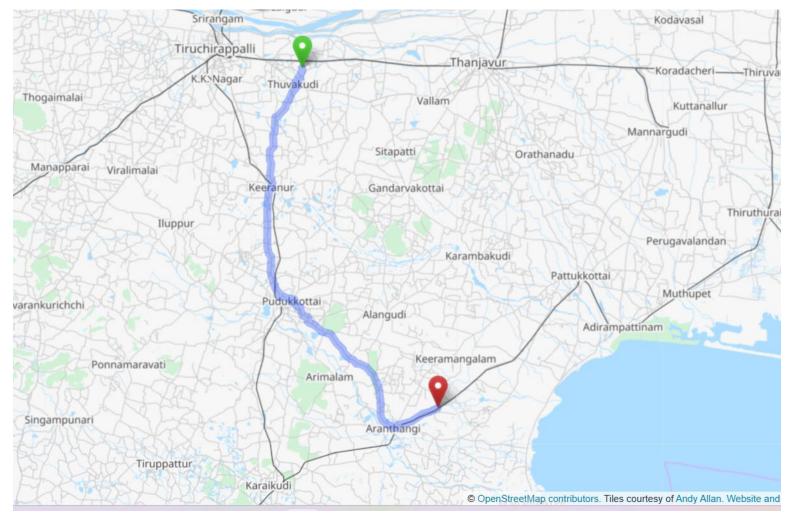
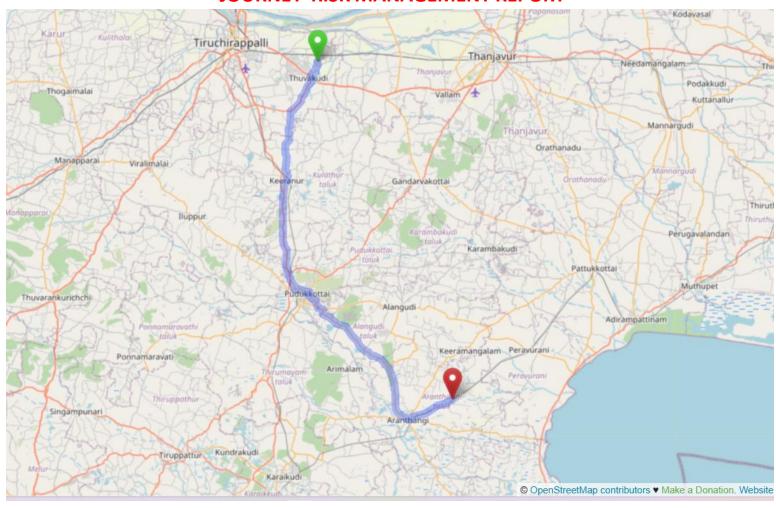


# WELCOME TO JOURNEY RISK MANAGEMENT (JRM) STUDY USING ARTIFICIAL INTELLIGENCE (AI) FOR IOCL TRICHY TERMINAL

# IOCL TIRCHY TERMINAL (10.7753, 78.8368) TO M/S. SRI KAMATCHIAMMAN PETROL BUNK (10.203026 , 79.068932) TOTAL DISTANCE – 92.7 KM





# Welcome to the Journey Risk Management Study for G.S.S. <u>ENTERPRISES</u>

Total distance: 92.7 KM; Start with: (10.7753, 78.8368), End with: (10.203026, 79.068932)

- Route Safety Analysis Report
- 1. Overview of the Route Map

The route from Trichy Terminal (T.N). TO GSS ENTERPRISES Take IS Take SIDCO to Indian oil Storage to NH 83 in Thuvakudi, At Jude Digital Studios,

continue onto Thuvakudi toSIDCO& Indian oil Storage, Take Outer Ring Rd/Trichy Bypass to Kanthalur Rd in Sooriyur, Continue on Kanthalur Rd to Pallathuppatti, urn left at AMMAN CARS& BIKES onto NH336, Turn right onto SH 20. and Total distance from Trichy Terminal To M/S. SRI KAMATCHIAMMAN PETROL BUNKIS 92.7 KM.

#### **Typical Weather Conditions and Potential Weather-Related Hazards**

Weather Conditions: Trichy Terminal (T.N) To M/S. SRI KAMATCHIAMMAN PETROL BUNKexperiences a tropical climate with heavy monsoon rains from June to September, high humidity, and moderate temperatures throughout the year ,The summers are short and sweltering; the winters are short, cool, and dry; and it is mostly clear year- round. Over the course of the year, the temperature typically varies from 60.8°F to 110°F and is rarely below 60.8°F to 110°F.

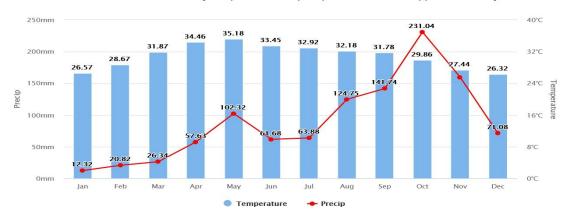
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Nov	Oct	Dec	Year
Record high °C (°F)	33.0	38.0	41.0	43.0	43.0	42.0	40.0	39.0	38.0	37.0	34.0	33.0	43.0
	(91.4)	(100.4)	(105.8)	(109.4)	(109.4)	(107.6)	(104.0)	(102.2)	(100.4)	(98.6)	(93.2)	(91.4)	(109.4)
Average high °C (°F)	30.27	32.88	36.0	38.27	38.79	36.78	36.17	35.4	35.03	32.9	30.38	29.34	34.35
	(86.49)	(91.18)	(96.8)	(100.89)	(101.82)	(98.2)	(97.11)	(95.72)	(95.05)	(91.22)	(86.68)	(84.81)	(93.83)
Daily mean °C (°F)	26.57	28.67	31.87	34.46	35.18	33.45	32.92	32.18	31.78	29.86	27.44	26.32	30.89
	(79.83)	(83.61)	(89.37)	(94.03)	(95.32)	(92.21)	(91.26)	(89.92)	(89.2)	(85.75)	(81.39)	(79.38)	(87.6)
Average low °C (°F)	19.88	20.93	24.04	27.62	28.89	27.59	27.04	26.45	25.95	24.64	22.43	20.93	24.7
	(67.78)	(69.67)	(75.27)	(81.72)	(84.0)	(81.66)	(80.67)	(79.61)	(78.71)	(76.35)	(72.37)	(69.67)	(76.46)
Record low °C (°F)	16.0	17.0	19.0	22.0	25.0	25.0	24.0	23.0	22.0	21.0	18.0	17.0	16.0
	(60.8)	(62.6)	(66.2)	(71.6)	(77.0)	(77.0)	(75.2)	(73.4)	(71.6)	(69.8)	(64.4)	(62.6)	(60.8)
Average precipitation mm (inches)	12.32 (0.49)	20.82 (0.82)	26.34 (1.04)	57.63 (2.27)	102.32 (4.03)	61.68 (2.43)	63.88 (2.51)	124.75 (4.91)	141.74 (5.58)	231.04 (9.1)	159.62 (6.28)	71.08 (2.8)	89.44 (3.52)
Average precipitation days (≥ 1.0 mm)	3.09	3.27	5.36	7.36	16.73	12.36	13.55	18.91	19.64	22.73	17.55	9.73	12.52
Average relative humidity (%)	72.01	65.19	58.27	53.97	51.56	50.59	51.14	56.11	60.33	70.18	77.39	76.61	61.95
Mean monthly sunshine hours	11.19	11.34	11.34	11.63	12.65	12.68	11.83	11.24	11.05	9.11	7.68	8.29	10.84

<u>Weather-Related Hazards:</u> Trichy Terminal (T.N) To M/S. SRI KAMATCHIAMMAN PETROL BUNKProviding a local hourly weather forecast of rain, sun, wind, humidity and temperature.

The Long-range 12 day forecast also includes detail for weather today. Live weather reports from Trichy Terminal (T.N) To M/S. SRI KAMATCHIAMMAN PETROL BUNKweather stations and weather warnings that include risk of thunder, high UV index and forecast gales.

#### Climate Graph

The chart below shows the mean monthly temperature and precipitation of Tiruchirappalli in recent years.



# **Analysis of Traffic Patterns**

#### **Peak Hours:**

Typically, Trichy Terminal (T.N) To M/S. SRI KAMATCHIAMMAN PETROL BUNKpeak traffic hours are from 8:00 AM to 11:00 AM and 4:00 PM to 8:00 PM on weekdays.

# **Congestion-Prone Areas:**

- Old Burma Colony
- TIRUCHY PUBLIC SCHOOL
- Wonder World Theme Park
- Goverment TB Hospital
- Km food product
- BHARAT PETROLEUM CORPORATION LIMITED BOTTLING PLANT,
- Government Higher Secondary School

# • Assessment of Road Quality and Infrastructure

**Road Quality:** Generally, the roads are well-maintained but can suffer from potholes and water logging on State Highway during the monsoon season.

ALARP/JRM/TNSO/SRIKAMATCHIAM

**Infrastructure:** Adequate signage, street lighting, and traffic signals are present, but some areas may lack proper drainage systems, leading to waterlogging.

#### • Suggestions for Alternative Routes for Emergencies

Alternative Route 1- ). The route from Trichy Terminal (T.N). TO GANESG PETROL BUNK Take IS Take SIDCO to Indian oil Storage to NH 83 in Thuvakudi, At Jude Digital Studios, continue onto Thuvakudi to SIDCO& Indian oil Storage, Take Outer Ring Rd/Trichy Bypass to Kanthalur Rd in Sooriyur, Continue on Kanthalur Rd to Pallathuppatti, turn left at AMMAN CARS& BIKES onto NH336, Turn right onto SH 20.

Alternative Route 2 -). Take SIDCO to Indian oil Storage to NH 83 in Thuvakudi, At Jude Digital Studios, continue onto Thuvakudi toSIDCO& Indian oil Storage, Take NH336 to SH 201 in Namanasamuthiram, Turn right onto SH 201.

#### Summary of Local Regulations Affecting Hazardous Material Transport

Regulations: Transport of hazardous materials is regulated by the Petroleum and Explosives Safety Organization (PESO) and the Motor Vehicles Act. Specific routes and timings may be restricted for hazardous material transport.

Permits: Ensure all necessary permits and documentation are in place.

## • Overview of Historical Incidents

Historical Incidents: There have been occasional incidents involving heavy vehicles, particularly during the monsoon season due to waterlogging and poor visibility. No major incidents involving hazardous materials have been reported recently.

#### Environmental Considerations and Sensitive Areas

- Sensitive Areas: Old Burma Colony, TIRUCHY PUBLIC SCHOOL, Wonder World Theme Park, Government TB Hospital, Km food product, BHARAT PETROLEUM CORPORATION LIMITED BOTTLING PLANT.
- Educational institutions: State Institute Of Hotel Management and Catering Technology, Arasu Education Jcb Institute in Trichy, Gnanam School of Business.
- Hospital: Dr Kamali's Home Clinic, Aruna Hospital,
- Gas Station: IndianOil, Nayara Petrol Pump Nayara Petrol Pump, IndianOil, HP Petrol Pump, IndianOil, Bharat Petroleum, Petrol Pump -Raj Agency.

- **Environmental Impact:** Minimize noise and air pollution, especially in residential and sensitive areas.
- **Air pollution**: Volatile chemicals evaporate during the filling and discharge process, or from leaks.
- **Loss of habitats**: Oil and gas operations can degrade animal habitats and disrupt migratory pathways.
- Oil spills: Oil spills can be devastating for animals and humans.
- **Greenhouse gas emissions**: Oil and gas operations can emit greenhouse gases like methane.
- Analysis of Communication Coverage

Communication Coverage: Generally good throughout the route, but potential dead zones may exist densely built-up areas or underpasses.

Dead Zones: Monitor for any communication blackouts, especially in underpasses or near large buildings.

• Estimated Emergency Response Times: Old Burma Colony, TIRUCHY PUBLIC SCHOOL, Wonder World Theme Park, Government TB Hospital, Km food product, BHARAT PETROLEUM CORPORATION LIMITED BOTTLING PLANT..areas like have quicker response times (15- 20 minutes). Congested areas may experience delays (up to 30-40 minutes).

## **Overall Summary of Risk Assessment**

- **Risk Level:** Moderate to High, especially during monsoon season.
- **Key Risks**: Waterlogging, traffic congestion, and potential communication dead zones.
- **Mitigation Measures**: Plan travel during non-peak hours, ensure proper vehicle maintenance, and have alternative routes and emergency contacts ready and control on the speed limit of the vehicle.
- Road Signage for TT/PT Driver

#### Road Traffic Signs in India

#### Mandatory/Regulatory Signs

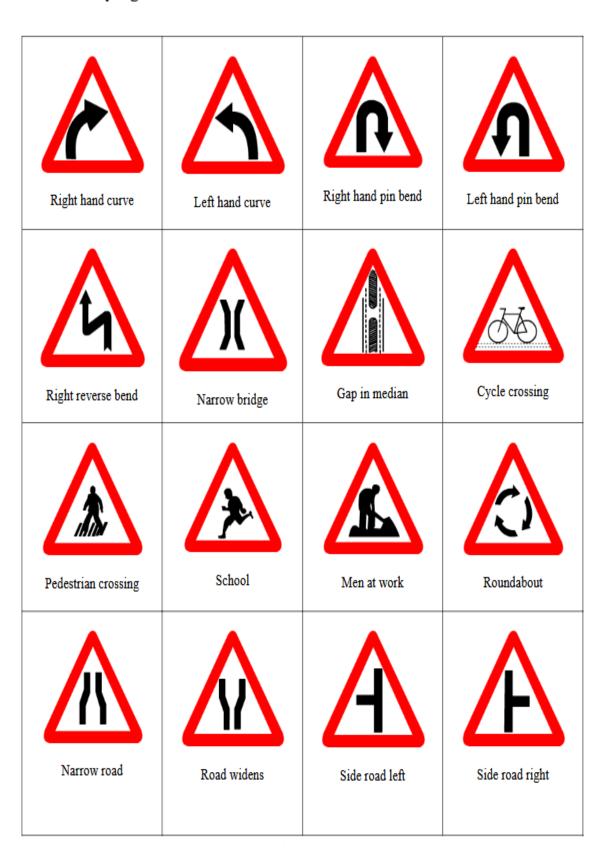




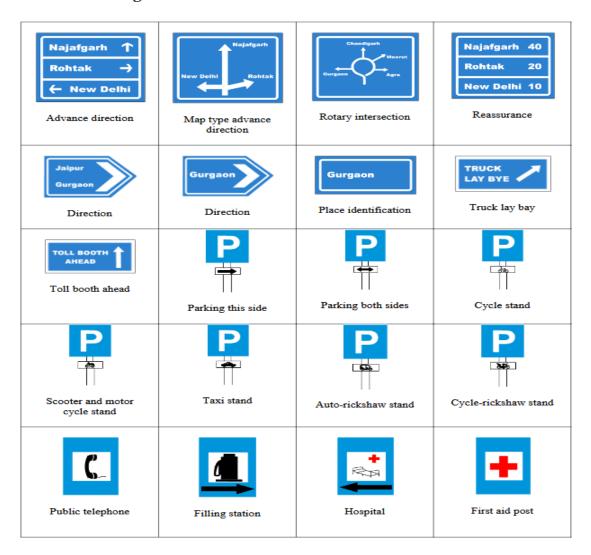


Restriction ands

# Cautionary signs



#### Information signs



#### **Conclusion**

The route for Trichy Terminal (T.N) To M/S. SRI KAMATCHIAMMAN PETROL BUNK is generally manageable but poses several risks, particularly during the monsoon season. Proper planning, adherence to regulations, and awareness of potential hazards can significantly mitigate these risks.

# • Risk Assessment - Sharp Turns

Risk Type	Risk Level	Coordination	Distance From Start	Recommendation Speed
Sharp turn	Medium	10.769517372474736,	650 M	20km/hr TO 30
		78.83735063199906		Km/Hr
Sharp turn	Medium	10.76584461192607,	1.1 KM	20km/hr TO 30
		78.8361700257199		Km/Hr
Sharp turn	Medium	10.764182189802032,	1.3 KM	20km/hr TO 30
		78.83459588401435		Km/Hr
Sharp turn	Medium	10.75826698538096,	2 KM	20km/hr TO 30
		78.83349398474651		Km/Hr
Sharp turn	Medium	10.756372549032195,	2.4 KM	20km/hr TO 30
		78.83034570133539		Km/Hr
Sharp turn	High	10.751346435623256,	3.2 KM	10km/hr TO 15
_	_	78.8252297405902		Km/Hr
Sharp turn	High	10.749451955814655,	3.8 KM	10km/hr TO 15
_	_	78.83046376176118		Km/Hr
Sharp turn	Medium	10.739322086318483,	5.2 KM	20km/hr TO 30
_		78.83809834927386		Km/Hr
Sharp turn	Medium	10.73638358720799,	7.4 KM	20km/hr TO 30
		78.85765706064745		Km/Hr
Sharp turn	Medium	10.733122814995076,	9.4 KM	20km/hr TO 30
		78.87540261560731		Km/Hr
Sharp turn	Medium	10.730613315581481,	12.9 KM	20km/hr TO 30
		78.9075879625983		Km/Hr
Sharp turn	Medium	10.723935824957472,	15.4 KM	20km/hr TO 30
		78.92931083702165		Km/Hr
Sharp turn	Medium	10.720496466902269,	16.6 KM	20km/hr TO 30
		78.93941529718165		Km/Hr
Sharp turn	Medium	10.718227178328238,	17 KM	20km/hr TO 30
		78.94244663522967		Km/Hr
Sharp turn	Medium	10.716915238110442,	17.7 KM	20km/hr TO 30
		78.94868974811423		Km/Hr

Sharp turn	Medium	10.717034532262224,	18 KM	20km/hr TO 30
		78.95121165756625		Km/Hr
Sharp turn	High	10.717266449544763,	18.3 KM	10km/hr TO 15
		78.95436593524407		Km/Hr
Sharp turn	Medium	10.720766270598597,	19.4 KM	20km/hr TO 30
		78.96376439526372		Km/Hr
Sharp turn	High	10.71945911325298,	19.9 KM	10km/hr TO 15
_		78.96003076046141		Km/Hr
Sharp turn	High	10.718657949508776,	20.1 KM	10km/hr TO 15
_		78.95859309648579		Km/Hr
Sharp turn	Medium	10.717241891210914,	20.5 KM	20km/hr TO 30
1		78.95508572420601		Km/Hr
Sharp turn	High	10.716950198660903,	20.6 KM	10km/hr TO 15
F		78.95453759661429		Km/Hr
Sharp turn	Medium	10.71088808615262,	21.3 KM	20km/hr TO 30
1		78.9558416688753		Km/Hr
Sharp turn	High	10.710656163985194,	21.5 KM	10km/hr TO 15
1		78.95781577463286		Km/Hr
Sharp turn	High	10.708611024458909,	21.7 KM	10km/hr TO 15
1		78.95824492805842		Km/Hr
Sharp turn	High	10.672882868891097,	27 KM	10km/hr TO 15
1		78.98920221330918		Km/Hr
Sharp turn	Medium	10.668686633204702,	27.5 KM	20km/hr TO 30
1		78.98958845139218		Km/Hr
Sharp turn	Medium	10.66839141846377,	27.6 KM	20km/hr TO 30
1		78.98960990906346		Km/Hr
Sharp turn	Medium	10.643015219065195,	30.4 KM	20km/hr TO 30
1		78.99498654103147		Km/Hr
Sharp turn	Medium	10.625206404186365,	32.4 KM	20km/hr TO 30
1		78.99565428827928		Km/Hr
Sharp turn	Medium	10.62478460858532,	32.5 KM	20km/hr TO 30
1		78.9957401189644		Km/Hr
Sharp turn	High	10.574357794339809,	38.5 KM	10km/hr TO 15
•		79.01368001472272		Km/Hr
Sharp turn	Medium	10.573825676264207,	38.9 KM	20km/hr TO 30
•		79.01064867667473		Km/Hr

Sharp turn	Medium	10.555280810368673, 78.99235389940597	41.4 KM	20km/hr TO 30 Km/Hr
Sharp turn	High	10.55375530802717,	42.2 KM	10km/hr TO 15
_		78.98932256135797		Km/Hr
Sharp turn	High	10.546659848677978,	43.2 KM	10km/hr TO 15
		78.98491990351165		Km/Hr
Sharp turn	Medium	10.536473949790345,	45.1 KM	20km/hr TO 30
		78.97096810505661		Km/Hr
Sharp turn	Medium	10.412339485186124,	52.7 KM	20km/hr TO 30
		78.78920089118412		Km/Hr
Sharp turn	Medium	10.33797436581919,	53.7 KM	20km/hr TO 30
		78.77159585623242		Km/Hr
Sharp turn	Medium	10.32430094969298,	55.1 KM	20km/hr TO 30
		78.77305191536144		Km/Hr
Sharp turn	Medium	10.31791981838706,	55.8 KM	20km/hr TO 30
		78.77040453491922		Km/Hr
Sharp turn	Medium	10.308152530575784,	56.9 KM	20km/hr TO 30
		78.7681542617198		Km/Hr
Sharp turn	Medium	10.30724090159075,	57 KM	20km/hr TO 30
		78.76881610677844		Km/Hr
Sharp turn	Medium	10.302541918198077,	57.5 KM	20km/hr TO 30
		78.77017507999521		Km/Hr
Sharp turn	Medium	10.302038570141677,	57.8 KM	20km/hr TO 30
		78.76824675640592		Km/Hr
Sharp turn	Medium	10.29980270253144,	58 KM	20km/hr TO 30
		78.7687354288789		Km/Hr
Sharp turn	Medium	10.29929658848644,	58.1 KM	20km/hr TO 30
		78.76892832996461		Km/Hr
Sharp turn	High	10.296323152025716,	58.5 KM	10km/hr TO 15
		78.76843000213276		Km/Hr
Sharp turn	High	10.29371346392934,	58.8 km	10km/hr TO 15
		78.76756194721936		Km/Hr
Sharp turn	High	10.327018063855776,	60.5 KM	10km/hr TO 15
		78.88331868717087		Km/Hr
Sharp turn	High	10.30371168210079,	64.1 KM	10km/hr TO 15
		78.90434720570963		Km/Hr

Sharp turn	Medium	10.294256481238602, 78.90993386055534	65.3 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.285720034156656,	66.6 KM	20km/hr TO 30
Sharp turn	Medium	78.91779328608466 10.283159055015613,	67.4 KM	Km/Hr 20km/hr TO 30
Sharp turn	Medium	78.92468304223047 10.278539196986708,	68.1 KM	Km/Hr 20km/hr TO 30
Sharp turn	Medium	78.9289700016101 10.2777357365199,	68.2 KM	Km/Hr 20km/hr TO 30
	Medium	78.92978656530146 10.275124475568791,	69.5 KM	Km/Hr 20km/hr TO 30
Sharp turn		78.94075914059847		Km/Hr
Sharp turn	Medium	10.271559065645393, 78.94724061489862	70.3 KM	20km/hr TO 30 Km/Hr
Sharp turn	High	10.267336926172407, 78.94923503476609	70.8 KM	10km/hr TO 15 Km/Hr
Sharp turn	High	10.259101067830002, 78.95770688306393	72.1 KM	10km/hr TO 15 Km/Hr
Sharp turn	Medium	10.234571050993244, 78.96821711184472	75.1 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.185820405165583, 78.97194792611964	80.5 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.179441018848737, 78.97603074457642	81.3 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.179039163471295, 78.97761283672843	81.5 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.177180575768153, 78.9795521754954	81.8 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.173313281774066, 78.98708787749014	82.8 KM	20km/hr TO 30 Km/Hr
Sharp turn	Medium	10.172886302221958, 78.98895066341106	83 KM	20km/hr TO 30 Km/Hr
Sharp turn	High	10.172936535140078, 78.9909665550241	83.2 KM	10km/hr TO 15 Km/Hr
Sharp turn	High	10.172635137512824, 78.9919872596383	83.3 KM	10km/hr TO 15 Km/Hr

Sharp turn	Medium	10.172841985153484,	83.4 KM	20km/hr TO 30
		78.99280570076763		Km/Hr
Sharp turn	Medium	10.17290858522967,	83.5 KM	20km/hr TO 30
		78.99394245260054		Km/Hr
Sharp turn	Medium	10.173188305401315,	83.6 KM	20km/hr TO 30
		78.99475892906882		Km/Hr
Sharp turn	Medium	10.173138771670127,	83.9 KM	20km/hr TO 30
		78.99707445762263		Km/Hr
Sharp turn	Medium	10.173098811649657,	84 KM	20km/hr TO 30
		78.9982427858962		Km/Hr
Sharp turn	Medium	10.181268888781265,	87.1 KM	20km/hr TO 30
		79.02553307329877		Km/Hr
Sharp turn	Medium	10.18542049843491,	87.9 KM	20km/hr TO 30
		79.03084357600292		Km/Hr
Sharp turn	High	10.189542187040468,	88.7 KM	10km/hr TO 15
		79.03721617973574		Km/Hr
Sharp turn	High	10.195097422077549,	90 KM	10km/hr TO 15
		79.04692681360889		Km/Hr
Sharp turn	Medium	10.198334275830454,	91.6 KM	20km/hr TO 30
		79.06142807649417		Km/Hr
Sharp turn	Medium	10.202845392408445,	92.6 KM	20km/hr TO 30
		79.06895693697278		Km/Hr

# • Risk Assessment - Elevation Changes

Risk Type	Specific Risk	Risk Level	Coordination	Elevation Change	Gradient	Recommen dation Speed
Elevation Change	Descent	Low	10.7753, 78.8368	-3.02m	-2.96 %	40 km/hr to 50 km/hr
Elevation Change	Descent	Low	10.993921,78.326323	-9.28m	-6.28%	40 km/hr to 50 km/hr

# IOCL TIRCHY TERMINAL (10.7753, 78.8368) TO M/S. SRI KAMATCHIAMMAN PETROL BUNK (10.203026 , 79.068932) TOTAL DISTANCE – 92.7 KM



ALARP/JRM/TNSO/SRIKAMATCHIAM

10.769073692604486, 78.83720120889187



10.764113439530249, 78.83446118711721



10.758209570013967, 78.83344387884853



10.751314343624747, 78.82530656733346



10.75126610223314, 78.82518044583597



10.749591316479634, 78.83018387464983



10.749104378396837, 78.83128038055115



10.739027364156707, 78.83807729846241



10.723600498494587, 78.92918549372726

ALARP/JRM/TNSO/SRIKAMATCHIAM



10.716821349530969, 78.95251175926562



ALARP/JRM/TNSO/SRIKAMATCHIAM



10.711197851415859, 78.95596724397815



10.278051348714806, 78.92721248402118



10.18506479148424, 78.97081336508036



10.177087748855122, 78.9824835063371



10.172787817654841, 78.99168389371607



10.173231426804186, 78.99685898440727



10.180790418998077, 79.02422794728965



10.18914316273173, 79.03671232836403



10.195082026756195, 79.04630026226572



10.20083082244198, 79.06439725109168



10.203003931419502, 79.06878157113425