1%
Large Spills 1000-9999 bbl	92	48%	21	34%	112	6%	133	7%	224	10%
Huge Spills =>10000 bbl	91	47%	21	34%	1827	94%	1848	92%	1938	88%
Significant Spills =>1000 bbl	182	95%	42	67%	1939	100%	1981	99%	2163	99%
All Spills	**191**	**100%**	**62**	**100%**	**1941**	**100%**	**2002**	**100%**	**2194**	**100%**

Spill Source	Spill Size									
	S+M 50-999 bbl		Large 1000-9999 bbl		Huge =>10000 bbl		Significant =>1000 bbl		All Spills	
	Sale All non Arctic - Year 2024 Spill Frequency per 10^3 years									
P/L	30.403	39%	17.701	58%	5.831	24%	23.532	43%	53.934	41%
Platforms	44.437	57%	3.703	12%	3.703	15%	7.406	13%	51.843	39%
Wells	3.020	4%	9.059	30%	15.099	61%	24.158	44%	27.178	20%
Platforms and Wells	47.457	61%	12.762	42%	18.802	76%	31.564	57%	79.021	59%
All	**77.859**	**100%**	**30.463**	**100%**	**24.633**	**100%**	**55.096**	**100%**	**132.955**	**100%**
	Sale All non Arctic - Year 2024 Spill Frequency per 10^9 bbl produced									
P/L	0.384	39%	0.223	58%	0.074	24%	0.297	43%	0.681	41%
Platforms	0.561	57%	0.047	12%	0.047	15%	0.094	13%	0.655	39%
Wells	0.038	4%	0.114	30%	0.191	61%	0.305	44%	0.343	20%
Platforms and Wells	0.599	61%	0.161	42%	0.237	76%	0.399	57%	0.998	59%
All	**0.983**	**100%**	**0.385**	**100%**	**0.311**	**100%**	**0.696**	**100%**	**1.679**	**100%**
	Sale All non Arctic - Year 2024 Spill Index [bbl]									
P/L	9	29%	92	41%	91	5%	182	8%	191	9%
Platforms	20	65%	21	9%	21	1%	42	2%	62	3%
Wells	2	5%	112	50%	1827	94%	1939	90%	1941	88%
Platforms and Wells	22	71%	133	59%	1848	95%	1981	92%	2002	91%
All	**31**	**100%**	**224**	**100%**	**1938**	**100%**	**2163**	**100%**	**2194**	**100%**

Table 4.5.21
Composition of Spill Indicators - Sale All non Arctic - LOF Average

Spill Size	Spill Source									
	P/L		Platforms		Wells		Platforms and Wells		All	
	Sale All non Arctic - LOF Average Spill Frequency per 10^3 years									
Small and Medium Spills 50-999 bbl	15.351	56%	21.910	86%	1.639	11%	23.549	58%	38.900	58%
Large Spills 1000-9999 bbl	8.909	33%	1.826	7%	4.917	33%	6.743	17%	15.653	23%
Huge Spills =>10000 bbl	2.931	11%	1.826	7%	8.199	56%	10.024	25%	12.956	19%
Significant Spills =>1000 bbl	11.840	44%	3.652	14%	13.116	89%	16.768	42%	28.608	42%
All Spills	**27.192**	**100%**	**25.562**	**100%**	**14.755**	**100%**	**40.317**	**100%**	**67.508**	**100%**
	Sale All non Arctic - LOF Average Spill Frequency per 10^9 bbl produced									
Small and Medium Spills 50-999 bbl	0.391	56%	0.557	86%	0.042	11%	0.599	58%	0.990	58%
Large Spills 1000-9999 bbl	0.227	33%	0.046	7%	0.125	33%	0.172	17%	0.398	23%
Huge Spills =>10000 bbl	0.075	11%	0.046	7%	0.209	56%	0.255	25%	0.330	19%
Significant Spills =>1000 bbl	0.301	44%	0.093	14%	0.334	89%	0.427	42%	0.728	42%
All Spills	**0.692**	**100%**	**0.650**	**100%**	**0.375**	**100%**	**1.026**	**100%**	**1.718**	**100%**
	Sale All non Arctic - LOF Average Spill Index [bbl]									
Small and Medium Spills 50-999 bbl	5	5%	10	33%	1	0%	11	1%	15	1%
Large Spills 1000-9999 bbl	46	48%	10	34%	61	6%	71	7%	117	10%
Huge Spills =>10000 bbl	45	47%	10	34%	992	94%	1003	92%	1048	89%
Significant Spills =>1000 bbl	91	95%	21	67%	1053	100%	1074	99%	1165	99%
All Spills	**96**	**100%**	**30**	**100%**	**1054**	**100%**	**1084**	**100%**	**1180**	**100%**

Spill Source	Spill Size									
	S+M 50-999 bbl		Large 1000-9999 bbl		Huge =>10000 bbl		Significant =>1000 bbl		All Spills	
	Sale All non Arctic - LOF Average Spill Frequency per 10^3 years									
P/L	15.351	39%	8.909	57%	2.931	23%	11.840	41%	27.192	40%
Platforms	21.910	56%	1.826	12%	1.826	14%	3.652	13%	25.562	38%
Wells	1.639	4%	4.917	31%	8.199	63%	13.116	46%	14.755	22%
Platforms and Wells	23.549	61%	6.743	43%	10.024	77%	16.768	59%	40.317	60%
All	**38.900**	**100%**	**15.653**	**100%**	**12.956**	**100%**	**28.608**	**100%**	**67.508**	**100%**
	Sale All non Arctic - LOF Average Spill Frequency per 10^9 bbl produced									
P/L	0.391	39%	0.227	57%	0.075	23%	0.301	41%	0.692	40%
Platforms	0.557	56%	0.046	12%	0.046	14%	0.093	13%	0.650	38%
Wells	0.042	4%	0.125	31%	0.209	63%	0.334	46%	0.375	22%
Platforms and Wells	0.599	61%	0.172	43%	0.255	77%	0.427	59%	1.026	60%
All	**0.990**	**100%**	**0.398**	**100%**	**0.330**	**100%**	**0.728**	**100%**	**1.718**	**100%**
	Sale All non Arctic - LOF Average Spill Index [bbl]									
P/L	5	30%	46	39%	45	4%	91	8%	96	8%
Platforms	10	65%	10	9%	10	1%	21	2%	30	3%
Wells	1	6%	61	52%	992	95%	1053	90%	1054	89%
Platforms and Wells	11	70%	71	61%	1003	96%	1074	92%	1084	92%
All	**15**	**100%**	**117**	**100%**	**1048**	**100%**	**1165**	**100%**	**1180**	**100%**


Sale All non Arctic- Spill Frequency
Huge Spills =>10000 bbl
Large Spills 1000-9999 bbl
Small and Medium Spills 50-999 bbl
Spill Frequency per 1000 years
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
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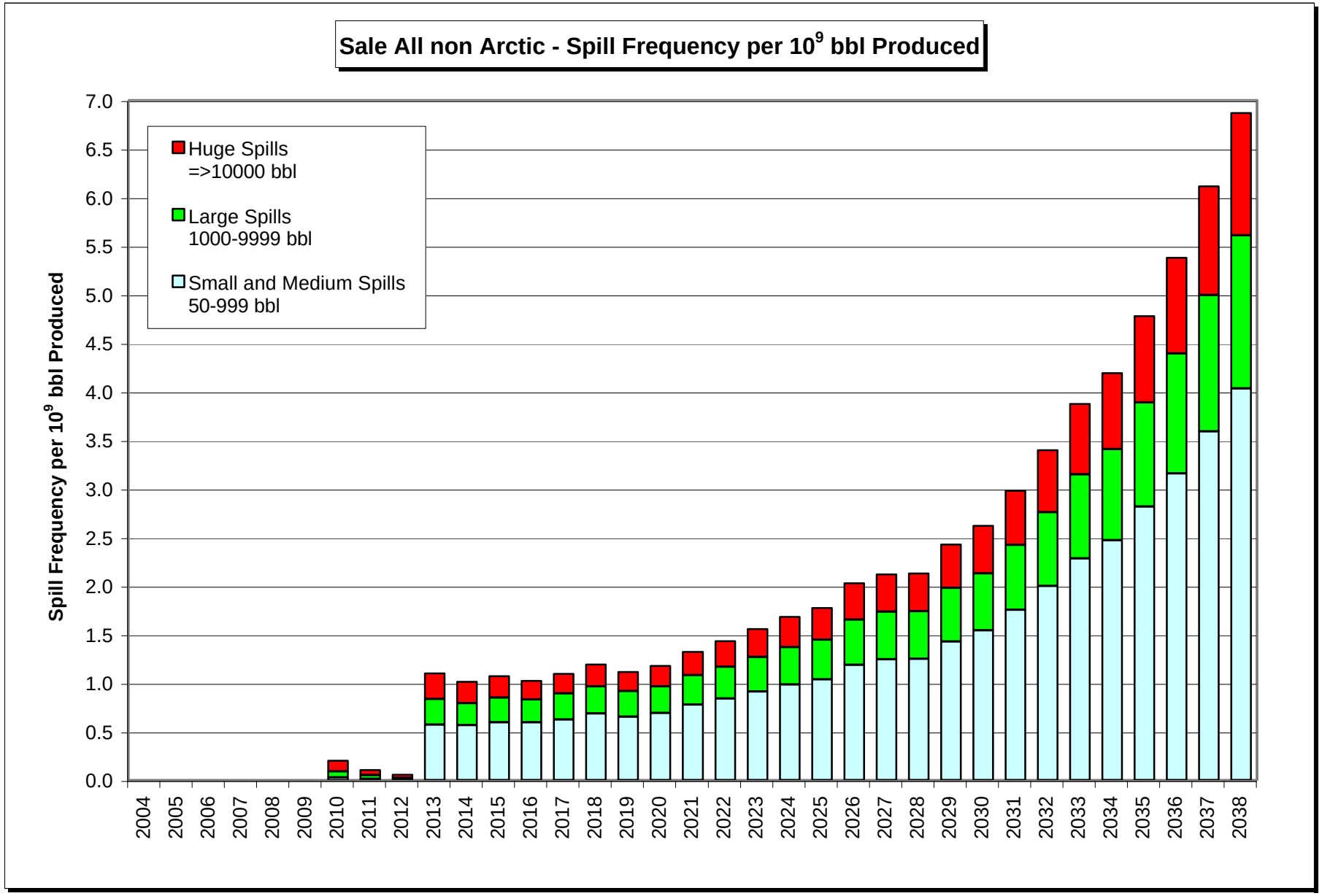
Sale All non Arctic - Spill Frequency per 10^9 bbl Produced
Huge Spills =>10000 bbl
Large Spills 1000-9999 bbl
Small and Medium Spills 50-999 bbl
Spill Frequency per 10^9 bbl Produced
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
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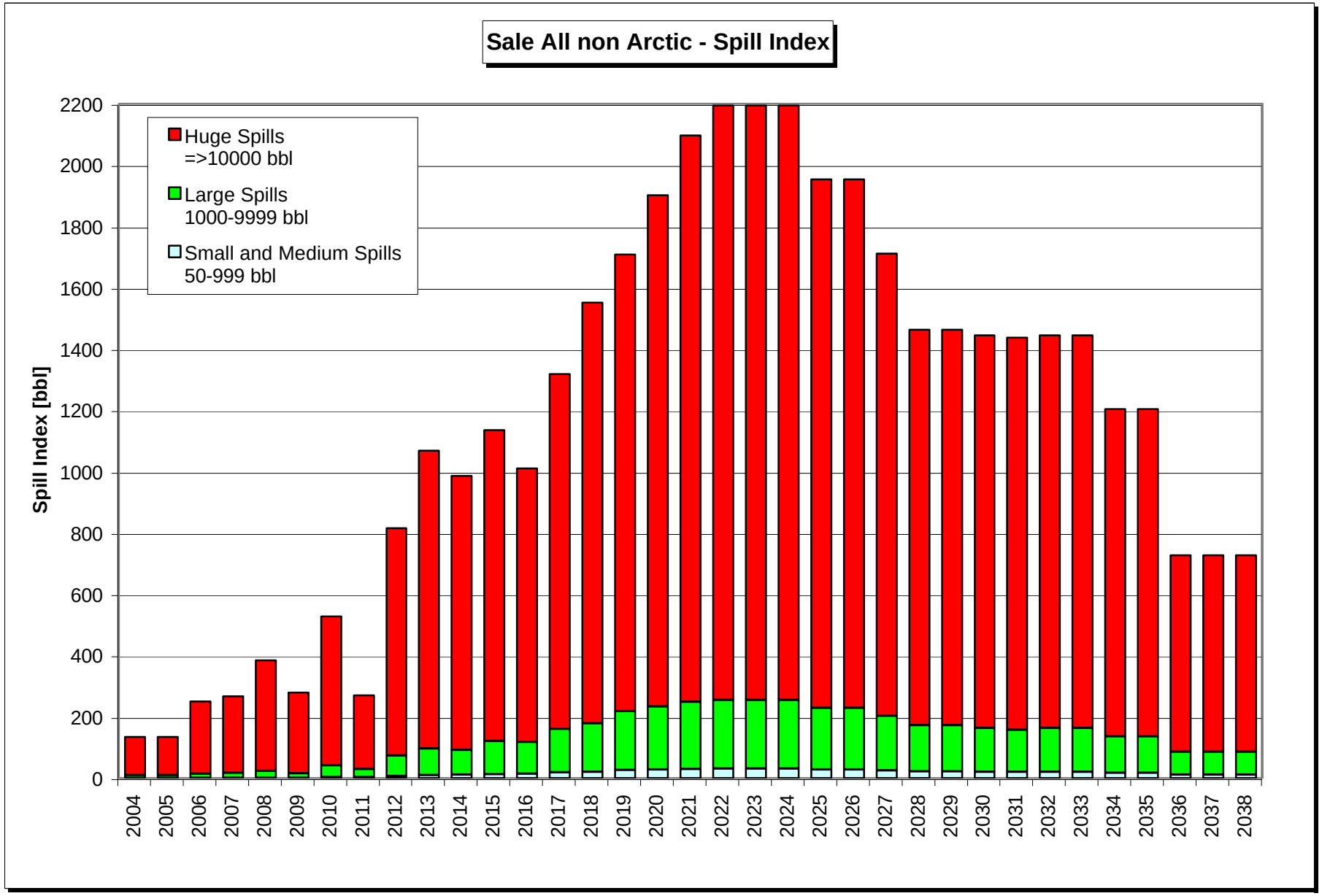
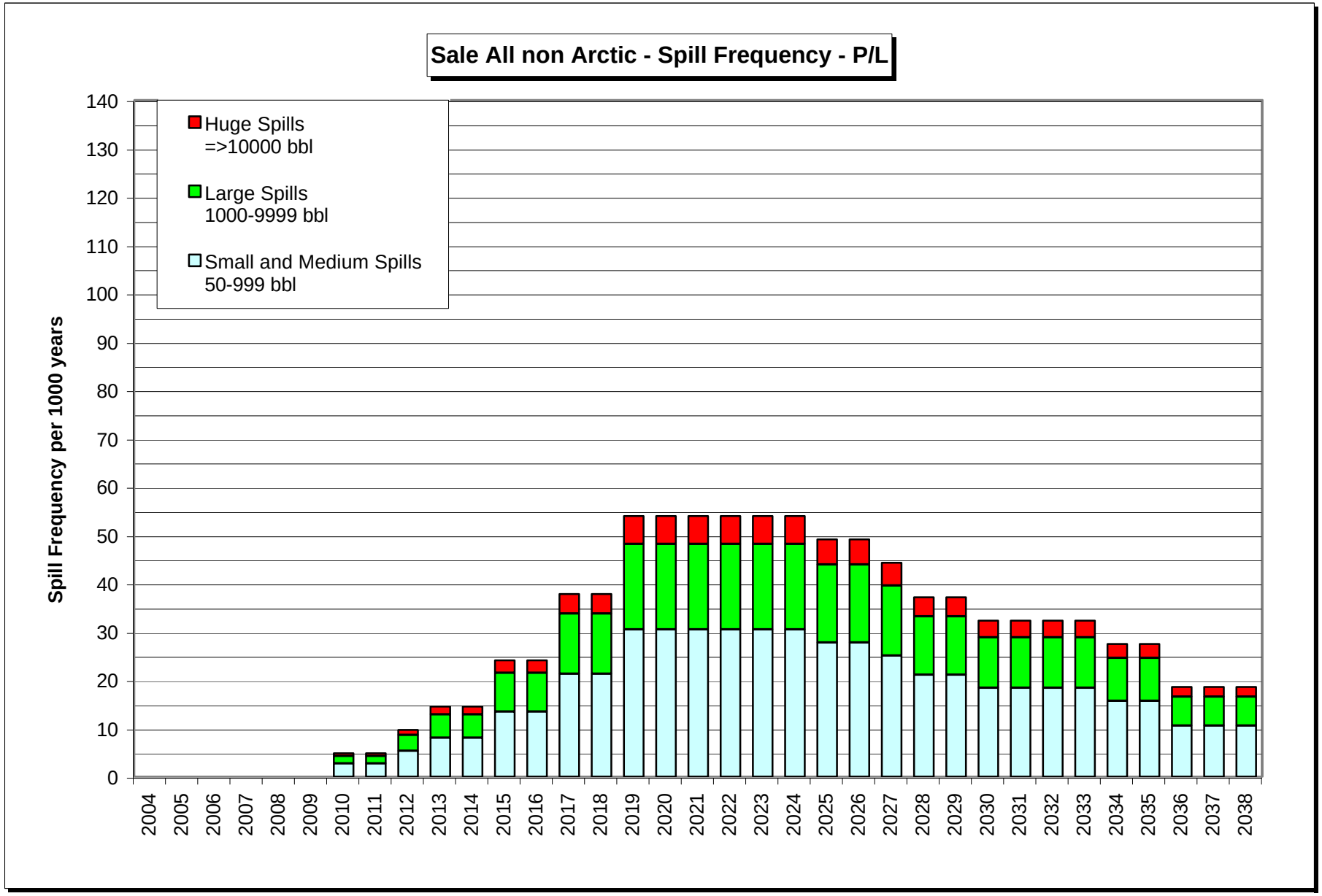
2038


Sale All non Arctic - Spill Index
Huge Spills =>10000 bbl
Large Spills 1000-9999 bbl
Small and Medium Spills 50-999 bbl
Spill Index [bbl]
0
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
2031
2032
2033
2034
2035
2036
2037
2038


Sale All non Arctic - Spill Frequency - P/L
Huge Spills
=>10000 bbl
Large Spills
1000-9999 bbl
Small and Medium Spills
50-999 bbl
Spill Frequency per 1000 years
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
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2027
2028
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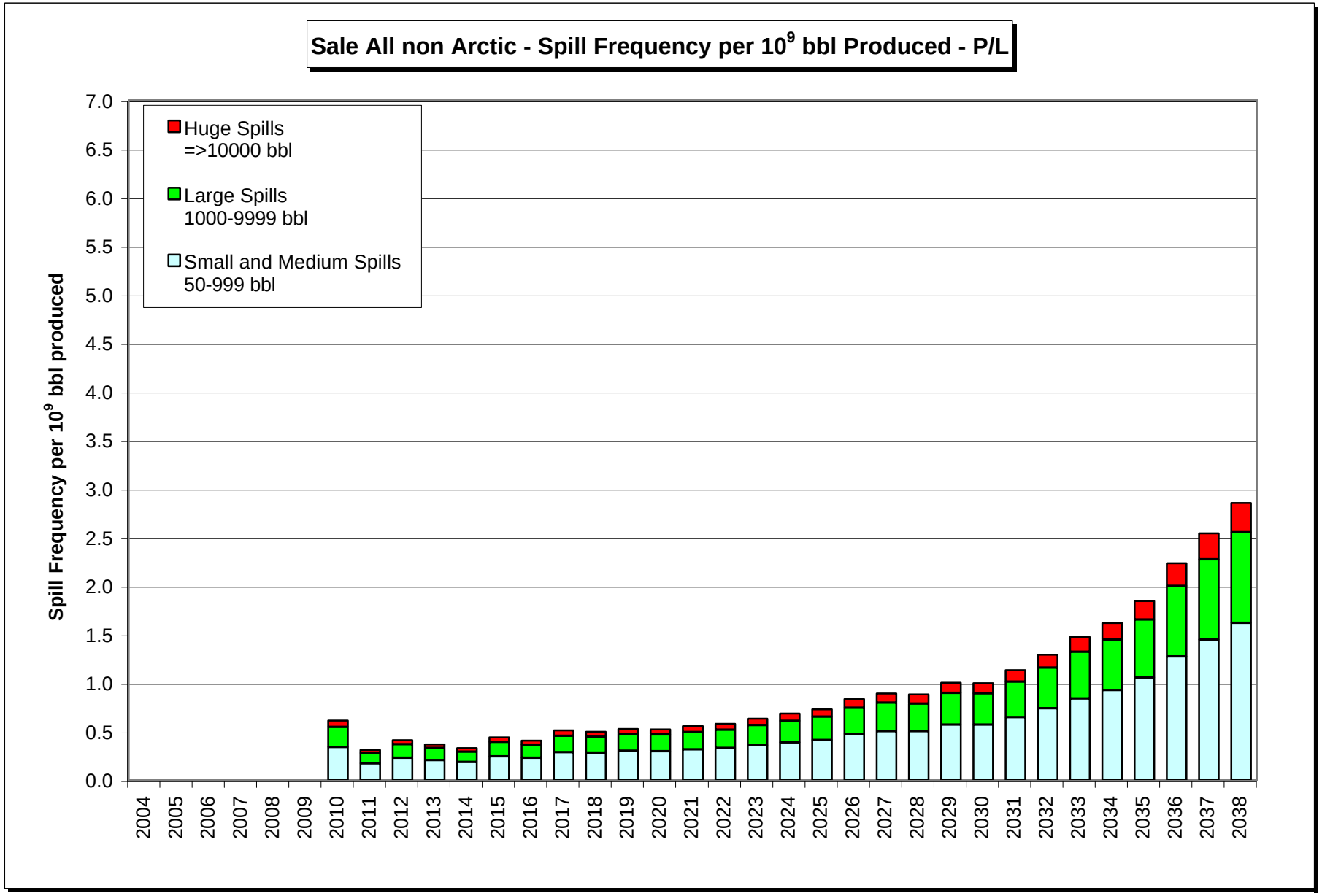
2030
2031
2032
2033
2034
2035
2036
2037
2038


Sale All non Arctic - Spill Frequency per 10^9 bbl Produced - P/L
Huge Spills =>10000 bbl
Large Spills 1000-9999 bbl
Small and Medium Spills 50-999 bbl
Spill Frequency per 10^9 bbl produced
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
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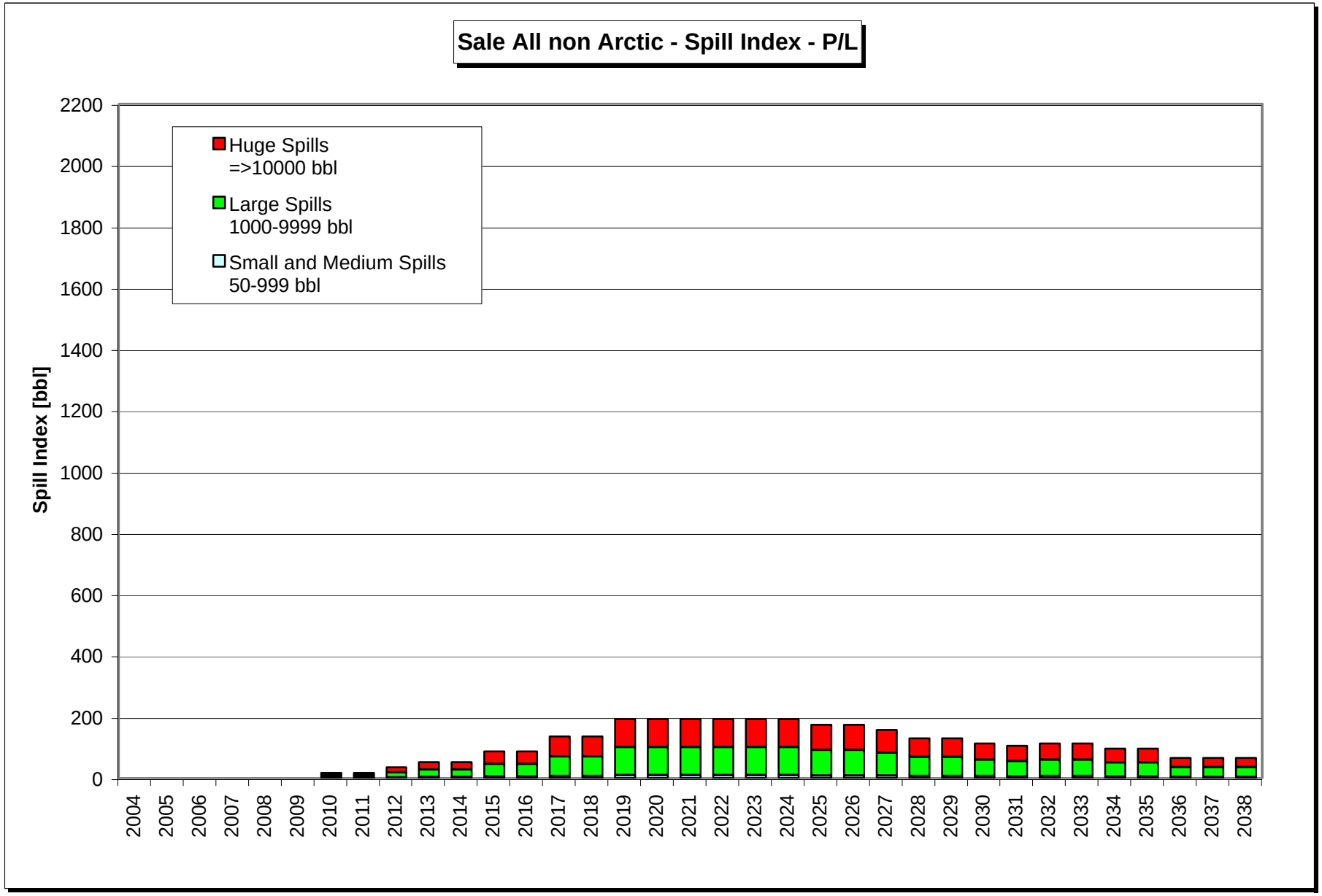
2033
2034
2035
2036
2037
2038


Sale All non Arctic - Spill Index - P/L
Huge Spills
=>10000 bbl
Large Spills
1000-9999 bbl
Small and Medium Spills
50-999 bbl
Spill Index [bbl]
0
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
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2027
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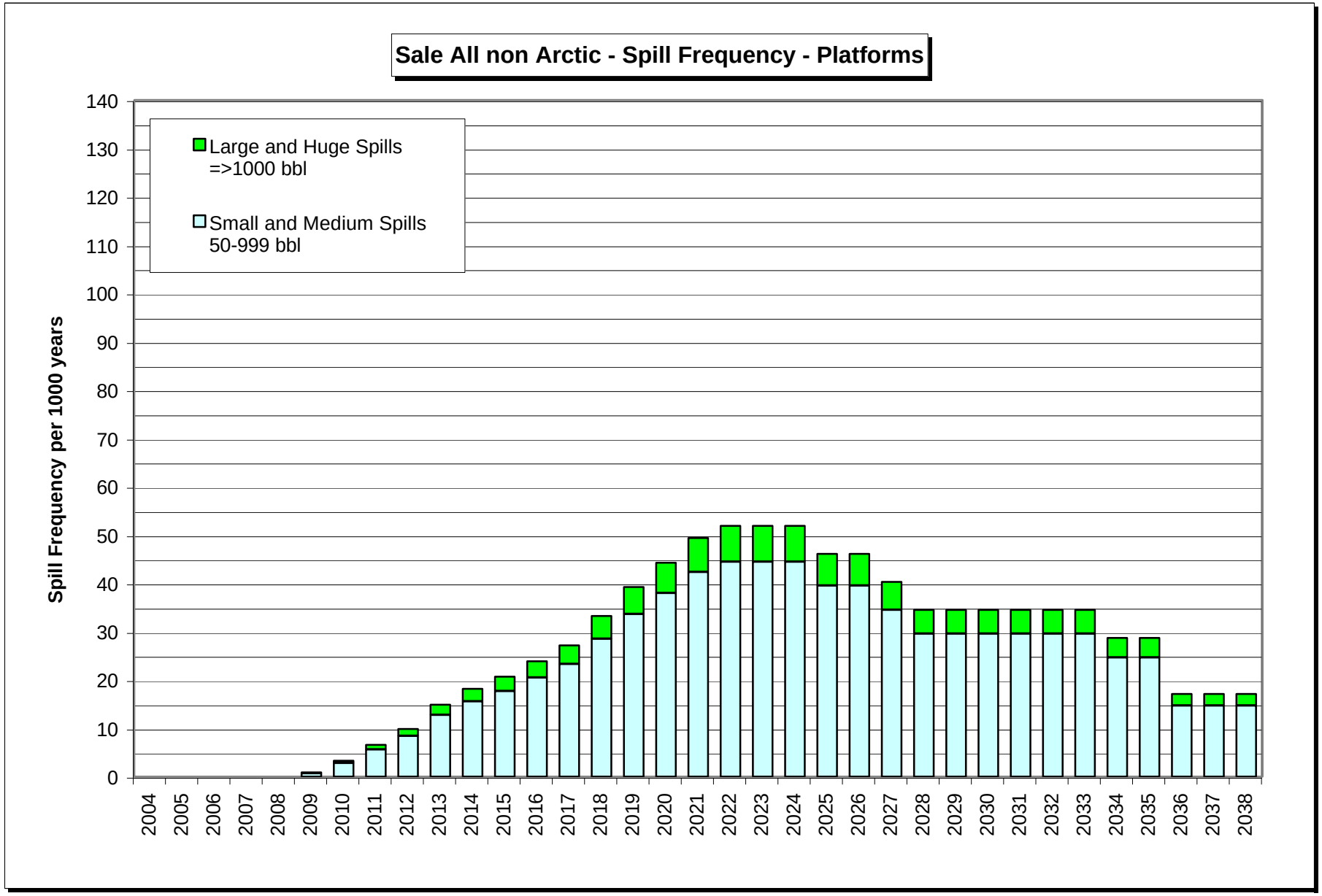
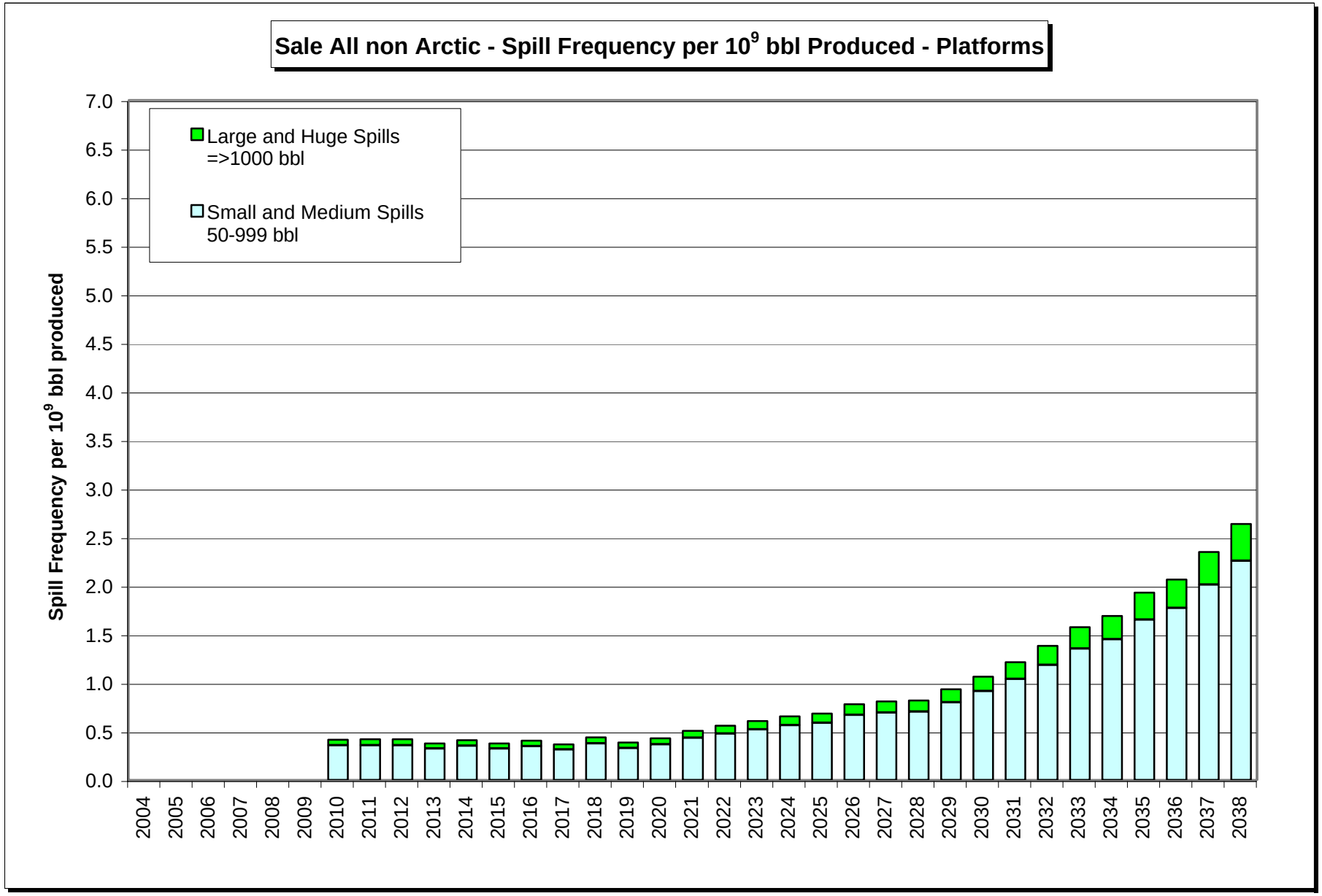
2030
2031
2032
2033
2034
2035
2036
2037
2038


Sale All non Arctic - Spill Frequency - Platforms
Large and Huge Spills =>1000 bbl
Small and Medium Spills 50-999 bbl
Spill Frequency per 1000 years
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
2031
2032
2033
2034
2035
2036
2037
2038


Sale All non Arctic - Spill Frequency per 10^9 bbl Produced - Platforms
Large and Huge Spills =>1000 bbl
Small and Medium Spills 50-999 bbl
Spill Frequency per 10^9 bbl produced
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
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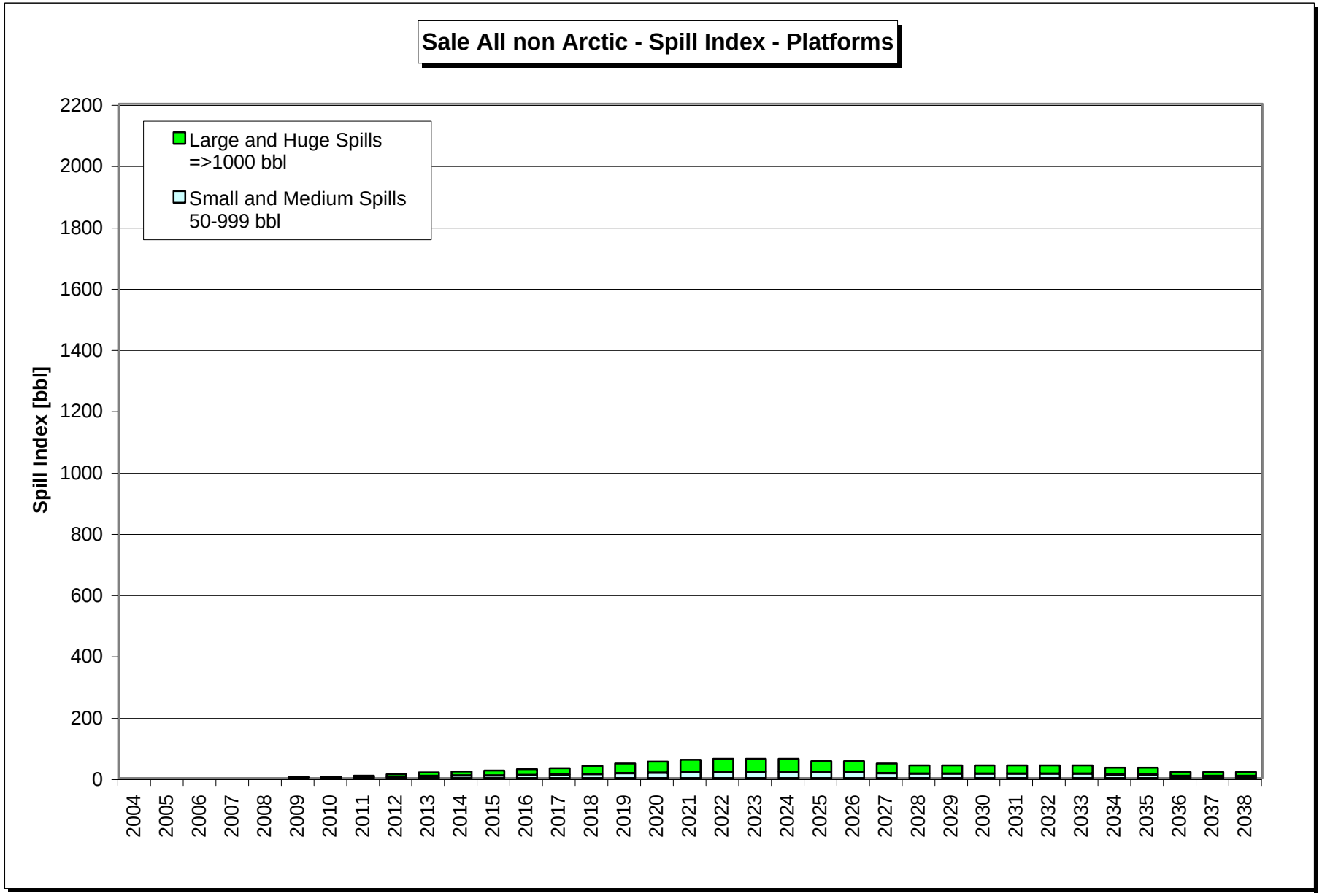
2030
2031
2032
2033
2034
2035
2036
2037
2038


Sale All non Arctic - Spill Index - Platforms
Large and Huge Spills =>1000 bbl
Small and Medium Spills 50-999 bbl
Spill Index [bbl]
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
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2031
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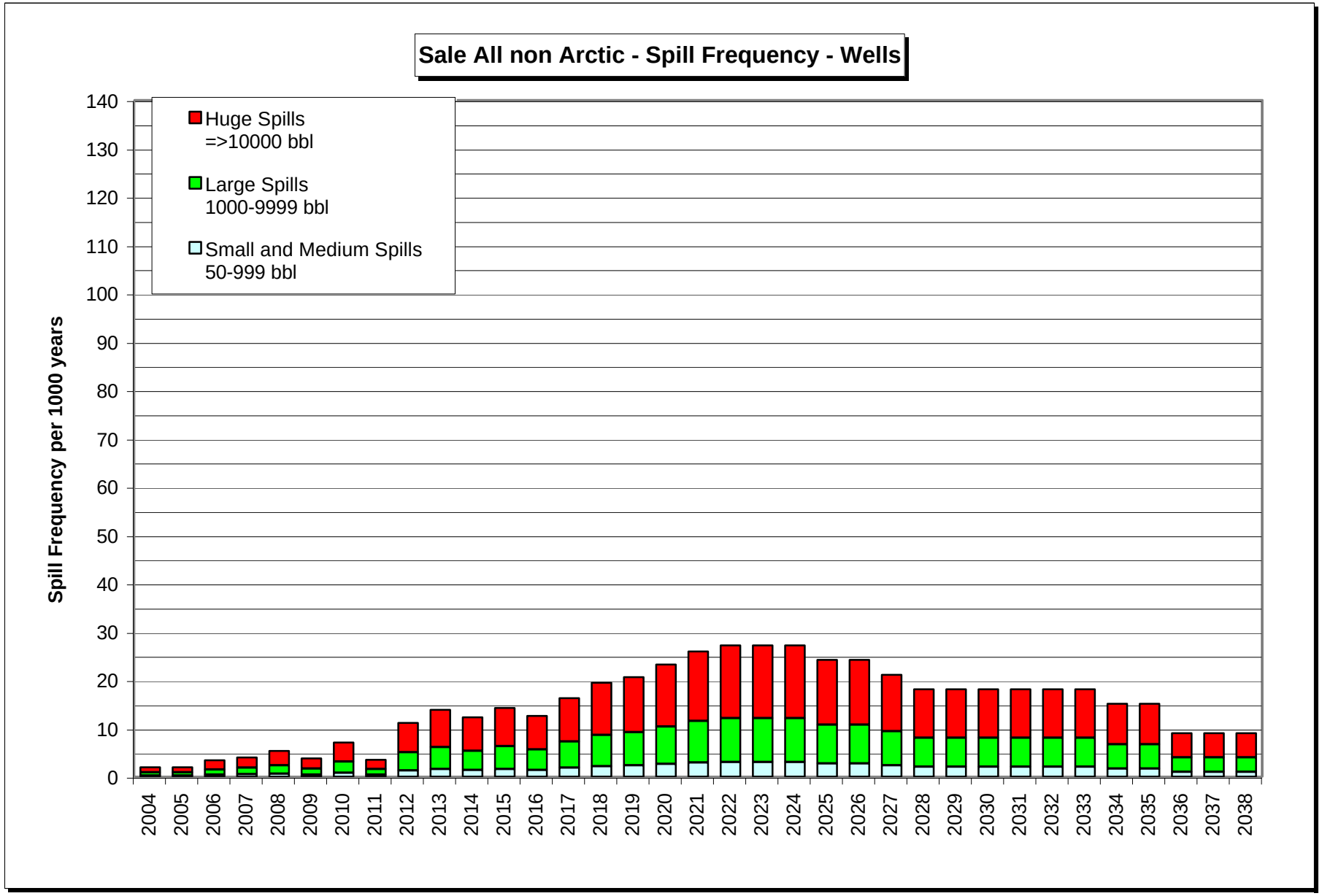
2033
2034
2035
2036
2037
2038


Sale All non Arctic - Spill Frequency - Wells
Huge Spills
=>10000 bbl
Large Spills
1000-9999 bbl
Small and Medium Spills
50-999 bbl
Spill Frequency per 1000 years
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
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2027
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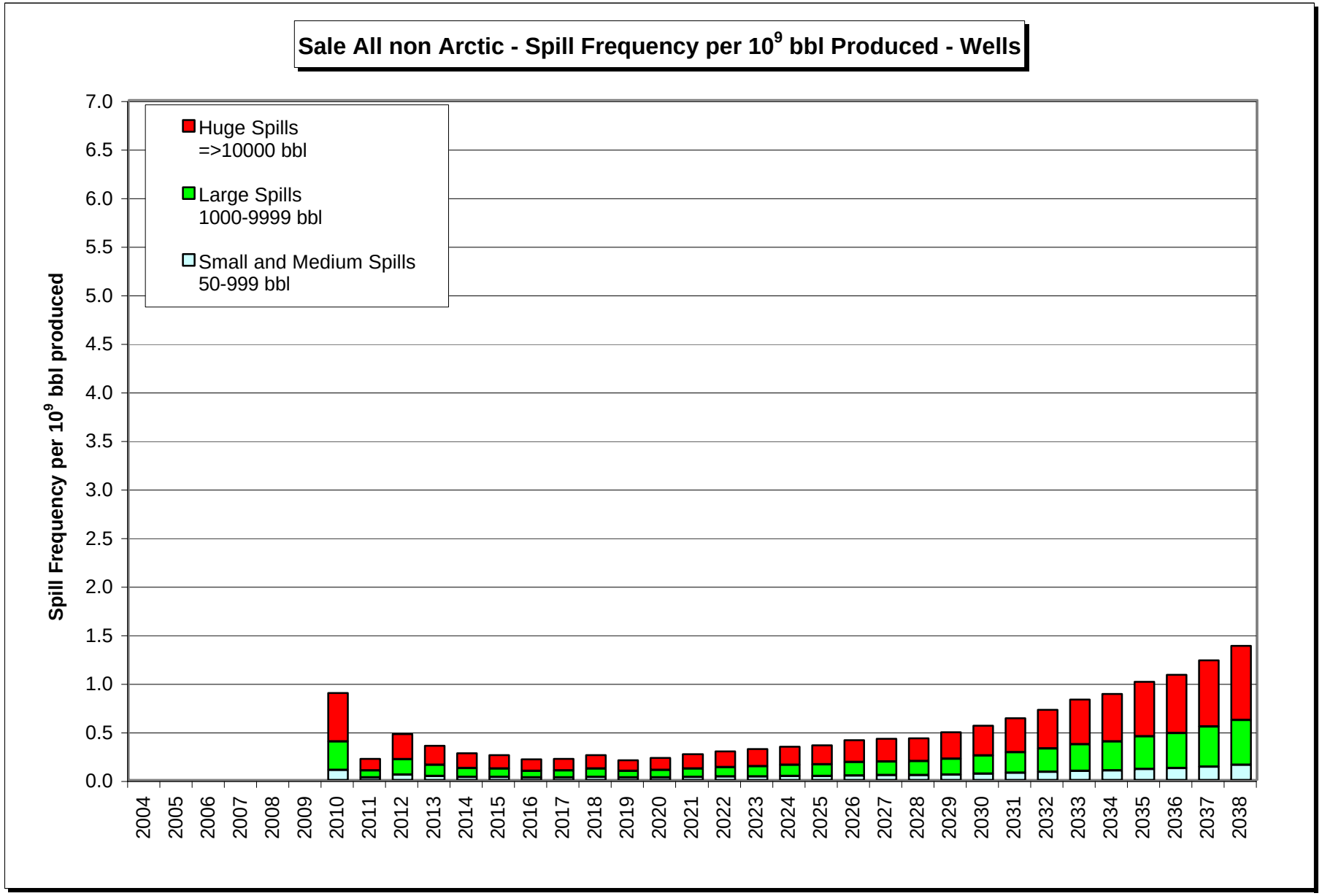
2031
2032
2033
2034
2035
2036
2037
2038


Sale All non Arctic - Spill Frequency per 10^9 bbl Produced - Wells
Huge Spills
=>10000 bbl
Large Spills
1000-9999 bbl
Small and Medium Spills
50-999 bbl
Spill Frequency per 10^9 bbl produced
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
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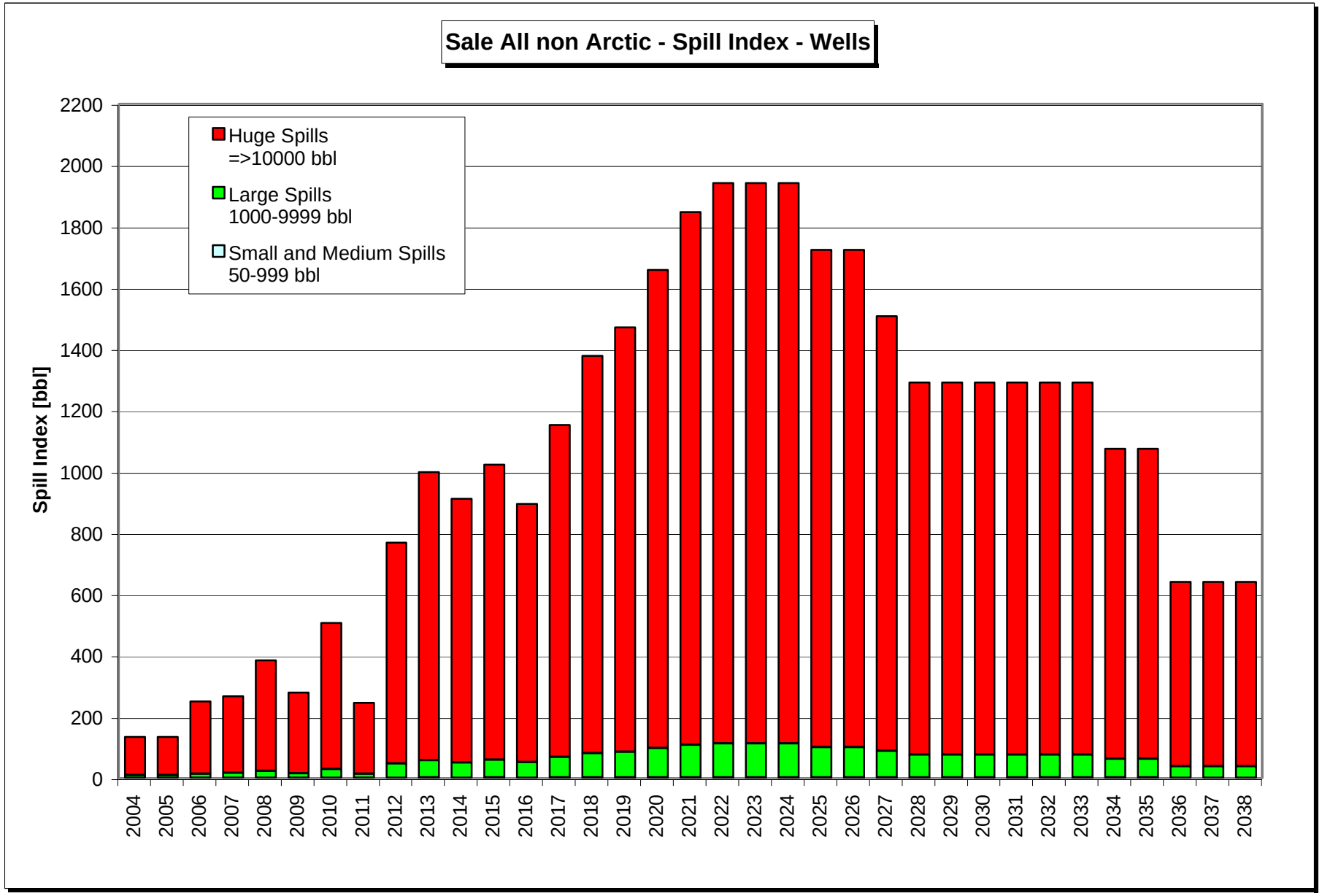
2034
2035
2036
2037
2038


Sale All non Arctic - Spill Index - Wells
Huge Spills
=>10000 bbl
Large Spills
1000-9999 bbl
Small and Medium Spills
50-999 bbl
Spill Index [bbl]
0
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
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2038

Figure 4.5.13 Spill Indicators - CDF - Year 2024

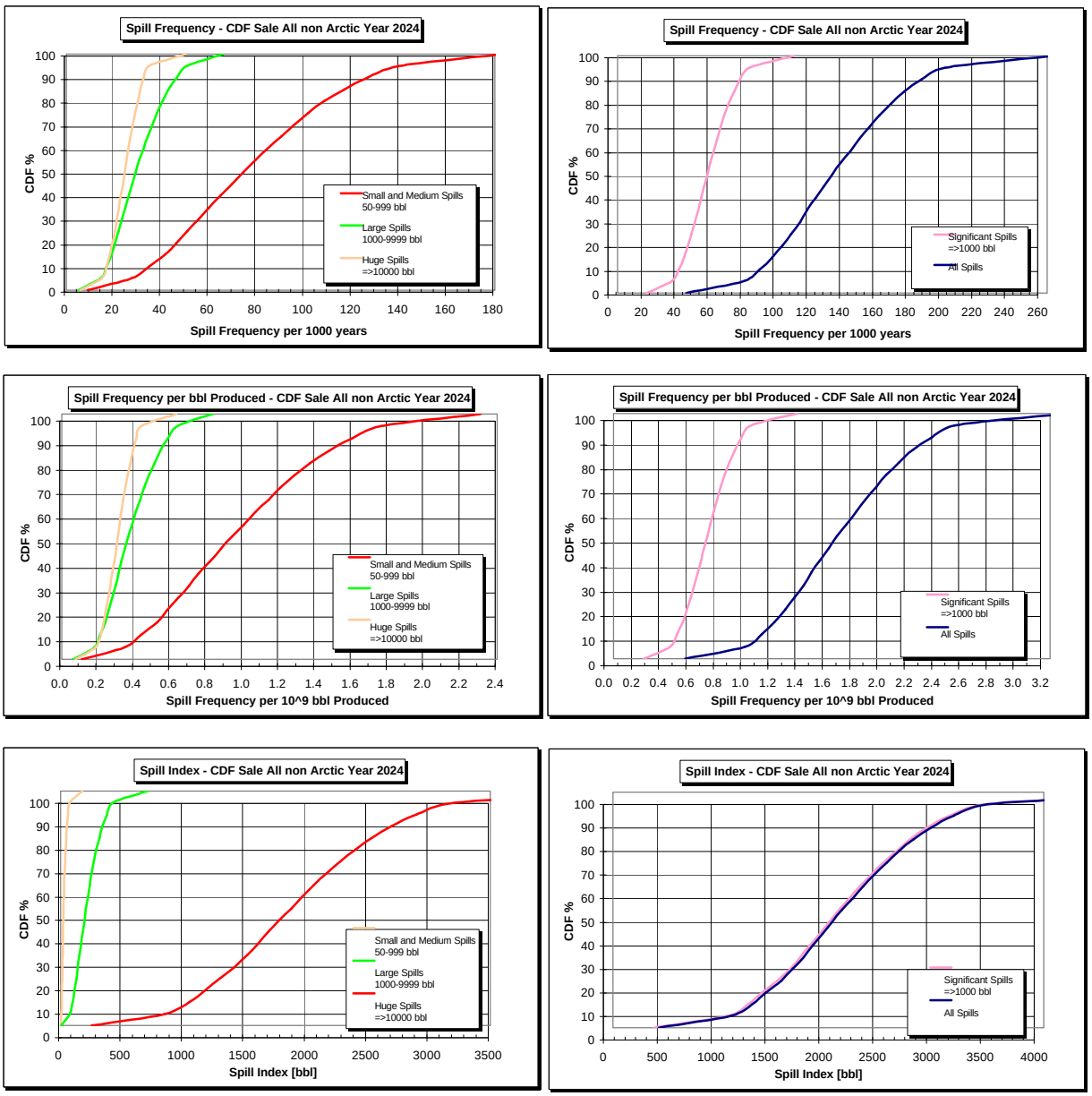


Figure 4.5.14 Spill Frequency - CDF - Sale All non Arctic

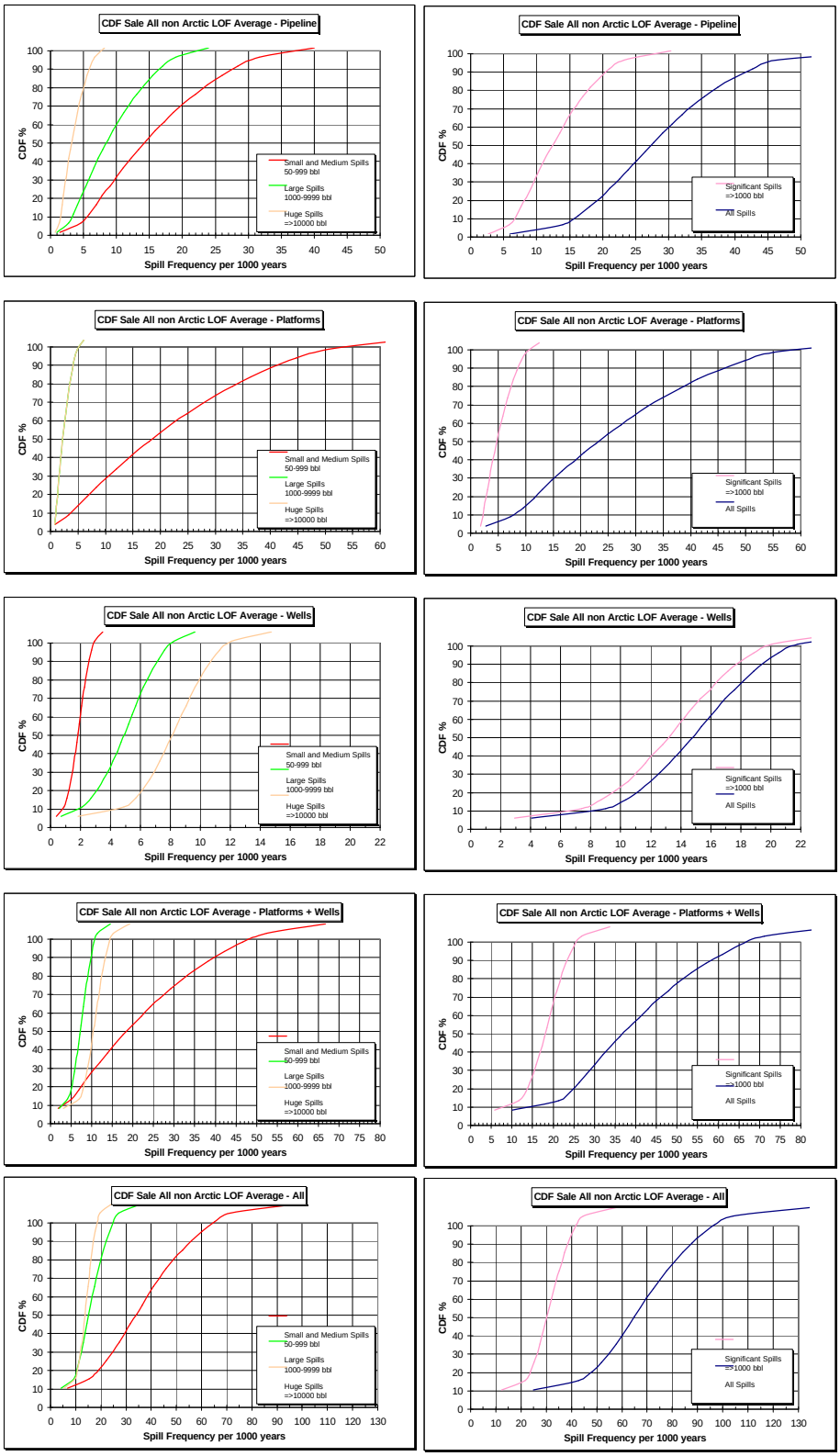
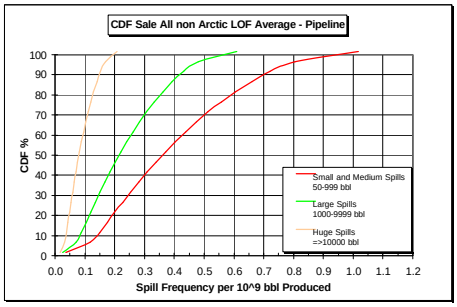
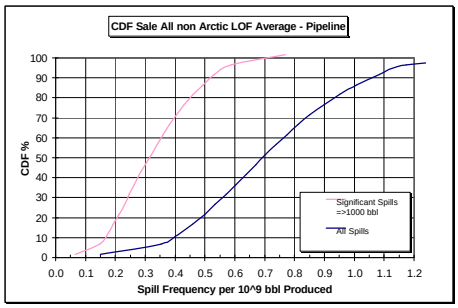
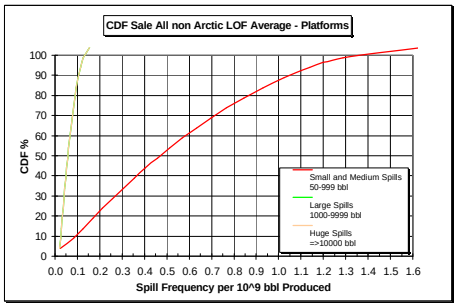
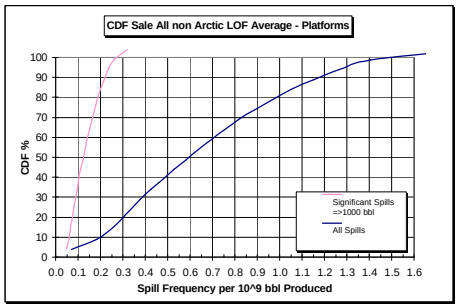


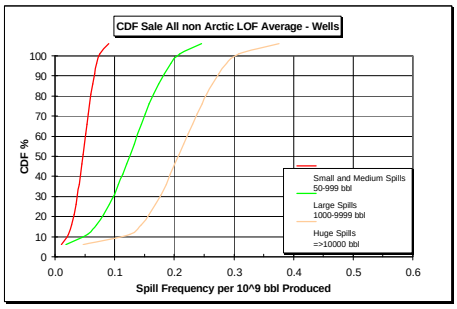
Figure 4.5.15 Spill Frequency per bbl produced - CDF - Sale All non Arctic

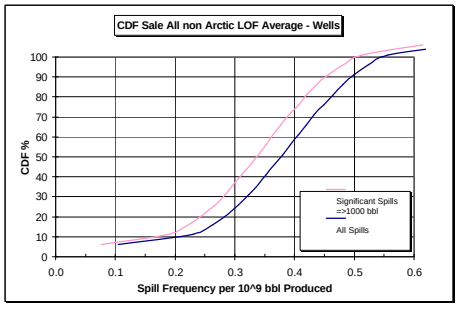


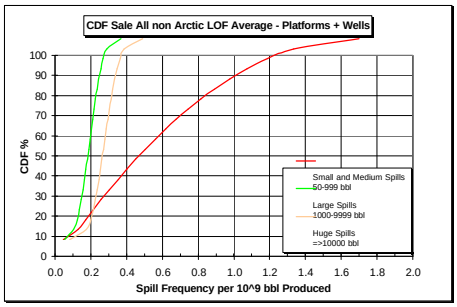


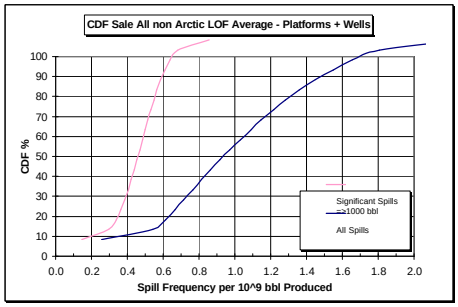


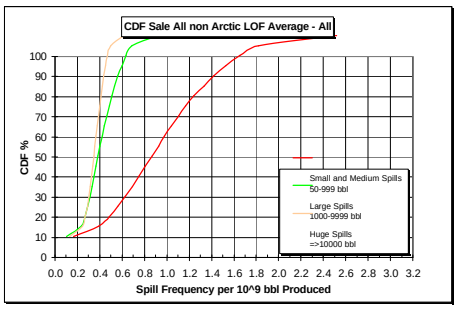












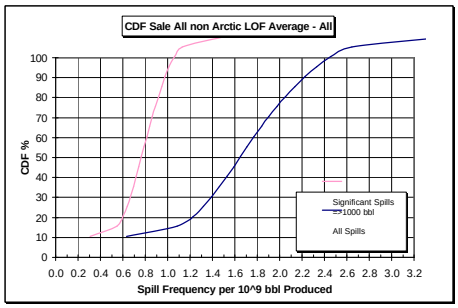


Figure 4.5.16 Spill Index [bbl] - CDF - Sale All non Arctic

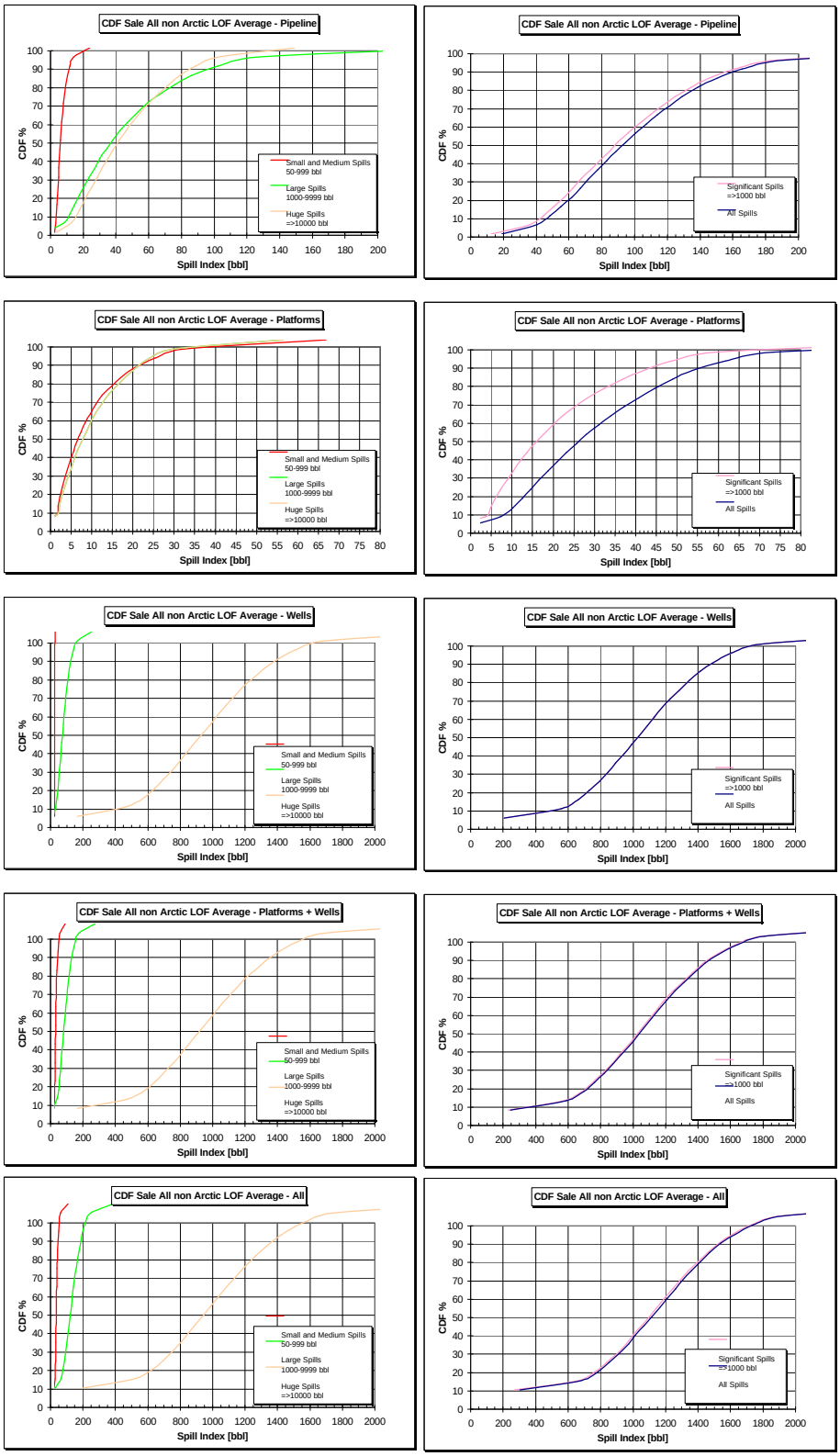
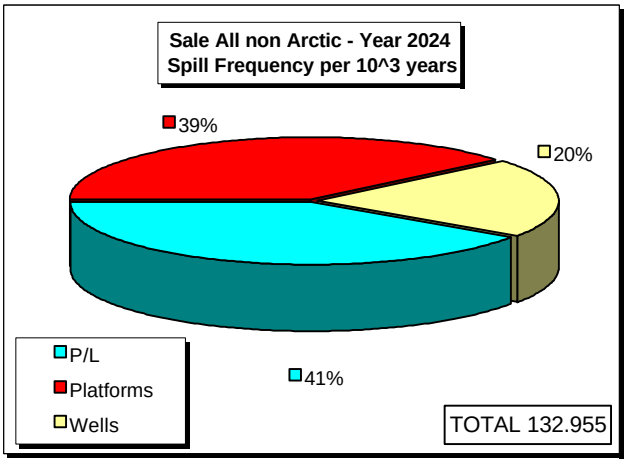
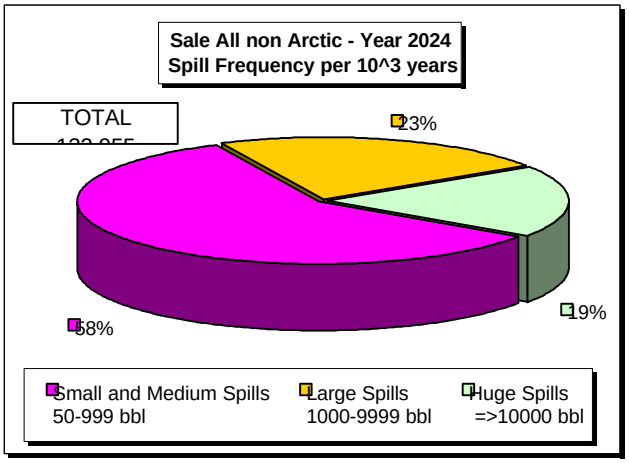


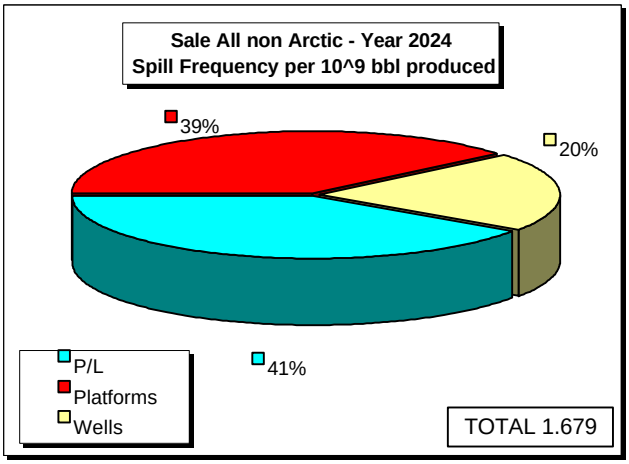
Figure 4.5.17
Sale All non Arctic - Year 2024 - Spill Indicators

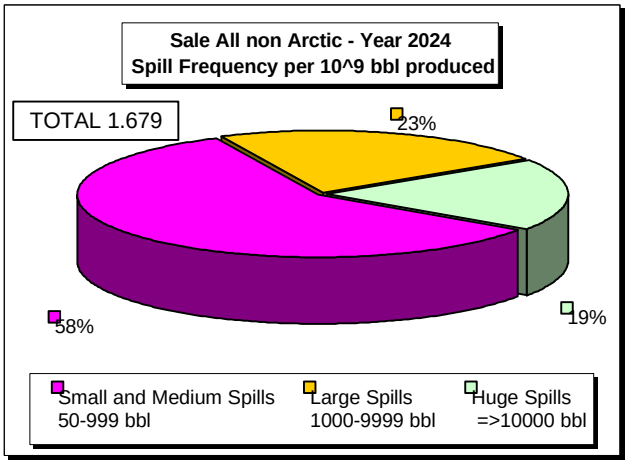
BY SPILL SOURCE

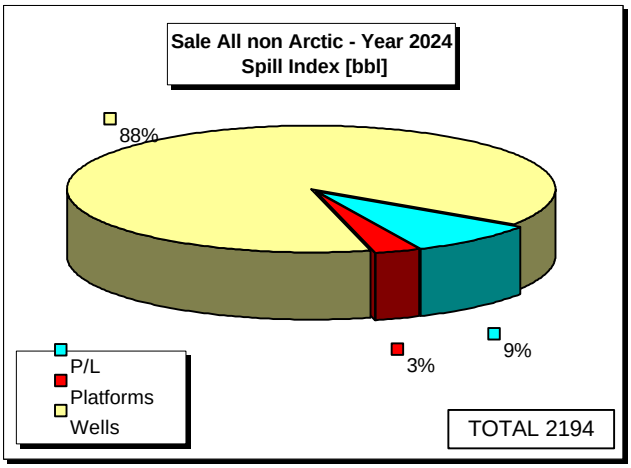


BY SPILL SIZE









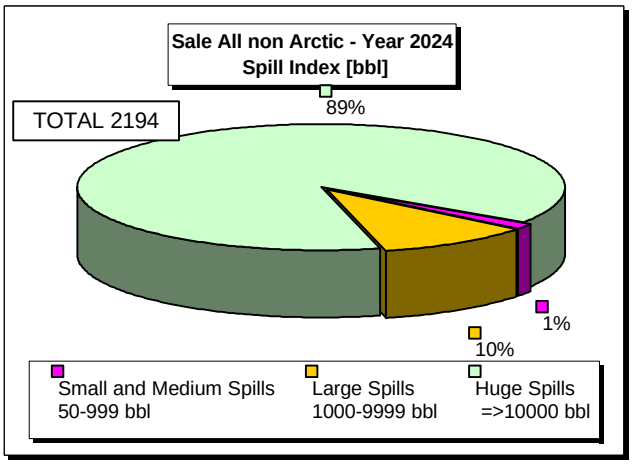
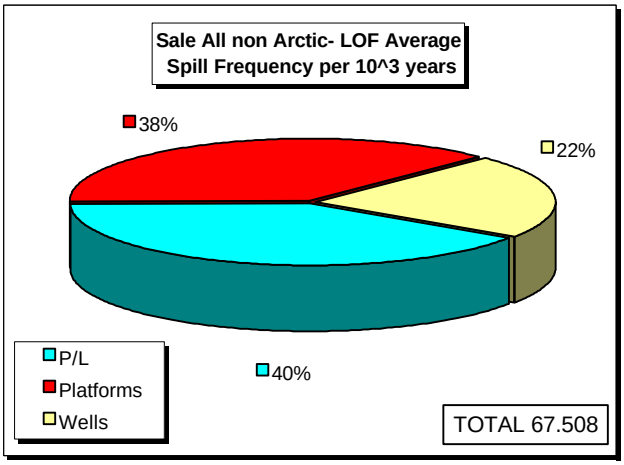
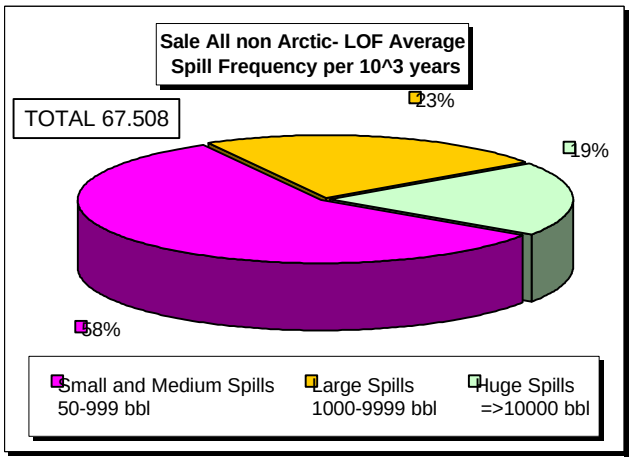


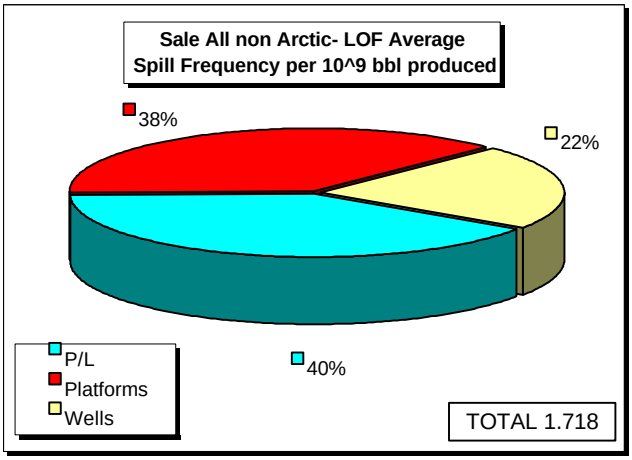
Figure 4.5.18
Sale All non Arctic - LOF Average Spill Indicators

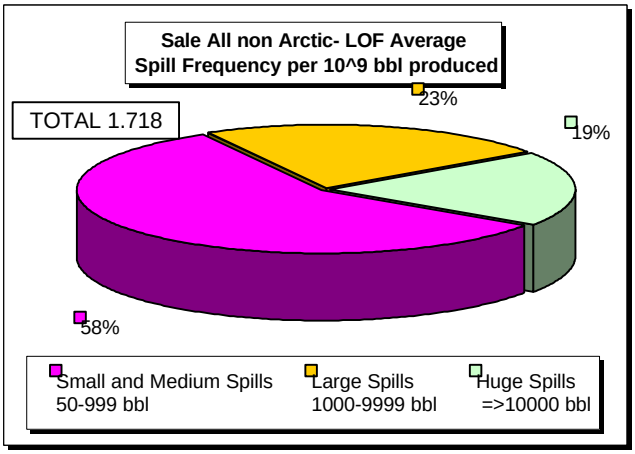
BY SPILL SOURCE

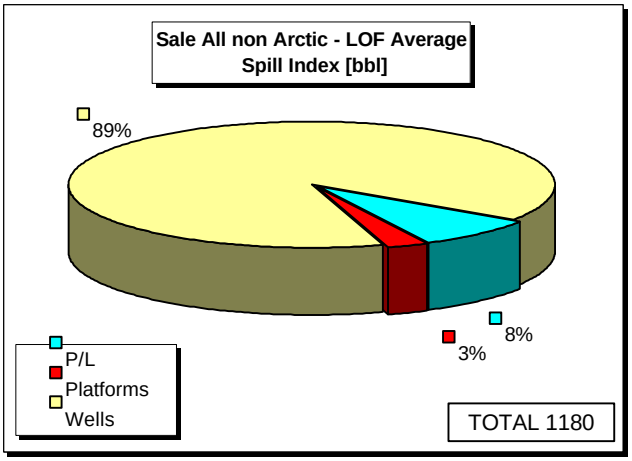


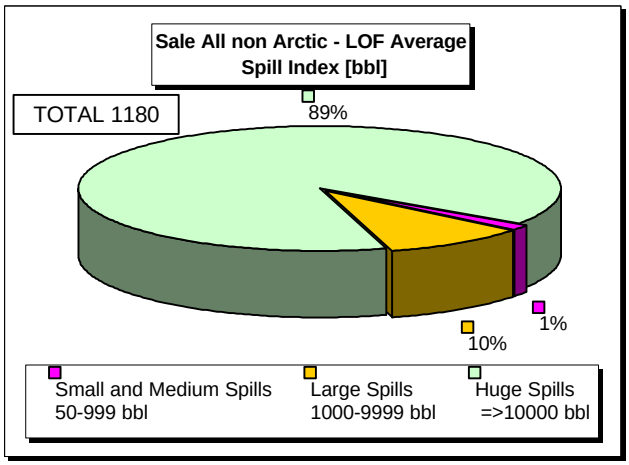
BY SPILL SIZE











APPENDIX 5

Conclusions

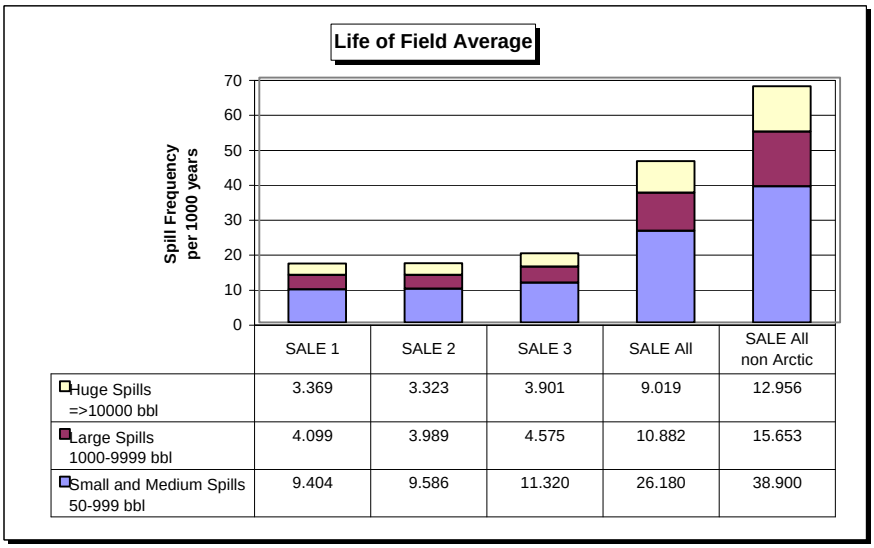
Table 5.1
Summary of Spill Indicators for All Scenarios

Spill Indicators LOF Average	SALE 1			SALE 2			SALE 3			SALE All			SALE All non Arctic		
	Spill Frequency per 10^3 years	Spill Frequency per 10^9 bbl produced	Spill Index [bbl]	Spill Frequency per 10^3 years	Spill Frequency per 10^9 bbl produced	Spill Index [bbl]	Spill Frequency per 10^3 years	Spill Frequency per 10^9 bbl produced	Spill Index [bbl]	Spill Frequency per 10^3 years	Spill Frequency per 10^9 bbl produced	Spill Index [bbl]	Spill Frequency per 10^3 years	Spill Frequency per 10^9 bbl produced	Spill Index [bbl]
Small and Medium Spills 50-999 bbl	9.404	0.612	4	9.586	0.674	4	11.320	0.714	5	26.180	0.666	11	38.900	0.990	15
	56%	**56%**	**1%**	**57%**	**57%**	**1%**	**57%**	**57%**	**1%**	**57%**	**57%**	**1%**	**58%**	**58%**	**1%**
Large Spills 1000-9999 bbl	4.099	0.267	31	3.989	0.281	30	4.575	0.289	35	10.882	0.277	81	15.653	0.398	117
	24%	**24%**	**10%**	**24%**	**24%**	**10%**	**23%**	**23%**	**10%**	**24%**	**24%**	**10%**	**23%**	**23%**	**10%**
Huge Spills =>10000 bbl	3.369	0.219	270	3.323	0.234	268	3.901	0.246	317	9.019	0.229	721	12.956	0.330	1048
	20%	**20%**	**89%**	**20%**	**20%**	**89%**	**20%**	**20%**	**89%**	**20%**	**20%**	**89%**	**19%**	**19%**	**89%**
Significant Spills =>1000 bbl	7.468	0.486	300	7.312	0.514	298	8.476	0.535	352	19.901	0.506	803	28.608	0.728	1165
	44%	**44%**	**99%**	**43%**	**43%**	**99%**	**43%**	**43%**	**99%**	**43%**	**43%**	**99%**	**42%**	**42%**	**99%**
All Spills	16.872	1.098	304	16.897	1.188	302	19.796	1.249	357	46.081	1.172	814	67.508	1.718	1180
	100%	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
Pipeline Spills	5.953	0.388	25	5.899	0.415	23	6.551	0.413	26	15.925	0.405	64	27.192	0.692	96
	35%	**35%**	**8%**	**35%**	**35%**	**8%**	**33%**	**33%**	**7%**	**35%**	**35%**	**8%**	**40%**	**40%**	**8%**
Platform Spills	7.122	0.464	9	7.210	0.507	9	8.751	0.552	11	19.947	0.508	24	25.562	0.650	30
	42%	**42%**	**3%**	**43%**	**43%**	**3%**	**44%**	**44%**	**3%**	**43%**	**43%**	**3%**	**38%**	**38%**	**3%**
Well Spills	3.797	0.247	271	3.787	0.266	271	4.494	0.283	321	10.209	0.260	726	14.755	0.375	1054
	23%	**23%**	**89%**	**22%**	**22%**	**89%**	**23%**	**23%**	**90%**	**22%**	**22%**	**89%**	**22%**	**22%**	**89%**
Platform and Well Spills	10.918	0.711	280	10.998	0.773	279	13.245	0.835	331	30.157	0.767	750	40.317	1.026	1084
	65%	**65%**	**92%**	**65%**	**65%**	**92%**	**67%**	**67%**	**93%**	**65%**	**65%**	**92%**	**60%**	**60%**	**92%**
All Spills	16.872	1.098	304	16.897	1.188	302	19.796	1.249	357	46.081	1.172	814	67.508	1.718	1180
	100%	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

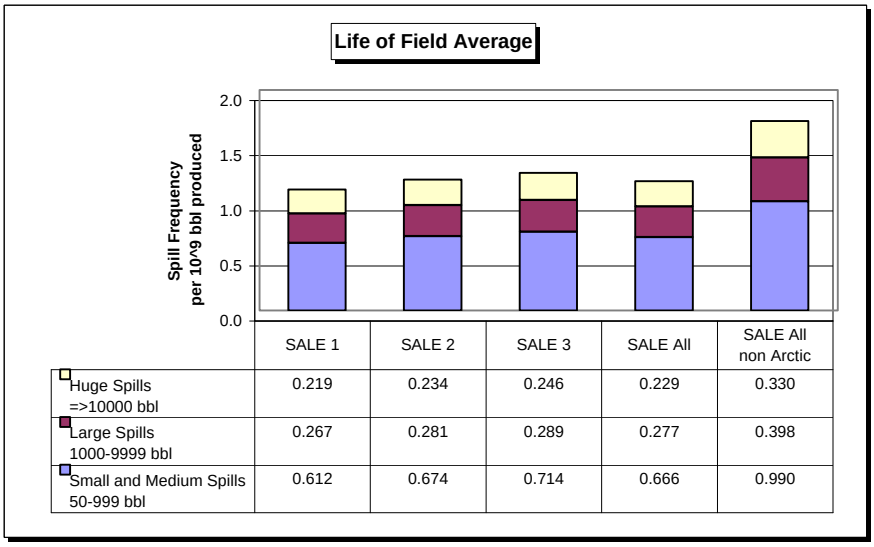
Table 5.2
Summary of Development Scenarios for year 2020

Sale	Year	Water Depth	Exploration Wells	Delineation Wells	Production Platforms		Production Wells		In-use Pipeline Length [miles]						Production MMbbl
									Sum<10"		Sum >=10"		Sum All		
					Incr.	Cum.	Incr.	Cum.	Incr.	Cum.	Incr.	Cum.	Incr.	Cum.	
1	2020	Shallow				2		46				30		30	10.1
		Medium				1		23				10		10	18.9
		Deep													
		Total				**3**		**69**				**40**		40	**29.0**
2	2020	Shallow				1		23				20		20	7.3
		Medium				2		46		5		15		20	28.6
		Deep													
		Total				**3**		**69**		**5**		**35**		40	**35.9**
3	2020	Shallow										15		15	
		Medium				2	20	38		5		15		20	38.6
		Deep													
		Total				**2**	**20**	**38**		**5**		**30**		35	**38.6**
ALL	2020	Shallow				3		69				65		65	17.4
		Medium				5	20	107		10		40		50	86.1
		Deep													
		Total				**8**	**20**	**176**		**10**		**105**		115	**103.5**

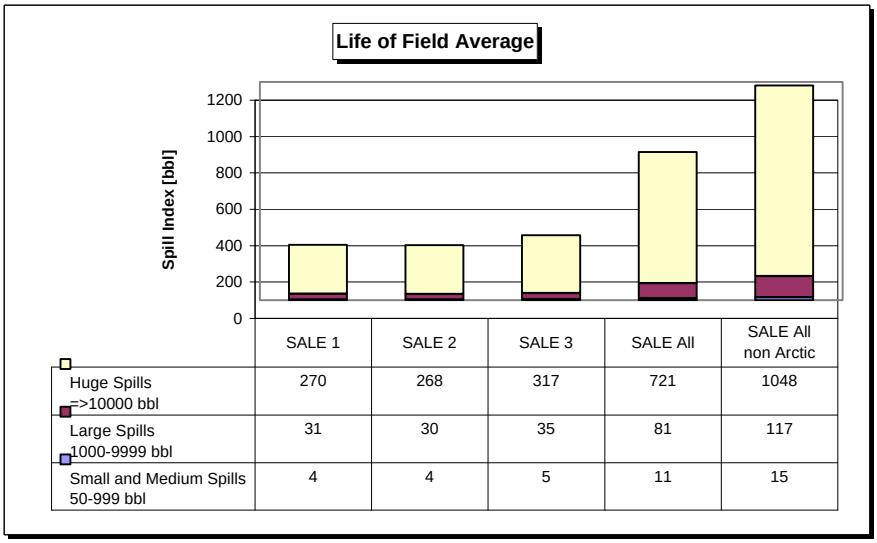
Figure 5.1 LOF Spill Indicators - By Size



	SALE 1	SALE 2	SALE 3	SALE All	SALE All non Arctic
Huge Spills =>10000 bbl	3.369	3.323	3.901	9.019	12.956
Large Spills 1000-9999 bbl	4.099	3.989	4.575	10.882	15.653
Small and Medium Spills 50-999 bbl	9.404	9.586	11.320	26.180	38.900

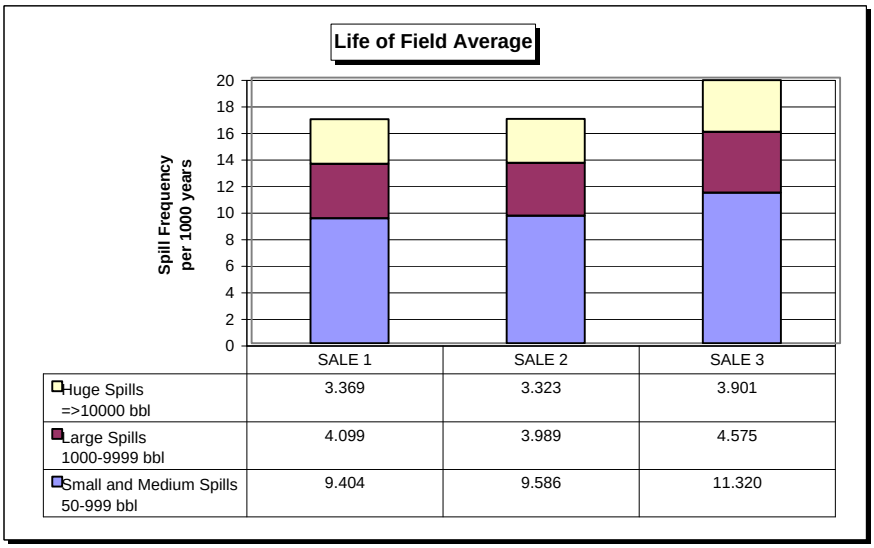


	SALE 1	SALE 2	SALE 3	SALE All	SALE All non Arctic
Huge Spills =>10000 bbl	0.219	0.234	0.246	0.229	0.330
Large Spills 1000-9999 bbl	0.267	0.281	0.289	0.277	0.398
Small and Medium Spills 50-999 bbl	0.612	0.674	0.714	0.666	0.990

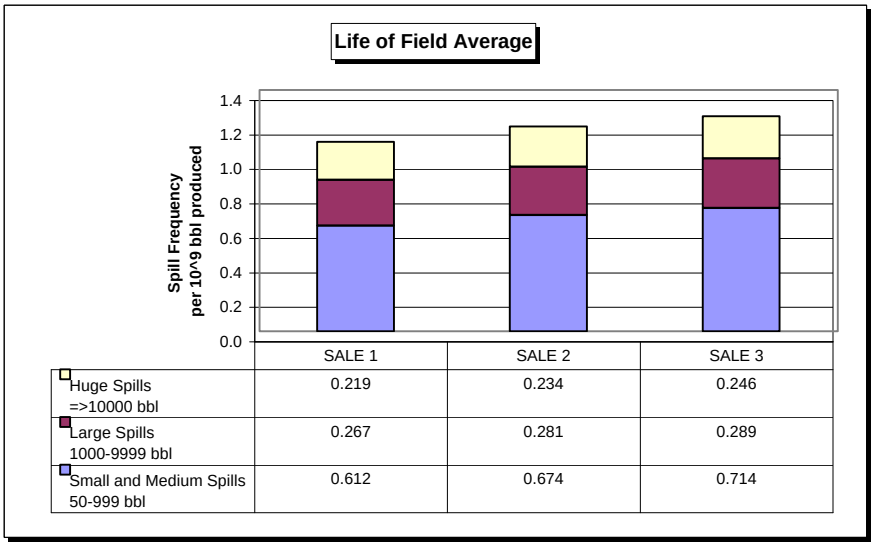


	SALE 1	SALE 2	SALE 3	SALE All	SALE All non Arctic
Huge Spills =>10000 bbl	270	268	317	721	1048
Large Spills 1000-9999 bbl	31	30	35	81	117
Small and Medium Spills 50-999 bbl	4	4	5	11	15

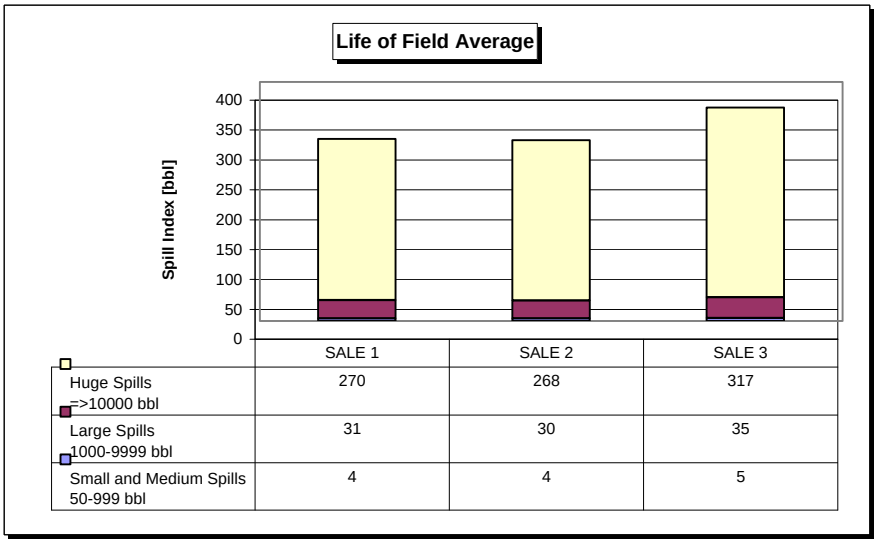
Figure 5.2 LOF Spill Indicators - By Size



	SALE 1	SALE 2	SALE 3
Huge Spills =>10000 bbl	3.369	3.323	3.901
Large Spills 1000-9999 bbl	4.099	3.989	4.575
Small and Medium Spills 50-999 bbl	9.404	9.586	11.320

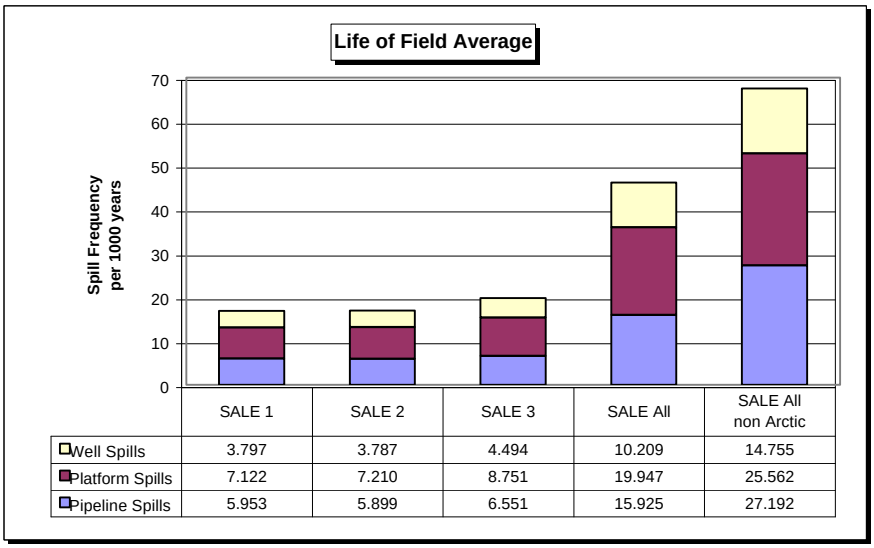


	SALE 1	SALE 2	SALE 3
Huge Spills =>10000 bbl	0.219	0.234	0.246
Large Spills 1000-9999 bbl	0.267	0.281	0.289
Small and Medium Spills 50-999 bbl	0.612	0.674	0.714

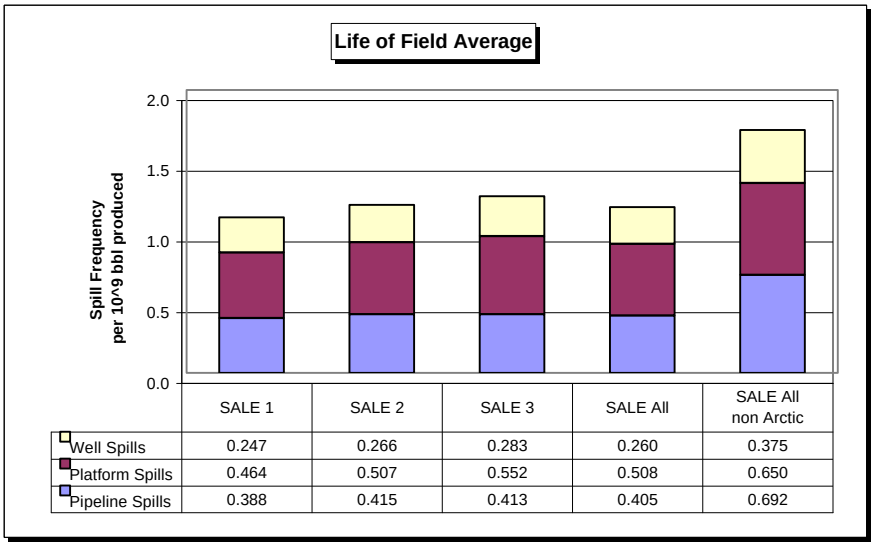


	SALE 1	SALE 2	SALE 3
Huge Spills =>10000 bbl	270	268	317
Large Spills 1000-9999 bbl	31	30	35
Small and Medium Spills 50-999 bbl	4	4	5

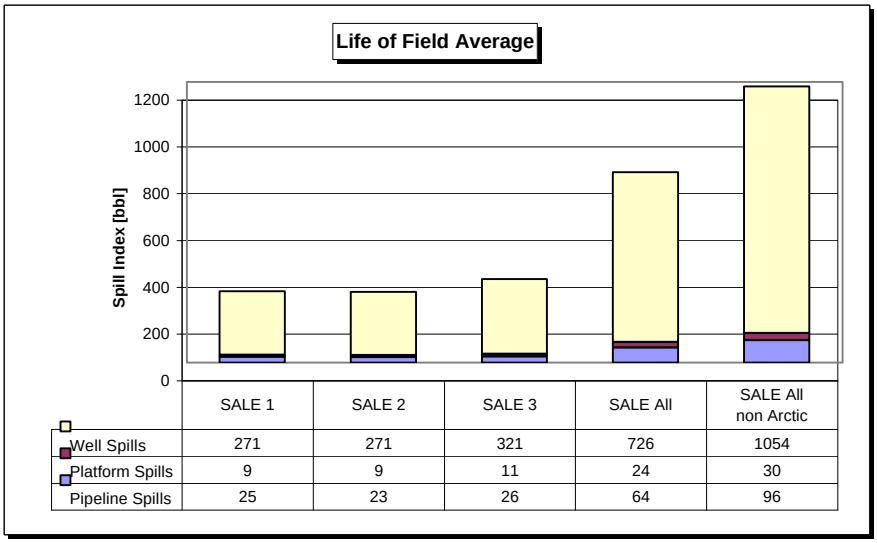
Figure 5.2 LOF Spill Indicators - By Source



	SALE 1	SALE 2	SALE 3	SALE All	SALE All non Arctic
Well Spills	3.797	3.787	4.494	10.209	14.755
Platform Spills	7.122	7.210	8.751	19.947	25.562
Pipeline Spills	5.953	5.899	6.551	15.925	27.192

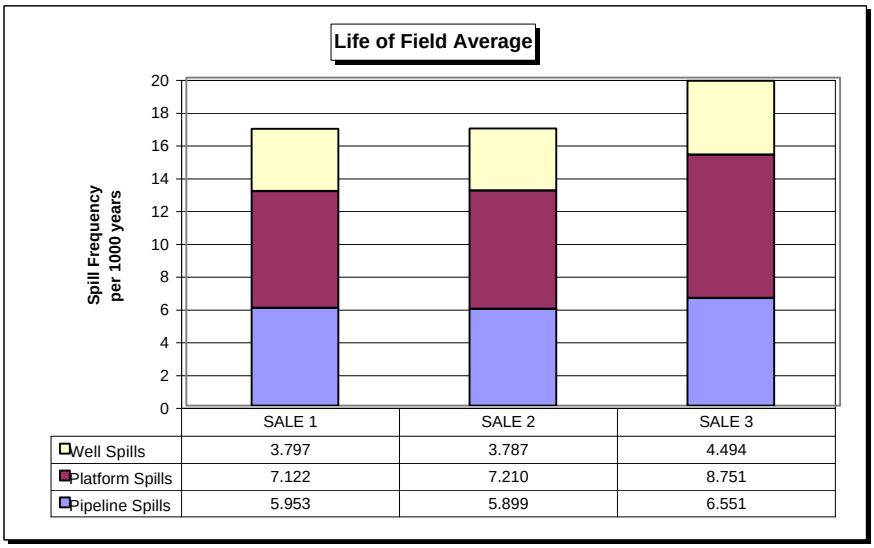


	SALE 1	SALE 2	SALE 3	SALE All	SALE All non Arctic
Well Spills	0.247	0.266	0.283	0.260	0.375
Platform Spills	0.464	0.507	0.552	0.508	0.650
Pipeline Spills	0.388	0.415	0.413	0.405	0.692

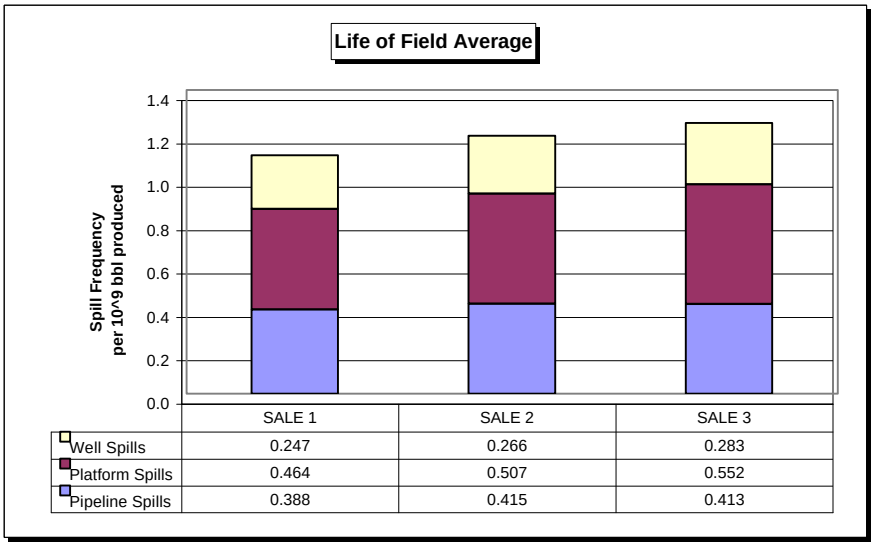


	SALE 1	SALE 2	SALE 3	SALE All	SALE All non Arctic
Well Spills	271	271	321	726	1054
Platform Spills	9	9	11	24	30
Pipeline Spills	25	23	26	64	96

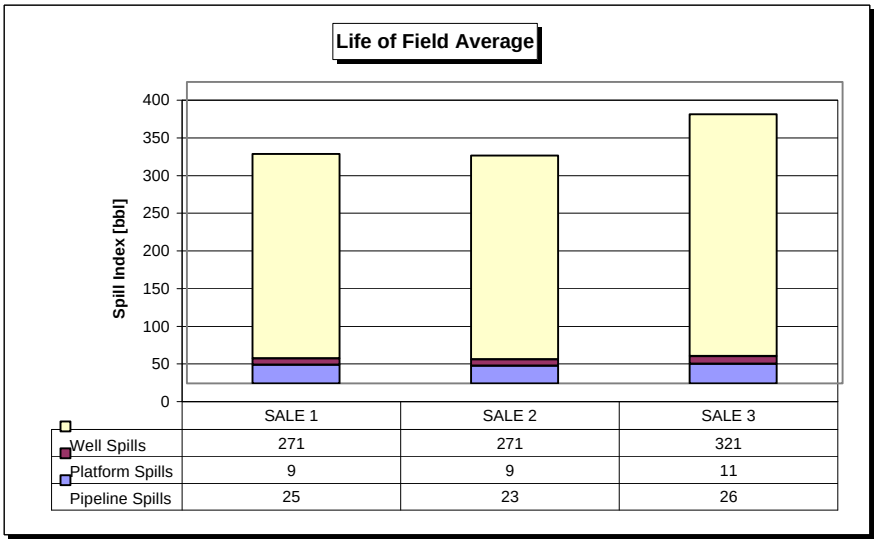
Figure 5.4 LOF Spill Indicators - By Source



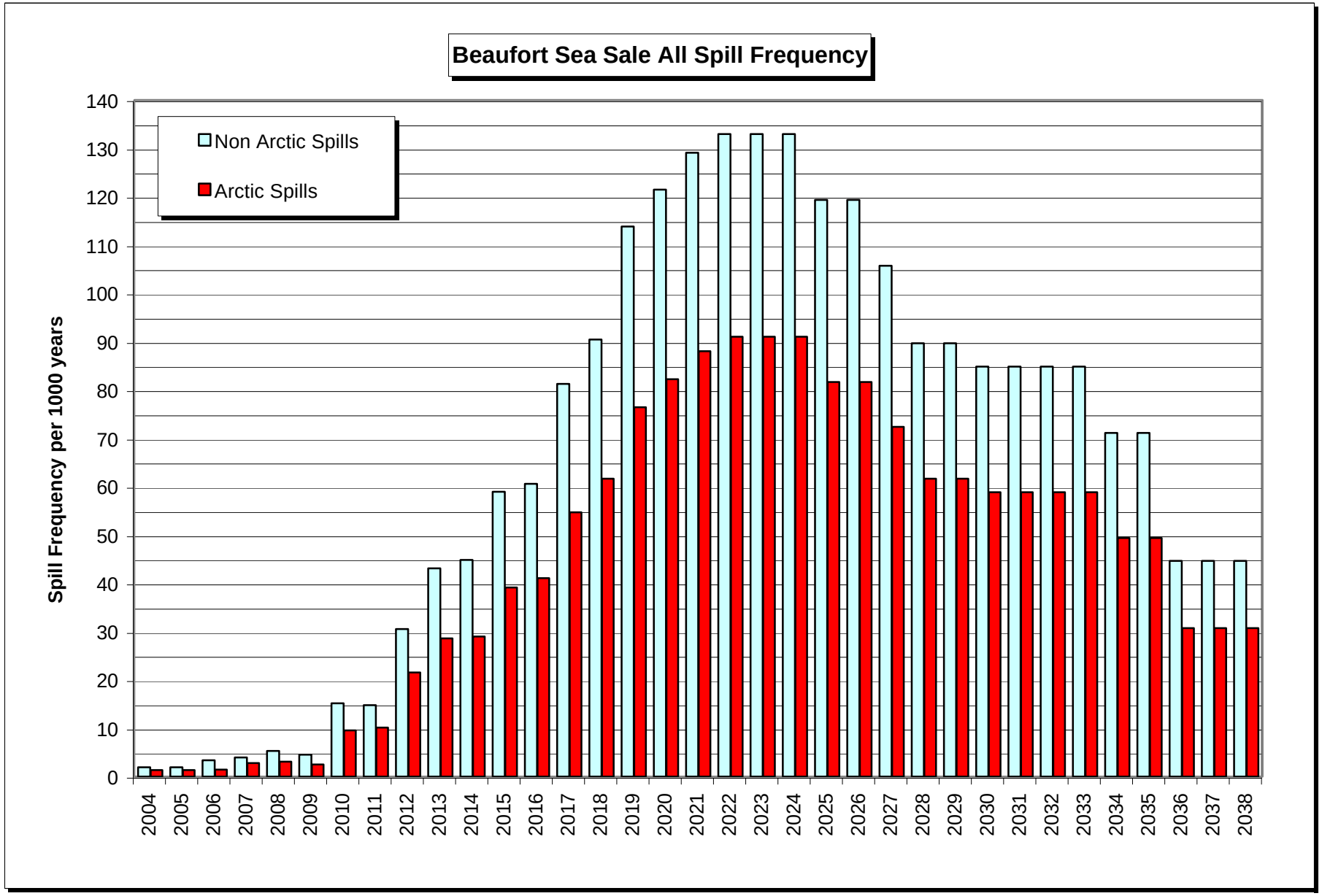
	SALE 1	SALE 2	SALE 3
Well Spills	3.797	3.787	4.494
Platform Spills	7.122	7.210	8.751
Pipeline Spills	5.953	5.899	6.551



	SALE 1	SALE 2	SALE 3
Well Spills	0.247	0.266	0.283
Platform Spills	0.464	0.507	0.552
Pipeline Spills	0.388	0.415	0.413



	SALE 1	SALE 2	SALE 3
Well Spills	271	271	321
Platform Spills	9	9	11
Pipeline Spills	25	23	26


Beaufort Sea Sale All Spill Frequency
Non Arctic Spills
Arctic Spills
Spill Frequency per 1000 years
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
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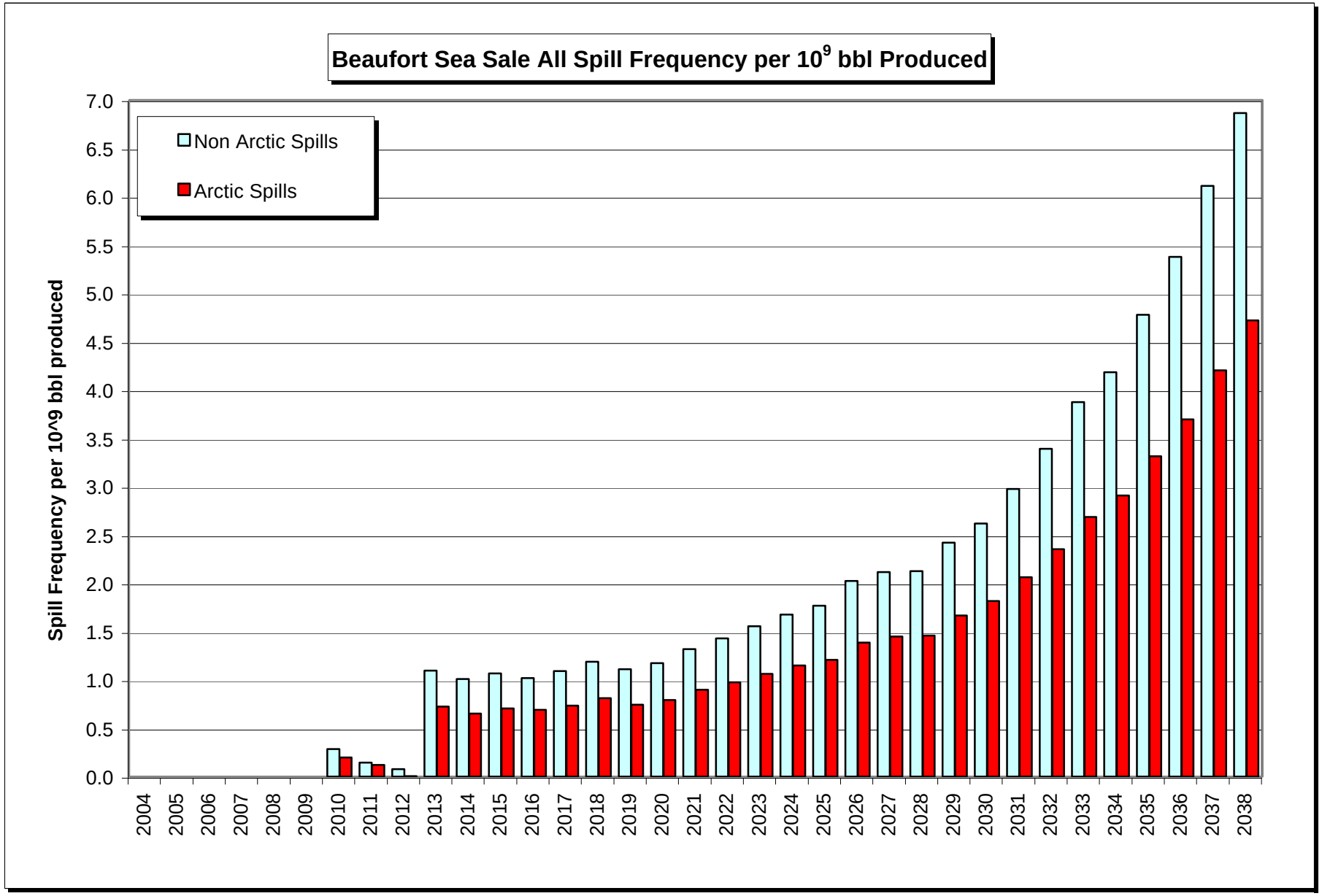
2037
2038


Beaufort Sea Sale All Spill Frequency per 10^9 bbl Produced
Non Arctic Spills
Arctic Spills
Spill Frequency per 10^9 bbl produced
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
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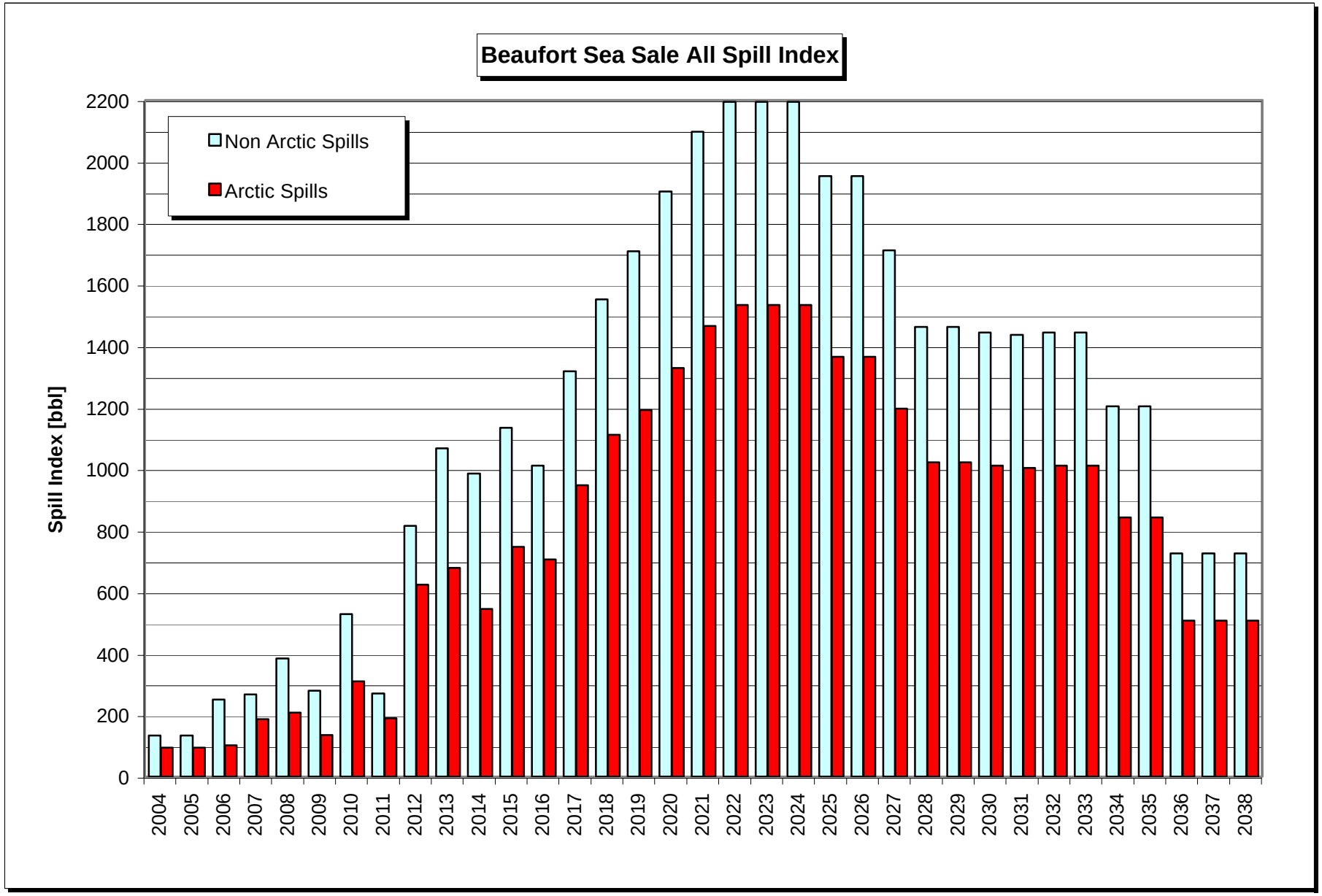
Beaufort Sea Sale All Spill Index
Non Arctic Spills
Arctic Spills
Spill Index [bbl]
0
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
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The Department of the Interior Mission

As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering sound use of our land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our national parks and historical places; and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people by encouraging stewardship and citizen participation in their care. The Department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

The Minerals Management Service Mission

As a bureau of the Department of the Interior, the Minerals Management Service's (MMS) primary responsibilities are to manage the mineral resources located on the Nation's Outer Continental Shelf (OCS), collect revenue from the Federal OCS and onshore Federal and Indian lands, and distribute those revenues.

Moreover, in working to meet its responsibilities, the **Offshore Minerals Management Program** administers the OCS competitive leasing program and oversees the safe and environmentally sound exploration and production of our Nation's offshore natural gas, oil and other mineral resources. The MMS **Royalty Management Program** meets its responsibilities by ensuring the efficient, timely and accurate collection and disbursement of revenue from mineral leasing and production due to Indian tribes and allottees, States and the U.S. Treasury.

The MMS strives to fulfill its responsibilities through the general guiding principles of: (1) being responsive to the public's concerns and interests by maintaining a dialogue with all potentially affected parties and (2) carrying out its programs with an emphasis on working to enhance the quality of life for all Americans by lending MMS assistance and expertise to economic development and environmental protection.