## LIST OF PMSC RISK ASSESSMENTS

Risk Assessment	Risk Assessment	
Number	Name	Reviewed
POTLL PMSC RA 01-03	POTLL - Non Tidal Arrival and Sailing	22/04/2024
POTLL PMSC RA 02-03	POTLL - Tidal arriving and Sailing	22/04/2024
POTLL PMSC RA 03-03	POT11L - Tidal Arriving and Sailing	22/04/2024
POTLL PMSC RA 04-03	POTLL- Non tidal Bunkering Operations	22/04/2024
POTLL PMSC RA 05-03	POTLL - Tidal Bunkering Operations	22/04/2024
POTLL PMSC RA 06-03	POT11L - Tidal Bunkering operation	22/04/2024
POTLL PMSC RA 07-03	POTLL - Non tidal Marine Pollution	22/04/2024
POTLL PMSC RA 08-03	POTLL and POT11L - Tidal Marine pollution	22/04/2024
POTLL PMSC RA 09-03	POTLL Non tidal Diving Operation	22/04/2024
POTLL PMSC RA 10-03	POTLL and POT11 - Tidal Diving Operations	22/04/2024
POTLL PMSC RA 11-03	POTLL - Non tidal towage operations	22/04/2024
POTLL PMSC RA 12-03	POTLL - Tidal Towage Operations	22/04/2024
POTLL PMSC RA 13-03	POT11L - tidal Towage operations	22/04/2024

## PMSC RISK ASSESSMENT - RISK RANKING

Rank	HazardID	Hazard What can go wrong (Event leading to a consequence)	Hazard Scoring
1	POTLL PMSC RA 03-03 1.2 Contact	Contact	7.375
2	POTLL PMSC RA 02-03 1.2 Contact	Contact	6.75
3	POTLL PMSC RA 01-03 1.2 Contact	Contact	6.625
4	POTLL PMSC RA 11-03 1.1 Capsiz/Flooding	Capsize/Flooding	6.5
5	POTLL PMSC RA 01-03 1.1 Collision/Allision	Collision/ allision	6.375
5	POTLL PMSC RA 01-03 1.5 Fire/Explosion	Fire/Explosion	6.375
7	POTLL PMSC RA 11-03 1.3 Contact	Contact	6
8	POTLL PMSC RA 05-03 1.4 Fire/Explosion	Fire/Explosion	5.625
8	POTLL PMSC RA 06-03 1.4 Fire Explosion	Fire/Explosion	5.625
8	POTLL PMSC RA 11-03 1.2 Fire	Fire	5.625
11	POTLL PMSC RA 01-03 1.6 loss of containment (oil products)	Loss of Containment (Oil Product)	5.5
11	POTLL PMSC RA 02-03 1.3 Grounding	Grounding	5.5
11	POTLL PMSC RA 03-03 1.3 Grounding	Grounding	5.5
11	POTLL PMSC RA 04-03 1.4 Fire/Explosion	Fire/Explosion	5.5
15	POTLL PMSC RA 12-03 1.1 Capsiz/Flooding	Capsize/Flooding	5.375
15	POTLL PMSC RA 12-03 1.2 Fire	Fire	5.375
17	POTLL PMSC RA 12-03 1.3 Contact	Contact	5.25
18	POTLL PMSC RA 05-03 1.2 Contact	Contact	5.125
18	POTLL PMSC RA 06-03 1.2 Contact	Contact	5.125
18	POTLL PMSC RA 12-03 1.4 Collision	Collision	5.125
21	POTLL PMSC RA 01-03 1.4 sinking/capsize	Sinking/Capsize	5
21	POTLL PMSC RA 04-03 1.3 Loss of Containment (Oil Product)	Loss of Containment (Oil Product)	5
23	POTLL PMSC RA 04-03 1.2 Contact	Contact	4.75
24	POTLL PMSC RA 05-03 1.3 Loss of Containment (Oil Product)	Loss of containment (Oil Product)	4.625
24	POTLL PMSC RA 06-03 1.3 Loss of Containment (Oil Product)	Loss of containment (Oil Product)	4.625

POTLL PMSC RA 13-03 1.4 Collision	Collision	4.625
POTLL PMSC RA 01-03 1.3 Grounding	Grounding	4.5
POTLL PMSC RA 03-03 1.6 Loss of Containment (Oil Products)	Loss of Containment (Oil Proiducts)	4.5
POTLL PMSC RA 05-03 1.1 Collision with bunker and receiving vessel	Collision with bunker and reciveing vessel	4.5
POTLL PMSC RA 06-03 1.1 Collision with bunker and receiving vessel	Collision with bunker and receiving vessel	4.5
POTLL PMSC RA 11-03 1.4 Collision	Collision	4.5
POTLL PMSC RA 12-03 1.6 Man overboard/personal injury	Man Overboard/Personal Injury	4.5
POTLL PMSC RA 09-03 1.1 Swamping/ Turbulance/ Interaction	Swamping/Turbulance/Interaction	4.25
POTLL PMSC RA 02-03 1.5 Fire/Explosion	Fire/Explosion	4.125
POTLL PMSC RA 02-03 1.6 Loss of Containment(Oil Products)	Loss of containment (Oil Products)	4.125
POTLL PMSC RA 03-03 1.5 Fire/Explosion	Fire/Explosion	4.125
POTLL PMSC RA 07-03 1.1 Loss of containment (Oil Product)	Loss of containment (Oil product)	4.13
POTLL PMSC RA 02-03 1.1 Collision/Allision	Collision/Allision	4
POTLL PMSC RA 02-03 1.4 Sinking/Capsize	Sinking/Capsize	4
POTLL PMSC RA 03-03 1.1 Collision Allision	Collision/ Allsion	4
POTLL PMSC RA 03-03 1.4 Sinking/Capsize	Sinking/Capsize	4
POTLL PMSC RA 04-03 1.1 Collision with bunker and receiving vessel	Collision with bunker and receiving vessel	3.75
POTLL PMSC RA 11-03 1.6 Man overboard/personal injury	Man overboard/personal injury	3.75
<sup>42</sup> POTLL PMSC RA 12-03 1.5 Grounding	Grounding	3.75
45 POTLL PMSC RA 10-03 1.2 Contact/Collision	Contact/Collision	3.625
46 POTLL PMSC RA 13-03 1.1 Capsize/Flooding	Capsize/ Flooding	3.5
46 POTLL PMSC RA 13-03 1.2 Fire	Fire	3.5
46 POTLL PMSC RA 13-03 1.5 Grounding	Grounding	3.5
49 POTLL PMSC RA 10-03 1.1 Swamping/Turbulance/Interaction	Swamping/Turbulance/Interaction	3.375
<sup>49</sup> POTLL PMSC RA 13-03 1.3 Contact	Contact	3.375
51 POTLL PMSC RA 09-03 1.2 Contact/Collision	Contact/Collision	3.25
52 POTLL PMSC RA 11-03 1.5 Grounding	Grounding	2.5
52 POTLL PMSC RA 13-03 1.6 Man overboard	Man overboard	2.5

Rank	Risk Assessment No.	Risk Assessment Name	Average Score
1	POTLL PMSC RA 01-01	POTLL - Non Tidal Arrival and Sailing	5.729
2	POTLL PMSC RA 05-01	POTLL - Tidal Bunkering Operations	4.969
2	POTLL PMSC RA 06-01	POT11L - Tidal Bunkering operation	4.969
4	POTLL PMSC RA 03-01	POT11L - Tidal Arriving and Sailing	4.917
5	POTLL PMSC RA 12-01	POTLL - Tidal Towage Operations	4.896
6	POTLL PMSC RA 11-01	POTLL - Non tidal towage operations	4.813
7	POTLL PMSC RA 02-01	POTLL - Tidal arriving and Sailing	4.750
7	POTLL PMSC RA 04-01	POTLL- Non tidal Bunkering Operations	4.750
9	POTLL PMSC RA 07-01	POTLL - Non tidal Marine Pollution	4.125
10	POTLL PMSC RA 09-01	POTLL Non tidal Diving Operation	3.750
11	POTLL PMSC RA 13-01	POT11L - tidal Towage operations	3.583
12	POTLL PMSC RA 10-01	POTLL and POT11 - Tidal Diving Operations	3.500

## **Risk Assessment Scoring Matrix**

## LIKELIHOOD

- 1 = Extremely unlikely (More than 100 years)
- 2 = Remote (10 99 years)
- 3 = Reasonably likely (1 9 years)
- 4 = Likely (Once per Year)
- 5 = Frequent (More than once per year)

## CONSEQUENCE

## PEOPLE:

- 1 = None
- 2 = Minor, single slight Injury
- 3 = Slight, multiple moderate or single major injury
- 4 = Serious, multiple major injuries or single fatality
- 5 = Major, more than 1 fatality

### **ENVIRONMENT:**

- 1 = Negligable, No Action required 2 = Minor spill Tier 1 local response,
- 3 = Moderate spill, Tier 2 some outside assistance
- 4 = Moderate spill, Tier 2 greater outside assistance
- 5 = Major spill, Tier 3 national response

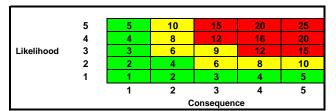
## PROPERTY:

- 1 = negligible < £5000
- 2 = Minor > £5000
- 3 = Moderate >£50,000
- 4 = Serious, > £500,000 5 = major, > £2,000,000

### **BUSINESS:**

- 1 = Negligible impact < £5000
- 2 = Minor impact > £5000
- 3 = Moderate impact > £50,000, bad local publicity, short term reduction of activity.
- 4 = Serious Impact, >£500,000, bad widespread publicity, temporary Port Facility shutdown.
- 5 = Major impact, > £2,000,000, Port facility Closes for more than 1-2 days.

## OVERALL RISK



### **Red indicates last Reviewed**

AMBER Hazards with risk factors within these bands (6 - 10) are termed "consider". These lower risk factors are considered acceptable, but still need careful monitoring to ensure that everything has been done to reduce the consequences and likelihood.

GREEN The lower numbers (5 and below) in the matrix are considered "low-risk", but should still be monitored to ensure that controls remain effective.

## **POTLL Controls - In Dock and River Berths**

Marine Department Scheduling

Marine Department Mooring Reviews

Bunker Checklist/Procedures

Marine Department Dock Patrols

**POTLL UKC** 

**POTLL NtMs and PNtMs** 

**POTLL Emergency Procedures** 

**POTLL Port Information and Marine Guidelines** 

**POTLL** Weather forecasting

**POTLL Wind Parameters** 

**POTLL Fog Procedures** 

**POTLL Surveys** 

POTLL Dredging program

**Dock Byelaws** 

**POTLL Mooring Manual** 

**POTLL Permit to Manouevre** 

**POTLL OPRC** 

**POTLL Tier 2 Responders** 

Lock Gates

**POTEMPLA** 

**POTLL Ruling Depths** 

POTLL CCTV

**POTLL Ebb Tide Procedure** 

**POT11L Byelaws** 

POT11L and PLA MOU

POTLL Tier 2 responder

**Bridge simulation Reports** 

T2 Nav Risk Assessment

## PLA Controls - River Berths and Tidal lock Arr/Dep

**PLA Pilotage Directions** 

**PLA VTS Service** 

**PLA Hydrographic Surveys** 

**PLA Tidal Information** 

PLA Ship Towage Code of Practice

PLA Craft Towage Code of Practice

**PLA Byelaws and General Directions** 

**PLA NtMs** 

**PLA Tosca** 

## **External Controls**

Ship towage



			INSERT TITLE										
Ref.	Hazard What can go wrong	Controls  Preventative & Reactive	Ris		level	t Resi l kely)	idual			level	t Resi I edible		
	(Event leading to a consequence)		(What action & how frequent)		(	Overa	all Ris	sk			Overa	all Ris	k
				Likelihood	People	Property	Environment	Business	Likelihood	People	Property	Environment	Business
1.1													
1.2													
1.3													
1.4													
1.5													
			Risk Ranking										

		Port of	Tilbury - Non Tidal Arrival and Sailing												
Ref.	Hazard  What can go wrong (Event leading to a consequence)	Causes  How can it go wrong	Controls  Preventative & Reactive (What action & how frequent)	Ris	Risk scored at Residual level (Most Likely)  Overall Risk			le /orst	d at Revel Credib		al .	Risk Score			
				Likelihood	People	Property	Environment	Business	Likelihood	People	Environment	Business		Hazard F	Most Likely/Worst Credible Scenarios
1.1	Cellsion	Technical Failure Bridge Team Error Environmental Conditions	POTIL Permit to Manosuve POTIL Bermin Advisors POTIL Marine Department scheduling POTIL Permin Advisors POTIL Marine Department scheduling POTIL PINTS and NTMS POTIL Ruling Depths POTIL Mearine Guidelines and Port Information POTIL Weather forecasting POTIL Weather forecasting POTIL Wind Parameters POTIL Marine Emergency plans POTIL CCTV POTEMELA POTIL OPRC POTIL Tier 2 Responders	3	3	6	3	3	2	10 1	0 6	10		6.375	Most Likely - Contact between 2 vessels manouvring in dock. No injuries, light/superficial damage to one or both vessels. No interuption to posted.  Worst Credible - Collision between vessel departing in dock berth and a vessel departing lock and manouvring for dock berth. resulting in labelities, loss of vessel and oil spill
1.5	Contact	Technical Failure Bridge Team Error Environmental Conditions Quayaide Obstruction	POTIL Permit to Manouevre POTIL Berthing Advisor scheduling POTIL Berthing Advisor scheduling POTIL PNTMS and NTMS POTIL PNTMS and NTMS POTIL Ruling depths POTIL Meant Guidelines and Port Information POTIL Weather forecasting POTIL Weather forecasting POTIL Unity Parameters POTIL Parameters POTIL COTV POTIL OF POTIL POTIC PROPER POTIL COTV POTIL OF POTIL PROPER POTIL THE Z Responders PLA Ship towage Code of Practice Ship Towage	5	5	10	5	5	2	2 1	0 6	10		6.625	Most Likely - Light contact with quayside during approach/departure from berth, superficial damage is sculling to painwork and concrete, no damage and no interception to port trade  Worst Credible - Contact with the inner lock gates during departure from dock rendering the lock gates UIS resulting in loss of trade and revenue for the dock. No liquides
1.0	Grounding	Collision Contact Grounding Technical Failure Human Error Environmental Conditions	POTIL Surveys POTIL Surveys POTIL Permit to Manoeuvre POTIL Permit to Manoeuvre POTIL Ruling Depths POTIL Marine Department scheduling POTIL HYTMS and NMMS POTIL Marine Guidelines and Port information POTIL weather forecasting POTIL House Potic Potic Marine Potic Marine POTIL HOUSE POTISMEN POTIC MARINE POTIC MARINE POTIC MARINE POTISMEN POTIC MARINE POTIC MARINE POTIC MARINE PLA Ship towage Code of Practice Ship Towage	5	-50	5	5	5	2	2	4 2	8		4.5	Most Likely: Vessel touches bottom while manuouring for berth, vessel does not take bottom, engines push through the mud and vessel continues to destination with no interuption.  Worst Credible: Vessel takes to ground en route to berth, cannot refloat and requires increase in dock level and tug assistance. Potential interuption to port trade.
1.4	Sinking / Capsize	Collision Contact Grounding Technical Failure Failure of Vessel Stability Human Error Environmental Conditions	POTIL Marine Department Scheduling POTIL Berting Advisors POTILL weather forecasting POTIL Weather forecasting POTIL Wind parameters POTIL Parameters POTIL Parameters POTIL Poting and MMS POTIL Marine Guidelines and Port information POTIL more ground procedures POTIL Marine emergency procedures POTIL Surveys POTIL UKC POTIL Surveys POTIL VKC POTIL Parameters PO	2	2	4	2	2	3	3	9	9			Most Likely: Small beatmens vessel swamped by wash or environemntal conditions leading to loss of stability and capsize. No injuries, vess remains buoyant and is lifted onto queyaids, sheen on the water due to fluid excepting from breathers,  Worst Credible: Machinery deficiency cause vessel to take on water, bilge pumps overwhelmed by volume and vessel continues to take on water. Vessel stranded in dock, requiring tug assistance to move.
1.5	Fire / Explosion	Collision Contact Grounding Human Error Technical Frailure Loss of Containment	POTILL Permit to Manoeuvre POTILL Berthing Advisors POTIL Marine Department Scheduling POTIL Marine Department Scheduling POTILL Wind Parameters POTIL Parameters POTIL Permit Parameters POTILL Profit Parameters POTIL Potil Parameters POTIL Lemergency procedures POTIL Hower Department POTIL Department POTIL Po	3	3	6	3	3	2	10	В 10	8		6.375	Most Likely: Fire on vessel whilst loading scrap metal, fire contained and extinguished using on board FFE. No injuries, very minor damage  Worst Credible-Fire on a vessel loading scrap including to lithium ion batteries, external assistance required and delays to shapping caused.   causing multiple major injuries or a single fatality
1.4	Loss of Containment (Oil Products)	Collision Grounding Human Error Contact Technical Failure Sinking / Capsizing Fire / Explosion Environmental Conditions	Marine Department scheduling POTILL Berthing Advisors POTILL Burkining procedure and checklist POTILL Surveys POTILL Daving program POTILL Marine Guidelines and Port information POTILL Dredging program POTILL Ther 2 responders POTILL Ther 2 responders POTILL Lock Gates POTILL Lock Gates POTILM POTIL POTIC PROFILE POTILL PROFILE POTILL THE POTILL THE POTILL THE POTILL THE POTILL THE POTILL THE PROFILE POTILL THE PROFILE	4	4	4	4	4	2	4	3 8	10	,	5.5	Most Likely: Loss of small amount of fuel during on board bunkering operations. Split fuel contained on deck.  Worst Credible: Collision holes fuel tank resulting in large quality of heavy fuel oil discharged into the dock. Tier 2 response and interuption to Port busiess.

Ref.	Hazard  What can go wrong (Event leading to a consequence)	Causes  How can it go wrong	Controls  Preventative & Reactive (What action & how frequent)	Ris	k scored lev (Most	vel	ly)	ual		Risk scored at Residual level (Worst Credible)		Risk Score		
				Likelihood	People	Fraironment	Environment	Business	Likelihood	People	Property	Business	Hazard Ri	Most Likely/Worst Credible Scenarios
1.1	Collision	Technical Failure Bridge Team Error Environmental Conditions	POTIL Marine Department scheduling POTILL PNTMs and NTMs POTILL Marine Guidelines and Port Information POTIL Warine Guidelines and Port Information POTIL waterine roreasting POTILL Marine emergency plans PLA Pilotage Directions PLA PIS service PLA Pilotage Directions PLA OTS service PLA Ntds PLA Deviated User Guide PLA Ntds PLA Ship towage Code of Practice Ship Towage Bridge Simulation	3	3 є	5 :	3	3	1	5	4	4 4	4	Most Likely - Collision between LCT vessel manouvring toffrom berth at slow speed and a recreational vessel from West Thurrock Yacht Club  Worst Credible - Collision between LCT vessel manouvring off berth and a specified tanker bound for the Navigator terminal resulting in serious dis
1.2	Contact	Technical Failure Enderge Team Error Endergement Conditions Failure of Aids to Navigation Quayaids Obstruction	POTIL Marine Department scheduling POTIL Marine Outpartment scheduling POTIL Marine Guidelines and Port Information POTIL Marine Guidelines and Port Information POTIL weather forecasting POTIL weather forecasting POTI POTIC POTI	4	4 8	3	4	4	2	10	8	6 10	6.75	Most Likely - Low speed low energy contact between LCT feeder vessel and quayside resulting in soutling scraping of the concreete. No injuries, n disruption to Port.  Worst Credible - Contact with LCT gantry crane during annual/departure resulting in loss of crane, loss of life and substantial dmagae to vessel and berth.
1.3	Grounding	Technical Failure Bridge Team Error Environmental Conditions Surveying Omission Failure of Aids to Navigation	POTLL Conservency program POTLL Ruling Depths POTLL Marine Department scheduling POTLL Marine Department scheduling POTLL Marine Guidelines and Port information POTLL Marine Guidelines and Port information POTLL Marine Guidelines and Port information POTLL Marine POTLL MARINE PLA WISS Service PLA Pilotage Directions PLA Miss Service PLA Splicage Directions PLA Ship Towage Code of Practice Ship Towage Bridge Simulation	3	3 ε	5 :	3	6	2	4	8	6 8	5.5	Most likely - Grounding on soft must white departing Tilbury Grain Inner terminal on the flood tide, refloated on the rising tide. No damage to vesse injury and no interuption to port trade  Worst Credible - Grounding during ArrivalDeparture from LCT on falling side, vessel cannot refloat, berths blocked for at least one tide. Substantial damage to grounded vessel, no injuries.
1.4 \$	Sinking Capsize	Collision Contact Grounding Technical Failure Failure of Vessel Stability Human Error Environmental Conditions	POTLL Marine Department Scheduling POTLL Weather forecasting POTLL PNIMS and NIMS POTLL Marine Guidelines and Port information POTLL Marine Guidelines and Port information POTLL moring manual POTLL emergency procedures PLA TS service PLA Pilotage directions PLA Sit prowage code of practice Ship Towage Bridge Simulation	2	2 6	5 4	4	2	1	5	5	4 4	4	Small craft swamped during mooring activities resulting in sinking of craft  Loss of stability during cargo operations resulting in sinking, potential for serious injuryloss of life loss of operational berth, pollution, closure of Tilb  Dook
1.5	Fire/Explosion	Collision Contact Grounding Human Error Technical Failure Loss of Containment	POTIL Marine Department Scheduling POTIL Weather forecasting POTIL PNMs and NMs POTIL L Marine Guidelines and Port information POTIL Marine Guidelines and Port information POTIL mooring manual POTIL emergency procedures PLA YTS service PLA Pilotage directions PLA ship towage code of practice PLA ship towage code of practice PLA NMS PLA Byelaws and General Directions Ship Towage Bridge Simulation	3	3 €	5 :	3	3	1	5	5	4 4	4.125	Most Likely: small fire on board due to hot works, extinguised by crew. Minor dinagae to vessel paint work, no injuries, no disruption to the Port.  Worst Credible: Engine room fire caused my machinery malfunction, beyond crews capability to extinguish on vessel containing class 1 or 7 haza cargo. Multiplie injuries to crew, substantial damage to vessel and disruption to the Port.
1.6	Loss of containment (Oil products)	Collision Grounding Human Error Contact Technical Failure Sinking / Capsizing Fire / Explosion Error femoral Conditions	Marine Department scheduling POTIL Bunkering procedure and checklist POTIL Surveys POTIL dredging program POTIL dredging program POTIL Marine Guidelines and Port information POTIL Emergency plans POTIL DREDGE POTIL Text	4	4 4	4	4	4	1	5	5	5 5	4.125	Most Likely: Loss of small amount of fuel during pn board bunkering operations, le mobile generator. Split fuest contained on deck.  Worst Credible: Collision holes fuel tank resulting in large quality of heavy fuel oil discharged into the Thames. Tier 2 response and interuption to fusioness.



_	<u> </u>		Nisk Assessment												
		Port of Tilbur	y 2 - Arrival and Sailing PLA waters to Be												1
Ref.	Hazard  What can go wrong (Event leading to a consequence)	Causes How can it go wrong	Controls  Preventative & Reactive (What action & how frequent)	Ris	Risk scored at Residual level (Most Likely)  Overall Risk			(Wor	level st Cre	t Resi	)	k Score			
				Likelihood	People	Property	Environment	Business	Likelihood	People	Property	Environment	Business	Hazard Risk	Most Likely/Worst Credible Scenarios
1.1	Collision	Technical Falure Bridge Team Eror Eror Eror Eror Eror Eror Eroviconmental Conditions	POTLE Permit to Manceuver POTLE Berting Advisors POTLL Berting Advisors Potle	3	3	6	3	3	1	5	4	4	4	,	Most Likely - Collision between vessel manouring to from berth at slow speed and a boatmens vessel Most Circlision between vessel manouring of berth and a specified tarker bound for the Novigitars terminal resulting in serious damage to one or both vessels allowe and below the water
1.2	Contact	Technical Failure Bridge Team Eror Environmental Conditions Quayside Obstruction	FOTLE Permit to Manoueve POTLE Berthing Advisors POTLE Marine Department scheduling POTLE Marine Department scheduling POTLE RVINE and NYME POTLE RVINE Advisors POTLE Marine Collections and Port Information POTLE Marine Collections and Port Information POTLE Marine Collection and Port Information POTLE Marine Collection Potle Marine emergency plans POTLE COTT POTEMPA POTLEMPA POTEMPA POTLEMPA POT	5	5	10	5	5	2	10	8	6	10	7.375	Most Likely - Low speed low energy contact between vessell and quayside resulting in scuffing scraping of the concrete. No injuries, no disruption to Port.  Worst Cardible - Contact with shoresis infrastrictures during annual disgranure resulting in loss oferhastructure, loss of life and substantial draugue to vessell and borth.
1.3	Grounding	Collision Contact Grounding Technical Failure Human Error Environmental Conditions	FOTLS surveys  POTL Design program  POTL Permit to Manoeuve  POTL Revin Design program  POTL Revin Design program  POTL Revin Design program  POTL Revin Design program  POTL Marine Culderines and Port information  POTL weather forecasting  POTL LIK CO  POTL Marine Culderines and Port information  POTL LIK CO  POTL Marine Culderines and Port information  POTL LIK CO  POTL Marine Culderines and Port information  POTL LIK CO  Ship Towage ode of Practice  Ship Towage	3	3	6	3	6	2	4	80	6	88	55	Most Bayl - Grounding on soft must white departing Tibury Grain hines terminal on the fixed ide, reflectated on the reliang tide. No damage is vessel, no hiply set on interruption to profit tide.  Note: The reliand tide of th
1.4	Sinking / Capsize	Collision Contact Cont	POTLL Marine Department Scheduling POTL Berthing Anksors POTL weather Unrecessing POTL Restrict Processing POTL Restrict Proceeding POTL Restricted visibility procedures POTL Poths and Nish POTL Marine Guidelines and Port information POTL Marine Guidelines and Pott information POTL Marines Guidelin	2	2	6	4	2	1	5	5	4	4	4	Small craft swamped during moving activities resulting in shiring of craft  Leas of stability during cargo operations resulting in shiring, potential for serious injuryloss of tile loss of operational berth, pollution, closure of the berth
1.5	Sinking / Capsize	Collision Contact Contact Technical Failure Failure of Vessel Stability Failure of Vessel Stability Human Error Environmental Conditions	Marine Department scheduling POTLL Bunkering procedure and checklist POTLL developing procedure and checklist POTLL developing program POTL Marine Guidelines and Port information POTL Developing POTL Emergency plans POTL DPCL Emergency plans POTL DPCL POTL Reining Depth document POTL Reining Depth document POTL Reining Depth document POTL Reining Depth document PA Total PA Total Service PA A Pilot Viseogram PA A Reining Code of practice PA Reining Code of Partice PA Reining Code	3	3	6	3	3	1	5	5	4	4	4.125	Most Usely small fee on based due to Not earlie, edifiguised by crew Minor drangue to vessel paint work, no injuries, no disruption to the Port.  Notice Condition. Engine room fee custed any machinery maltitudine, beyond crews capability to entiripation or essel containing class is or if hazardous cargo. Multiple injuries to crew, autotantial damage to vessel and disruption to the Port.
1.4	Loss of containment (Oil products)	Collision Crowding Chowding Human Error Contact Technical Falure Sinking! Capazing Fire! Explosion Environmental Conditions	James Department scheduling POTLL Bushering procedure and checklist POTL Sunweys POTL Sunweys POTL design program POTL Marine Guidelines and Port information POTL Marine Guidelines and Port information POTL Department POTL Total POTL Emergency plans POTL Total POTL Title 2 respect document POTL Total PA TOTS service PLA NTS service PLA NTS service PLA Ntp Lower Code of practice PLA Big Lowage code of practice PLA Big Lowage code of practice PLA Big Lowage code of practice PLA Spidwax and General Directions Ship Towage Bidge Simulation TZ Navigational Raik Assessment	4	4	4	4	4	1	5	5	5	5	4.5	Most Likely Loss of small amount of fuel during po board burshering operations, is mobile generator. Spill fueld contained on deck.  Worst Credible: Collision holes fuel bank resulting in large quality of heavy fuel oil discharged into the Thames. The 2 response and interception to Port business.

	Port of Tilbury - Non Tidal Bunkering Operations													
Ref.	Hazard  What can go wrong (Event leading to a consequence)	Causes How can it go wrong	Controls  Preventative & Reactive (What action & how frequent)	Ris	Risk scored at Residual Flevel (Most Likely)			le Worst	evel Credit					
				Likelihood		Overa	Environment Environment	Business	Likelihood		roperty Environment		Hazard Risk Score	Most Likely/Worst Credible Scenarios
1.1	Collision with bunker vessel and receiving vessel	Technical Failure Bridge Team Error Environmental Conditions	POTLL Permit to Manouevre Marine Department scheduling POTLL Bunker procedure and checklist POTLL weather parameters POTLL Withs and PNtMs POTLL twiks and PNtMs POTLL tug requirements POTLL Mooring manual POTLL Emergency plans POTLL Emergency exercises POTLL DPRC Plan POTLL Tier 2 responders Lock gates POTLL Serthing Advisors PLA Ship Towage Code of Practice Ship Towage	2	2	2	2	2	2	4	6 6	6	3.75	Most Likely: Low speed collision between bunker vessel and receiving vessel, no damage to either vessel.  Worst credible: Collision caused by equipment failure, with collision resulting in damage and hole below the waterline in recieving vessel.
1.2	Contact	Technical Failure Bridge Team Error Environmental Conditions Mooring Failure	POTLL Permit to Manouevre POTLL Marine Department scheduling POTLL Bunker procedure and checklist POTLL weather parameters POTLL weather forecasting POTLL NtMs and PNtMs POTLL tug requirements POTLL Mooring manual POTLL Emergency plans POTLL Emergency plans POTLL EPRC Plan POTLL Ter 2 responders Lock gates POTLL Berthing Advisors PLA Ship Towage Code of Practice Ship Towage	3	3	3	3	3	2	4	6 8	8	4.75	Most Likely: Contact by passing vessel whislt bunker resulting in no damage and no oil spill  Worst credible: Contact by passing vessel whislt bunker resulting in damage to oil spill bunker hose before fuel shut off leading to in dock pollution and tier 2 response.
1.3.	Loss of Conrainment (Oil Products)	Technical Failure Human Error Collision Grounding Mooring Failure Sinking Fie/Expolsion Contact	POTLL Permit to Manouevre Marine Department scheduling and traffic organisation POTLL Bunker procedure and checklist POTLL weather parameters POTLL Whather forecasting POTLL Nikh and PNtMs POTLL Mooring manual POTLL Emergency plans POTLL Emergency exercises POTLL OPRC Plan POTLL Tier 2 responders Lock gates POTLL Bething Advisors PLA Ship Towage Code of Practice Ship Towage	3	3	3	3	3	2	8	6 8	6	5	Most likely: falled fitting on bunker hose resulting in small loss of profluct on deck, scuppers closed, on deck clean up only, no pollution in dock.  Worst Credible: Due to communication errors hose disconnected imediately before pumping begins. Volume of oil product lost in dock requiring tier 2 response.
1.4	Fire/Explosion	Technical Failure Human Error Collision Grounding Mooring Failure Sinking Fiel/Expolsion Contact	POTLL Permit to Manouevre POTLL Marine Department scheduling POTLL Bunker procedure and checklist POTLL washer parameters POTLL weather parameters POTLL Wording manual POTLL Niths and PNiths POTLL Mooring manual POTLL Emergency plans POTLL Emergency exercises POTLL PRC Plan POTLL Tier 2 responders Lock gates POTLL Berthing Advisors PLA Ship Towage Code of Practice Ship Towage	2	3	3	3	3	2	8	8 8	8	5.5	Most likely: small fire on board. Fire isolated and dealt with by crew. No damage, no injuries.  Worst credible: fire/explosion caused by malfunctioning equipment leading to injuries on crew on board and loss of oil into dock requiring tier 2 response

		Port of Tilbury	Tidal Bunkering Operations (from Road	tank	(er)									_
Ref.	Hazard What can go wrong	What can go wrong How can it go wrong Preventative & Reactive				ored a level		al F		scored lev Worst C	/el		Score	
	(Event leading to a consequence)	gg	(What action & how frequent)			Overa	all Risk			Ove	erall R	isk	isk So	
				Environment	Business	Likelihood	People	Environment	Business	Hazard Risk	Most Likely/Worst Credible Scenarios			
1.1	Collision	Technical Failure Bridge Team Error Environmental Conditions	POTLL Marine Department scheduling POTLL Bunker procedure and checklist POTLL weather parameters POTLL weather forecasting POTLL With and PNIMs POTLL INTMS and PNIMS POTLL Mooring manual POTLL Morine Department Emergency plans POTLL OPRC Plan POTLL Ter 2 responder POTLI L WOU POTILL WOU POTIL byelaws PLA Pilotage Directions PLA VTS service PLA ship towage code of practice Ship Towage Bridge Simulation	3	3	3	3	3	2	4 8	6	6	4.5	Most Likely: Low energy low speed collision between small bunker barge and receiving vessel while manoeuving alongside leading to very minor damage to one or both vessels, no pollution and no injury which is a second or second
1.2	Contact	Technical Failure Bridge Team Error Environmental Conditions Mooring Failure	Marine Department scheduling POTLL Bunker procedure and checklist POTLL weather parameters POTLL weather forecasting POTLL Niths and PNIMS POTLL tug requirements POTLL Mooring manual POTI1L MOU POTI1L Dyelaws POTLL Minine Department Emergency plans	3	3	6	3	3	2	4	6 8	8	5.125	Most Likely: arted mooring line leads to low energy contact with quay during bunkering operations. Bunkers ceased while vessel resecured. No damage.
13	Loss of Conrainment (Oil Products)	Technical Failure	POTLL OPRC Plan POTLL Ter 2 responders PLA Pilotage Directions PLA VTS service PLA ship towage code of practice Ship Towage Bridge Simulation  POTLL Permit to Manouevre											Worst Credible: contact with shoreside infrastructure during bunkering operations due to failed mooring libunker hose disconnected before fuel shut off leading to in dock pollution and tier 2 response.
Tree Tree	Loss of Comaniment (Oil Products)	Human Error Collision Grounding Mooring Failure Sinking Fie/Expolsion Contact	POTLL Pernitt of wandowers POTLL Marine Department scheduling POTLL Bunker procedure and checklist POTLL weather parameters POTLL weather forecasting POTLL NiMs and PNIMs POTLL Moroing manual POTIL MOU POTILL byelaws POTLL Marine Department Emergency plans POTLL OPRC Plan POTLL Ter 2 responders PLA Pilotage Directions PLA VTS service PLA ship towage code of practice Ship Towage Bridge Simulation	3	3	6	3	3	2	4 2	8	8	4.625	Most likely: failed fitting on bunker hose resulting in small loss of prdiuct on deck, scuppers closed, on dec clean up only, no pollution in dock.  Worst Credible: Due to communication errors hose disconnected imediately before pumping begins. Volur oil product lost over the side requiring tier 2 response.
1.4	Fire/Explosion	Technical Failure Human Error Collision Grounding Mooring Failure Sinking Fie/Expolsion Contact	POTLL Marine Department scheduling POTLL Bunker procedure and checklist POTLL weather parameters POTLL weather forecasting POTLL NiMs and PNIMs POTLL Mooring manual POT1LL MOU											Most likely: small fire on board unconnected to bunkering operation. Fire isolated and dealt with by crew. N dmage, no injuries.
			POTLL Marine Department Emergency plans POTLL OPRC Plan POTLL Tier 2 responders PLA Pilotage Directions PLA VTS service PLA ship towage code of practice Ship Towage Bridge Simulation	3	-3	6	3	3	2	6 8	8	8	5.625	Worst credible: fire/explosion caused by malfunctioning equipment leading to injuries on crew on board an of oil into dock requiring tier 2 response

		Port of	f Tilbury 2 - Tidal Bunkering Operations												
Ref.	Hazard  What can go wrong (Event leading to a consequence)	Causes  How can it go wrong	Controls  Preventative & Reactive (What action & how frequent)	Ri	Risk scored at Residual level (Most Likely)  Overall Risk		Ris		level level orst Cre	l edible	<del>:</del> )	k Score			
				Likelihood	People		ŧ	1	Likelihood	People		Environment	Business	Hazard Risk	Most Likely/Worst Credible Scenarios
1.1	Collision with bunker vessel and receiving vessel	Technical Failure Bridge Team Error Environmental Conditions	POTLL Marine Department scheduling POT11L Byelaws POT11L and PLA MOU POTLL Bunker procedure and checklist POTLL weather parameters POTLL weather parameters POTLL with sand PNIMs POTLL tip requirements POTLL Moring manual POTLL Moring manual POTLL Marine Department Emergency plans POTLL UPRC Plan POTLL Tier 2 responder PLA Pilotage Directions PLA VTS service PLA ship towage code of practice Ship Towage Bridge Simulation T2 Navigational Risk Assessment	3	3	: 3	3 3	3	2	4	8	6	6	4.5	Most Likely: Low energy low speed collision between small bunker barge and receiving vessel while manoeuvring alongside leading to very minor damage to one or both vessels, no pollution and no injury  Worst credible: Medium energy medium speed collision between bunker barge and recieving vessel caused by equipment malfunction leading to damage at or above the waterline and holoed fuel tank needing tier 2 response.
1.2	Contact	Technical Failure Bridge Team Error Environmental Conditions Mooring Failure	Marine Department scheduling POT11L Byelaws POT11L Byelaws POT11L and PLA MOU POTLL Bunker procedure and checklist POTLL weather parameters POTLL weather parameters POTLL weather forecasting POTLL NtMs and PNtMs POTLL to grequirements POTLL Mororing manual POTLL Marine Department Emergency plans POTLL OPRC Plan POTLL Tier 2 responders PLA Pilotage Directions	3	3	: 6	6 3	3	2	4	6	8	8	5.125	Most Likely: arted mooring line leads to low energy contact with quay during bunkering operations. Bunkers ceased white vessel resecured. No damage.  Worst Credible: contact with shoreside infrastructure during bunkering operations due to failed mooring lines, bunker hose disconnected before fuel shut off leading to in dock pollution and tier 2 response.
1.3	Loss of Conrainment (Oil Products)	Technical Failure Human Error Collision Grounding Mooring Failure Sinking Fie/Expolsion Contact	PLA VTS service PLA ship towage code of practice Ship Towage Bridge Simulation T2 Navigational Risk Assessment  POTLL Marine Department scheduling POT111. Byelaws POT114. Daylaws POT114. Daylaws POT114. Bunker procedure and checklist POTLL Bunker procedure and checklist POTLL weather forecasting POTLL Nikhs and PNIMs POTLL Moring manual POTLL Moring manual POTLL Marine Department Emergency plans POTLL Tier 2 responders PLA Pilotage Directions PLA VTS service PLA ship towage code of practice Ship Towage Bridge Simulation T2 Navigational Risk Assessment	3	3	6	6 3	3	2	4	2	8	8	4.625	Most likely: failed fitting on bunker hose resulting in small loss of product on deck, scuppers closed, on deck clean up only, no pollution in dock.  Worst Credible: Due to communication errors hose disconnected imediately before pumping begins. Volume of oil product lost over the side requiring ter 2 response.
1.4	Fire/Explosion	Technical Failure Human Error Collision Grounding Mooring Failure Sinking Fie/Expolsion Contact	POTLL Marine Department scheduling POTLL Bunker procedure and checklist POT11L Syelaws POT11L and PLA MOU POTLL Ruiling Depths POTLL weather parameters POTLL weather forecasting POTLL NtMs and PNtMs POTLL Minine Department Emergency plans POTLL Morine Department Emergency plans POTLL Mrine Department Emergency plans POTLL Mrize Popting POTLL Ter 2 responders PLA Pilotage Directions PLA VTS service PLA ship towage code of practice Ship Towage Bridge Simulation T2 Navigational Risk Assessment	3	3	6	6 3	3	2	6	8	8	8	5.625	Most likely: small fire on board unconnected to bunkering operation. Fire isolated and dealt with by crew. No dmage, no injuries.  Worst credible: fire/explosion caused by malfunctioning equipment leading to injuries on crew on board and loss of oil into dock requiring tier 2 response



		Port of T	ilbury Enclosed Dock Marine Pollution												
Ref.	<b>Hazard</b> What can go wrong	Causes How can it go wrong	Controls  Preventative & Reactive	Ris	Risk scored at Residual level (Most Likely)			Risk scored at Residual level (Worst Credible)				Score			
	(Event leading to a consequence)		(What action & how frequent)				Overall Risk			Overall Risi			,	Risk Sc	
				Likelihood	People	Property	Environment	Business	Likelihood	People	Property	Environment	Business	Hazard	Most Likely/Worst Credible Scenarios
1.1	Loss of Containment (oil product)	Collision Contact Grounding Poor Decision Making Technical Failure	POTLL Marine Department scheduling POTLL Bunkering procedure and checklist POTLL Survey and Dredging program POTLL Marine Guidelines and Port information POTLL Marine Department Emergency plans POTLL OPRC POTLL Ruling Depth document POTLL UKC POTLL Tier 2 responder Lock Gates POTLL Berthing Advisors PLA Ship Towage Code of Practice Ship Towage	4	4	4	8	4	1	1	4	4	4	4.125	Most Likely: Small spill on deck during bunker operations, with small amount of product entering the dock, and dealt with by the vessel and port . No injuries, , No disruption to the Port  Worst credible: Collision between manouevring vessel and moored vessel punctures a fuel tank resulting in substantial release of fuel into the dock. Tier 2 response required. Substantial disruption to the Port.

		Port of	Tilbury - Non Tidal Diving Operations												
Ref.	Hazard What can go wrong	Causes How can it go wrong	Controls  Preventative & Reactive	Risk scored at Residual level (Most Likely)		level				Risk scored at Residual level (Worst Credible)				core	
	(Event leading to a consequence)		(What action & how frequent)		Overall Risk			Overall Risk				Risk S			
				Likelihood		Property	Environment	Business	Likelihood	People	Property	Environment	Business	Hazard I	Most Likely/Worst Credible Scenarios
1.1	Swamping / turbulence / interaction	Proximity and/or speed of Passing Traffic	Forth Ports Dive Procedure (Permit) Marine Department scheduling Exclusion Zones Speed Restrictions POTLL Notice to Mariners POTLL Marine Guidelines and Port Information Dive Supervisor Local Monitoring	3	3	3	3	3	2	10	2	2	8	4.25	Most Likely: Diving operations interupted due to wash from passing/manouevring traffic. No damage to equipment, diving ops continue  Worst Credible: Severe injury caused to diver due to wash from passing/manouevring traffic. Rescue operation required, disruption to Port
1.2		Proximity and/or Speed of Passing Traffic	Forth Ports Dive Procedure (Permit) Established Communications Marine department scheduling Exclusion Zones POTLL Marine Guidelines and Port Information POTLL Notice to Mariners	2	4	4	2	2	1	5	3	2	4	3.25	Most likely: Vessel manourving for berth has a low speed low energy collision with a dive vessel. Minor injury, minor damage to dive vessel, dive operation delayed, no disruption to Port.  Worst Credible: Vessel manoueving for berth has a high energy collision with dive vessel. multiple injuries on board dive boat and death of diver, rescue operation, damage to dive boat and disruption to Port.

		Ports of Till	bury and Tilbury 2 - Tidal Diving Operat	ions											_		
Ref.	Hazard  What can go wrong (Event leading to a consequence)	Causes  How can it go wrong	Controls  Preventative & Reactive (What action & how frequent)	R	Risk scored at Residual level (Most Likely)		level (Most Likely)					Risk scored at Residual level (Worst Credible) Overall Risk			)	ard Risk Score	
				Likelihood	People	Property	Environment	Business	Likelihood	People	Property	Environment	Business	Hazard	Most Likely/Worst Credible Scenarios		
1.1	Swamping / turbulence / interaction	Proximity and/or speed of Passing Traffic	Forth Ports Dive Procedure (Permit) Marine Department scheduling POTLL Notice to Mariners POTLL Marine Guidelines and Port Information PLA VTS Service PLA byelaws and General Directions PLA Notice to Mariners PLA Dive Permit Pla Pilotage Directions PLA Exclusion Zones PLA Speed Restrictions Bridge Simulation T2 Navigational Risk Assessment Bridge Simulation	3	3	<b>3</b>	3 3	3	1	4	3	3	5	3.375	Most Likely: Diving operations interupted due to wash from passing/manouevring traffic. No damage to equipment, diving ops continue  Worst Credible: Sever injury caused to diver due to wash from passing/manouevring traffic. Rescue operation requireed, disruption to Port		
1.2	Contact / Collision	Proximity and/or Speed of Passing Traffic	Forth Ports Dive Procedure (Permit) Marine department scheduling POTLL Marine Guidelines and Port Information POTLL Notice to Mariners PLA VTS Service PLA Notice to Mariners PLA Diver Permit PLA Pilotage Directions PLA Exclusion Zones PLA Speed Restrictions Bridge Simulation T2 Navigational Risk Assessment	3	3	3 3	3 3	3	1	4	4	4	5	3.625	Most likely: Vessel manourving for berth has a low speed low energy collision with a dive vessel. Minor injury, minor damage to dive vessel, dive operation delayed, no disruption to Port.  Worst Credible: Vessel manouevring for berth has a high energy collision with dive vessel. multiple injuries on board dive boat and to diver, rescue operation, damage to dive boat and disruption to Port.		

		Port of	Tilbury - Non tidal Towage Operation	S											
Ref.	Hazard  What can go wrong (Event leading to a consequence)	Causes  How can it go wrong	Controls  Preventative & Reactive (What action & how frequent)	Ris		lev Most I			Ris	(Wor	red at level st Cre	dible	·)	Risk Score	
				Likelihood	People	Property	Environment	Business	Likelihood	People	Property	Environment	Business	Hazard R	Most Likely/Worst Credible Scenarios
1.1	Capsizing / Flooding	Girting Loss of Stability Grounding Technical Failure Human Error Environmental Conditions Tug Positioning Speed	Marine Department Scheduling POTIL Permit to Manouevre POTIL I Permit Notice to Mariners POTIL Permanent Notice to Mariners POTIL Emergency Plans POTIL Lemergency Plans POTIL Weather Forecasting POTIL Weather Forecasting POTIL Weather parameters PLA Ship Towage Code of Practice PLA Craft Towage Code of Practive Ship Towage POTIL Berthing Advisors	2	2	2 6	5 4	4	2	10	10	œ	89	6.5	Most Likely: Mechanical failure causes vessels engine room to flood. Bilge pumps are adequate and able to keep vessel affloat until repairs are made. No Injuries, minor damage to the tug, potential delay to vessel berthing/unberthing. Vessel unable to continue towage operations  Worst Credible: Vessel causes tug girling, due to sudden movement away from the tug, capsize, pollution, salvage operation on the tug, potential loss of life
1.2	Fire	Loss of Containment Grounding Technical Failure Human Error Environmental Conditions	Marine Department Scheduling POTIL Permit to Manouevre POTIL Notice to Mariners POTIL Permanent Notice to Mariners POTIL Emergency Plans POTIL Emergency Plans POTIL Weather Forecasting POTIL Weather Forecasting POTIL Weather parameters PLA Ship Towage Code of Practice PLA Craft Towage Code of Practive Ship Towage POTIL Berthing Advisors	3	3	3 3	3 3	i 6	2	10	10	2	8	5.625	Most Likely: Small fire due to equipment failure, dealt with by onboard FFE. No injuries, very minor damage, no impact on the Port.  Worst Credible: Large engine room fire, cannot be dealt with by on board FFE, major damage to vessel, resulting in deaths, disruption to port services.
1.3	Contact	Technical Failure Loss of Tow / Towline Failure Bridge Team Error Environmental Conditions Change to Shore Infrastructure / Obstruction on the Quay Floating Debris Tug Positioning	Marine Department scheduling POTIL Permit to Manouevre POTIL Notice to Mariners POTIL Permanent Notice to Mariners POTIL Permanent Notice to Mariners POTIL Emergency Plans POTIL UPRC POTIL Weather Forecasting POTIL Weather Forecasting POTIL Weather parameters PLA Ship Towage Code of Practice PLA Craft Towage Code of Practice Ship Towage POTIL Berthing Advisors	5	5	5 5	5 5	i 5	2	6	10	2	10	6	Most Likely: Light contact made with quay during towage operations. minor damage to tug / quayside, towage operation continues, no disruption to Pert.  Worst Credible: Tow line parts during towage operation leading to heavy contact with quayside. Damage to tug, significant damage to quayside / lock gates, towage operations aborted, minor disruption to the Port
1.4	Collision	Technical Failure Loss of Tow / Towline Failure Bridge Team Error Environmental Conditions	Marine Department scheduling POTIL Permit to Manouevre POTIL Notice to Mariners POTIL Emergency Plans POTIL Dermanent Notice to Mariners POTIL Emergency Plans POTIL Usether Forecasting POTIL Weather Forecasting POTIL Weather parameters PLA Ship Towage Code of Practice PLA Craft Towage Code of Practice Ship Towage POTIL Berthing Advisors	3	3	3 3	3 3	1 3	2	6	8	2	8	4.5	Most Likely: Minor collision between tug and towed vessel, superficial damage to one or both vessels. No injuies, towage operation continues, no disruption to the Port.  Worst Credible: Tug undertaking towage operations has an impact with another manoueving vessel causing significant damage to one or both vessles, multiple minor or single major injury. Disruption to Port.
	Grounding	Technical Failure Bridge Team Error Environmental Conditions	Marine Department Scheduling Byelaws & General Directions Emergency Plans Weather Forecasting / Tidal Predications Marine Guidelines & Port Information Towage Guidelines Notice to Mariners PLA Ship Towage Code of Practice PLA Craft Towage Code of Practice Ship Towage POTLL Berthing Advisors	2	2	2 2	2 2	! 2	2	2	2	2	6	2.5	Most Likely: tug goes aground manouerving vessel near berth, clears obstruction with engines and continues manouvre.  No damage, no injuries, no disruptiopn to the Port.  Worst Credible: Tug and deep drafter vessel take to ground during unberthing, cannot rfloat without assistance. No  injuries, delays and cancelled arrivals, moderate disruption to the Port
1.5	Man Overboard / Personal Injury	Human Error Technical Failure Enviromental Conditions	POTLL LSA POTLL weather forecasting POTLL Wind parameters POTLL Restricted visibility procedures PLA Ship Towage Code of Practice PLA Craft Towage Code of Practice Ship Towage POTLL Berthing Advisors	2	2	2 2	2 2	. 2	2	10	2	2	8	3.75	Most Likely: Crew member falls overboard is recovered with minor injuries  Worst Credible: Crew member falls overboard is not recovered and dies



		Port o	of Tilbury - Tidal Towage Operations											1	
Ref.	Hazard  What can go wrong (Event leading to a consequence)	Causes How can it go wrong	Controls Preventative & Reactive (What action & how frequent)	Ris	(M	lev lost l	at Res	)	il R		lev orst C	rel .	,	k Score	
				Likelihood	People	T.	ŧ	Business	poodilati	- Inne	Property	7	Business	Hazard Risk	Most Likely/Worst Credible Scenarios
1.1	Capatizing / Flooding	Girling Groundig Groundig Groundig Groundig Feshinal	Marine Department Scheduling POTIL Notice to Mariners POTIL Permanent Notice to Mariners POTIL Permanent Notice to Mariners POTIL Permanent Notice to Mariners POTIL Marine Coldenies and Por Information POTIL OPPOSITOR PRINTED POTIL Weather parameters POTIL Weather parameters POTIL Weather parameters PLA Ship Towage Code of Practice PLA Phylographic Code of Practice PLA Phylographic Structure PLA Pittage Directions PLA Total reformation PLA Total reformation PLA Byeleves and General Directions Bridge Simulation	3	3	6	; 3	3	s 2		3 6	6	8	5375	Mort Likaly, Mechanical falura, is attern gland, causer vessels engine nom to flood and a loss of stability, Bilgo pumps are adequate and alter to isep-vessel affoot until repairs are made. No expredit, micro damage of the log potential delay to vessel barthright beaching.  Worst Credible: Large deep drafter vessel causes log griting due to straight line speed inbound for London Container Terminol. log capazios, for 1 publicios, salvage operation on the log, potential loss of Bills, major description to the terminol.
1.2	Fire	Loss of Containment Grounding Technical Failure Human Error Environmental Conditions	Marine Department scheduling POTIL. Notice to Mariners POTILE Emergency Plans POTIL Emergency Plans POTIL OPERC POTIL OWNER POTIL OWNER POTIL OWNER POTIL Marine Guidelines & Port Information PIA Ship Towage Code of Practice PIA Craft Towage Code of Practice PIA Craft Towage Code of Practice PIA Craft Towage Code of Practice PIA PA Craft Towage Code of Practice PIA PA Craft Towage Towage Code of Practice PIA PA Marine State Of the Code Code Code Code Code Code Code Cod	3	3	6	i 3	3	3 2		5 8	6	8	5.375	Most Likely. Small fire due to quipement failure, death with by orboard FFE. No injuries, very minor damage, no impact on the Port.  Worst Chedible: Large engine room fire on board cursise ship berified at Yilbury Landing Stage, cannot be death with by on board FFE, impor damage to vissed, single major injury, disruption to Port.
1.3	Contact	Technical Fabrra Loss of Tow / Towline Failure Environmental Conditions Charge to Shore Infrastructure / Obstruction on the Quay Floating Debris Tug Positioning	Marine Department Scheduling POTIL Notice to Mariners POTIL Permanent Notice to Mariners POTIL Dermanent Notice to Mariners POTIL Marine Guidelins and Pot Information POTIL Clemegency Plans POTIL Weather Forceasing POTIL Weather Forceasing POTIL Weather parameters POTIL Scheduling Code of Practice POTIL Scheduling Poticion POTIL Scheduling Poticion PLA Ship Towage Code of Practice PLA Pictage Directions PLA Pictage Clemetric PLA Pictage	4	4	4	: 4	4	: 3		. 8	6	8	5.25	Most Likely Light contact made with quay during breage operations. Minor/superficial damage to lag, no damage to quayside, terage operation continues, no disreption to Port.  Worst Credible: bit has been during to legacy operation leading to heavy contact with quayside. Damage to lag, significant concerts damage to queyside, beggap operations alterned, more damage to the Port
1.4	Collision	Technical Failure Loss of Tow/ Towline Failure Bridge Team Error Environmental Conditions	Marine Department Scheduling POTIL Notice to Mariners POTIL Dermanent Notice to Mariners POTIL Bermanent Notice to Mariners POTIL Marine Guidelins and Pot Information POTIL Clemegency Plans POTIL Weather Forceasing POTIL Weather Forceasing POTIL Weather Portaction PAL Ship Towage Code of Practice PILA Ship Towa	3	3	6	i 3	3	3 2		3 8	2	8	5.125	Most Likely Minor collision between key and towed vessel, superficial damage to one or both vessels. No hijdes, towage operation continues, no disruption to the Plott.  Worst Chedible: Tug undertaking broage operations has a mid-high energy impact with another manouvering vessel causing significant damage to one or both vessels, multiple minor or single major injury. Disruption to Plott.
1.5	Grounding	Technical Failure Bridge Team Error Environmental Conditions	Marine Department Scheduling POTIL Notice to Mariners POTIL Permanent Notice to Mariners POTIL Bermanent Notice to Mariners POTIL Marine Quidelins and Pot Information POTIL Emergency Plans POTIL Weather Forcasting POTIL Weather Forcasting POTIL Weather Porcasting POTIL Weather parameters PLA Ship Towage Code of Practice PLA Craft Towage Code of Practice PLA Craft Towage Code of Practice PLA Platage Universities PLA Platage Information PLA Platage Information PLA Modice tol MAriners PLA Bytalwa and General Directions Bridge Simulation	3	3	3	3	3	2		2 6	2	8	3.75	Most Likely- big gase aground manouring vessel near berth, clears obstruction with engines and continues manouries. No damage, no rejurtes, no disruption to the Port.  Worst Credible: Tug and deep drafter vessel take to ground during unberthing, cannot rifloat without assistance. No injuries, delays and cancelled annuals, moderate damaging to the Port.
1.6	Man Overboard / Personal Injury	Human Error Technical Failure Environmental Conditions	FOTILL ISA  FOTIL weather forecasting  FOTIL Wind parameters  POTIL Restricted visibility procedures  PLA Ship Towage Code of Practice  PLA Craft Towage Code of Practice  PLA Craft Towage Code of Practice  PLA VIS Service  PLA VIS Service  PLA VIS Service  PLA VIS Service  PLA Tidal Information  PLA Service Advances  PLA Tidal Information  PLA Notice In Mannered  Bridge Simulation  Bridge Simulation	3	3	3	. 3	3	2	1	0 2	2	10	4.5	Most Likely. Minor hand injury whilst working lines. Minter first all administered on board. No disaption to the Port  Worst Credible: Crew member on log struck by parted low line, likely tatality. Severe disaption to the port.



		Port of	f Tilbury 2 - Tidal Towage Operations											Ī	
Ref.	Hazard What can go wrong	Causes How can it go wrong	Controls Preventative & Reactive	Ris		leve	at Res el .ikely)	idual			red a leve	ı		core	
	(Event leading to a consequence)		(What action & how frequent)	Likelihood	People		Euvironment Euvironment	Business	Likelihood	People	Oversi https://doi.org/10.000/10.0000	Environment Environment	Business	Hazard Risk Score	Most Likely/Worst Credible Scenarios
1.1	Capsizing / Flooding	Girting Loss of Stability Grounding Grounding Tachhoal Failure Human Error Tug Positioning Speed	MArine Department scheduling POTIL Notice Nutrieners POTIL Permanent Notice to Mariners POTIL Permanent Notice to Mariners POTIL Warine Department Emergency Plans POTIL Washer Forecasting POTIL Washer Forecasting POTIL Permanent Permane	2	2 .	4	4	2	1	3	4	4	5	35	the Likely Mechanical failure, is alone gland, causes versals regime room to flood and a base of stability, foliap courses are adequate and alide to been vessel affort until repairs are made, no injuries, miror damage of the log, potential datey to vessel benthing/unbanhing in made.  No injuries, miror damage of the log, potential datey to vessel benthing/unbanhing in made.  Worst Credible: Ship causes to ggiring due to straight line speed infound for TZ, tog captine, list 1 pollution, salvage operation on the tog, potential loss of life, major damption to the summa.
	Fire	Loss of Containment Grounding Technical Failure Human Error Environmental Conditions	Matrine Department scheduling POTIL Byelwas & General Directions POTIL Márine Department Emergency Plans POTIL OFFICE POTIL OFFICE POTIL OFFICE POTIL Weather Forecasting POTIL Marine Guidelines & Port Information POTIL Motice to Mariners POTIL Motice of Practice PIA Ship Towage Code of Practice PIA Craft Towage Code of Practice PIA Craft Towage Code of Practice PIA Pilotage Directions PIA Milotage Directions Ship Towage	2	2	4	2	2	1	4	4	4	5	3.375	Most Likely. Small fire due to quipement failure, death with by onboard FFE. No Injurites, very minor demage, no impact on the Port.  Worst Credible: Large engine room fire on board cruuse ship berthed at Tilbury Landing Stage, cannot be deat with by on board FFE, major demage to vessel, angle major injury, disruption to Port.
1.3	Contact	Technical Failure Loss of Tow / Towline Failure Bridge Team Error Environmental Conditions Change in Shore Infrastructure Change in Shore Infrastructure Todating Daries Tought Shore Tough	Marine Department scheduling Byelaws & General Directions Emergency Plans Weather Forcessing / Tidal Predications Marine Gudelines & Port Information Marine Gudelines & Port Information Notice to Mariners Tug SMS PLA Ship Towage Code of Practice PLA Chaff Towage Code of Practice PLA Chaff Towage Code of Practice PLA Flotage Directions PLA Pilotage Directions PLA Pilotage Directions PLA Vital Service PLA Tidal Information PLA Notice to Mariners PLA Ship Towage Ship Towag	3	3	6	3	3	2	4	æ	2	8	4.625	Most Linely Light contact made with delphin during towage operations. Minoring-principal damage to buy, no demays to quayadin, towage operation continues, no disruption to Port.  Worst Credible: bif ow line parts during towage operation leading to heavy contact with quayadic. Demays to sup, significant concerts damage to quayadid, towages operations electriced, minor damagelon to the Port.
1.4	Collision	Technical Failure Loss of Tow/Towline Failure Bridge Team Error Environmental Conditions	MArine Department scheduling POTIL Emergency Plans POTIL Weather Forecasting POTIL Wather Forecasting POTIL Marine Guidelines & Port Information PLA Ship Towage Code of Practice PLA Graft Towage Code of Practice PLA Pictosge Directions PLA VTS Service PLA TiScal information PLA Todal information PLA Solice to Microsation PLA Solice to Microsation Singia Simulation T2 Novigational Risk Assessment	2	2	6	2	2	1	4	5	2	5	3.5	Most Likely. Minor collision between kug and rowed vessel, superficial damage to one or both vessels. No injuries, towage operation continues, no disruption to the Port.  Worst Credible: Tug undertaking towage operations has a midshigh energy impact with another manowering vessel causing significant damage to one or both vessels, multiple minor or single migor injury. Disreption to Port.
1.5	Grounding	Technical Failure Bridge Team Error Environmental Conditions	Marine Department Scheduling POTIL Emeragency Plans POTIL Weather Forecasting POTIL Washer Forecasting POTIL Marine Guidelines & Port Information POTIL Notice to Mariners PLA Ship Towage Code of Practice PLA Charl Towage Code of Practice PLA Charl Towage Code of Practice PLA Charles PLA Tissa levice PLA Tissa levice PLA Hydrographic survey PLA Tissal information PLA Notice to Mixiners PLA Bydelwa and General Directions Ship Towage Ship Towage Ship Singa Simulation TZ Navigational Risk Assessment	2	2	2	2	2	1	1	4	2	5	2.5	Most Likely: tog goes aground manourving vessel near bertih, dears obstruction with engines and continues manouvre. No damage, no injuries, no disruptiops to the Port.  Worst Credible: Tug and deep drafter vessel take to ground during unberthing, cannot iffour without assistance. No injuries, delays and cancelled armosts, moderate disruption to the Port
1.6	Man Overboard / Personal Injury	Human Error Technical Failure Environmental Conditions	POTIL LISA POTIL wanther forecasting POTIL Wind parameters POTIL Restricted visibility procedures PLA Ship Towage Code of Practice PLA VIST Service PLA Ship Towage Code of Practice PLA Wind Service PLA Ship Towage Code of Practice PLA Ship Code Code Of Practice PLA S	3	6	6	3	3	1	5	2	2	5	4	Most Likely. Minor hand injury whilst working lines. Minbor first aid administered on board. No discupsion to the Port.  Word Craftible: Crea member on lug situack by parted tow line, likely fatality. Severe disruption to the port.