DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION Interim Final 2/5/99 RCRA Corrective Action Environmental Indicator (EI) RCRIS code (CA725) Current Human Exposures Under Control

Facility Name:	Kimberly-Clark PA, LLC
Facility Address:	Front Street & Avenue of the States, Chester, PA 19013
Facility EPA ID #:	PAD002274991

1. Has **all** available relevant/significant information on known and reasonably suspected releases to soil, groundwater, surface water/sediments, and air, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this El determination?

 $|\mathbf{X}|$ If yes – check here and continue with #2 below.

If no - re-evaluate existing data, or

If data are not available skip to #6 and enter "IN" (more information needed) status code.

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

Definition of "Current Human Exposures Under Control" EI

A positive "Current Human Exposures Under Control" EI determination ("YE" status code) indicates that there are no "unacceptable" human exposures to "contamination" (i.e., contaminants in concentrations in excess of appropriate risk-based levels) that can be reasonably expected under current land- and groundwater-use conditions (for all "contamination" subject to RCRA corrective action at or from the identified facility [i.e., site-wide]).

Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The "Current Human Exposures Under Control" EI are for reasonably expected human exposures under current land- and groundwater-use conditions ONLY, and do not consider potential future land- or groundwater-use conditions or ecological receptors. The RCRA Corrective Action program's overall mission to protect human health and the environment requires that Final remedies address these issues (i.e., potential future human exposure scenarios, future land and groundwater uses, and ecological receptors).

Duration / Applicability of EI Determinations

El Determinations status codes should remain in RCRIS national database ONLY as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

 Are groundwater, soil, surface water, sediments, or air media known or reasonably suspected to be "contaminated"¹ above appropriately protective risk-based "levels" (applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action (from SWMUs, RUs or AOCs)?

	Yes	No	?	Rationale/Key Contaminants
Groundwater Air (indoors) ²	<u>x</u>	<u></u>		Releases to groundwater have been documented for the three AOCs. VOCs, SVOCs and SPL present. Contaminated soil was left in place due to the
				presence of subsurface building structures and underground utility lines, and SPL remains in the subsurface in the No. 2 Fuel Oil Area and the Penn Steel Area. Contamination levels have likely decreased due to natural attenuation and
				contamination is deeper than 5ft.
Surface Soil (e.g., <2 ft)		x		Contamination detected in soil is below 2 feet in depth.
Surface Water		x		Contamination at the facility has likely decreased due to natural attenuation. Additional sampling will be done as ASTs are removed from site.
				e P
Sediment	() <u> </u>	x		Same rationale as surface water.
Subsurf. Soil (e.g., >2 ft)	x		19	Releases to soils from the facility's leaking AST and UST systems and former historic operations unrelated to the facility. VOCs, SVOCs and PAHs present.
Air (outdoors)	19	x		The facility currently operates under a TVOP for various emission units associated with paper manufacturing.
	-			

¹ "Contamination" and "contaminated" describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriately protective risk-based "levels" (for the media, that identify risks within the acceptable risk range).

² Recent evidence (from the Colorado Dept. of Public Health and Environment, and others) suggest that unacceptable indoor air concentrations are more common in structures above groundwater with volatile contaminants than previously believed. This is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration necessary to be reasonably certain that indoor air (in structures located above (and adjacent to) groundwater with volatile contaminants) does not present unacceptable risks.

If no (for all media) - skip to #6, and enter "YE," status code after providing or citing appropriate
 "levels," and referencing sufficient supporting documentation demonstrating that these "levels" are not exceeded.

X If yes (for any media) - continue after identifying key contaminants in each "contaminated" medium, citing appropriate "levels" (or provide an explanation for the determination that the medium could pose an unacceptable risk), and referencing supporting documentation.

If unknown (for any media) - skip to #6 and enter "IN" status code.

Rationale and Reference(s):

The Kimberly-Clark PA, LLC facility (Kimberly-Clark or facility) is situated between State Route 291 and the Delaware River at the intersection of Front Street and Avenue of the States in Chester, Pennsylvania. The facility's operating area consists of 74 acres that has a variety of buildings including process areas, plant offices, and final product storage and distribution warehouses, as well as a raw water filter plant, a cogeneration plant (power plant), and outdoor coal pile storage and handling areas. The majority of the operating area is covered with impermeable surfaces (i.e., buildings and asphalt-paved or concrete roads/parking lots); however, there are relatively small localized gravel areas throughout the property. These areas are located directly north of the mill building (Mill Area Underground Storage Tank [UST] Removal Area), in the vicinity of the raw water filter plant (No. 2 Fuel Oil Area), and along the banks of the Delaware River. In the coal handling and storage area (Penn Steel Area), the western half of the surface consists of asphalt paving. The eastern half of the property is compacted gravel and coal, and the coal storage and handling structures. Topography at the site slopes gently toward the Delaware River with approximately six to 10 feet of relief from Front Street to the Delaware River. Access to the property is limited. A chain link fence surrounds the entire property. The facility is secured by a 24-hour guard service.

The area is an "enterprise zone" designated by the City of Chester planning commission. Other industrial/commercial areas are located adjacent to the facility along the Delaware River. Physician offices are located to the north, Harrah's Casino and Race Track are located directly east, and a highway maintenance department is located to the west of the facility. The Delaware River and the New Jersey/Pennsylvania border form the south/southeast boundary of the facility. Chester Creek flows through the property and separates the coal pile storage and handling area from the facility's operational areas and the cogeneration plant. Kimberly-Clark owns the majority of the surrounding adjacent properties which are used primarily for parking.

Records indicate that the Chester Shipping Company, a ship building facility, operated some areas of the facility from the early 1900s until the 1940s (Atlantic Environmental Consulting Services, LLC [Atlantic], 2000). Scott Paper Company (Scott) took ownership of the property and began operating in 1910. Chester Shipping Company continued to operate in several of the easternmost buildings until the 1940s. Scott then merged with Kimberly-Clark Corporation in December 1995 and the name changed to Kimberly-Clark Tissue Company effective 1996. On December 15, 2000, the facility notified Pennsylvania Department of Environmental Protection (PADEP) that Kimberly-Clark Tissue Company was to be liquidated and the assets were to be distributed to the parent company, Kimberly-Clark Corporation. The ownership and name changed to Kimberly-Clark Pennsylvania, LLC effective January 1, 2003. Collectively, these three entities will be referred to as Kimberly-Clark hereafter. Kimberly-Clark Pennsylvania, LLC continues to maintain operations to date.

Kimberly-Clark currently operates as a small quantity generator (SQG) facility under United States Environmental Protection Agency (USEPA) ID No. PAD002274991. The facility also operates under a Title V Operating Permit (TVOP-23-0014) for air emissions, a National Pollutant Discharge Elimination System (NPDES) permit (PA0013081) for effluent outfall discharges, and a Delaware County Regional Water Quality Control Authority (DELCORA) Industrial

Discharge Permit (1DE 01-04) for discharges of treated wastewater from the manufacture of sanitary paper products, river water clarification, and associated utilities.

The facility obtains its process water directly from the Delaware River via its raw water intake. The raw water is piped from the intake, through the wet well and into the raw water filter plant, where it is treated in three of four clarifiers. The raw river water is mixed with a polymer. The mixture is then gravity settled in sand filters. Clean water is then held in the mill water silo prior to use.

The facility operates a permit-by-rule (PBR) wastewater elementary neutralization system that treats spent sulfuric acid and sodium hydroxide from the demineralizer bed regeneration process in the raw water filter plant. The demineralizer system treats mill supply water (raw water drawn from the Delaware River and/or city water) prior to use as boiler feed water. Treated wastewater (including water removed from the clarifiers during cleaning) generated at the facility is discharged into the DELCORA system under permit.

The facility also operates and maintains its own cogeneration power plant. The cogeneration power plant (Boiler No. 10) provides steam to the mill using anthracite culm mixed with bituminous coal that is obtained from the Poconos area of Pennsylvania. The culm is stored outdoors or in sheds directly on the ground surface in the Penn Steel Area, a 14-acre parcel located directly southwest of, and across Chester Creek from the mill area of the facility.

The Penn Steel Area was formerly utilized as a saw mill and coal yard until the late 1880s and as a steel casting facility by the Penn Steel Casting and Machine Company (Penn Steel), from the early 1890s into the 1960s (Atlantic, 2001). The western portion of the parcel was acquired by Scott in 1971 to undertake a Brownfield's initiative and return the abandoned industrial property into a functional entity of the facility. During the 1970s, Scott paved the Penn Steel Area and utilized it as a parking area for tractor trailers that stored finished goods prior to off-site shipment. In the 1980s, Scott developed the eastern half of the property as coal pile storage and handling areas that support the cogeneration plant. Kimberly-Clark entered into a 100-year lease agreement with the City of Chester in 1985 for the eastern portion of the Penn Steel Area (Atlantic, 2001). The majority of the flat-lying surface of the Penn Steel Area is capped with asphalt and the remaining areas are covered with coal piles, buildings, and coal handling/sorting structures. A buffer zone of small trees and overgrowth lies between the fenced portion of the Penn Steel Area, and Chester Creek and the Delaware River.

There have been major investigations and remedial activities completed at three areas of concern (AOCs): (1) the No. 2 Fuel Oil Area located within the mill area, (2) the Mill Area UST Removal Area, and (3) the Penn Steel Area. Contaminated soil and groundwater were identified in each of the three areas. The facility has requested no further action determinations from PADEP for the No. 2 Fuel Oil Area and the Penn Steel Area; however, available records indicate that formal determinations have not been issued. (Note: These two areas of investigation were not formally entered into the PADEP Land Recycling Program [Act 2].) In addition, while a remediation system was proposed to treat contaminated soil and groundwater at the Mill Area UST Removal Area, facility representatives indicate that no response to the proposal was received from PADEP and the remediation system was never installed.

Waste Types and Quantities

On August 13, 1980, Scott submitted a Notification of Hazardous Waste Activity to USEPA for generation and treatment/storage/disposal (TSD) of hazardous wastes. With its submittal, the facility indicated it was filing as a TSD facility as a precautionary measure in the event wastes would accumulate beyond 90 days due to circumstances beyond its control. The facility was assigned USEPA ID No. PAD002274991 on October 9, 1980.

According to the facility's historical waste permitting documents, hazardous wastes generated at the facility have included:

D-listed wastes D001 (characteristically ignitable); D002 (characteristically corrosive); D003 (characteristically reactive); D007 (chromium); D008 (lead); D009 (mercury); and D039 (tetrachloroethene [PCE])

- F-listed wastes F001 and F002 (spent halogenated solvents) and F003, F004, and F005 (spent non-halogenated solvents)
- P-listed wastes P030 (cyanide) and P105 (sodium azide)
- U-listed wastes U002 (acetone); U044 (chloroform); U122 (formaldehyde); U144 (acetic acid/lead acetate); U154 (methanol/methyl alcohol); U159 (methyl ethyl ketone [MEK]); U226 (1,1,1-trichloroethane [TCA]); and U239 (xylene)

The facility currently operates as a SQG, generating minor quantities of solvents and paint related wastes (brushes, rollers, empty paint cans, etc.). The facility also generates nonhazardous wastes including oil from machine maintenance, waste water-based polymers (glue), fluorescent/sodium vapor light bulbs and ballasts, baghouse wastes, wood wastes, refractory brick, and ash. The facility routinely submits biennial residual waste reports identifying these nonhazardous waste streams.

The paint-related wastes, waste oils, and glue are stored in 55-gallon drums or totes in Building 81 located on the east end of property. The hazardous wastes are stored in a caged area that consists of four bermed sections that are locked at all times. This area also stores empty 55-gallon drums. The light bulbs and ballasts are stored in a universal waste storage area located inside of the mill.

Groundwater: There have been no known releases to groundwater from the facility's regulated hazardous waste accumulation area (Building 81); however, releases to groundwater have been documented for the three AOCs.

Extensive groundwater investigation and remediation work was completed at the No. 2 Fuel Oil Area. Available groundwater data suggests that the removal of separate-phase liquid (SPL) occurred to the extent possible and the operation of the groundwater remediation system was successful at remediating groundwater at and southeast of the source area (Monitoring Well [MW]-1) below appropriate regulatory levels. According to the Final Report (Atlantic, 2000) submitted to PADEP in April 2000, an isolated area of SPL (less than 0.1 inches thick) remains near MW-1. This area is covered with ballast and asphalt surfaces. The most recent groundwater sample, which consisted of groundwater in direct contact with the SPL, was collected from the source area monitoring well (MW-1) in July 1999. The sample was analyzed for the PADEP Short List of Petroleum Products for Fuel Oil Nos. 2, 4, 5, and 6. Low concentrations of benzene (0.3 [J] ug/L), cumene (1.5 ug/L), fluorene (2 [J] ug/L), and phenanthrene (3 [J] ug/L) were detected in the sample. The 1999 concentrations are below the current PADEP used aquifer total dissolved solids (TDS) less than 2,500 milligrams per liter (mg/L) non-residential medium specific concentration (MSCs) of 5 micrograms per liter (ug/L) for benzene: 3,500 ug/L for cumene; 1,900 ug/L for fluorene; and 1,100 ug/L for phenanthrene. Downgradient wells MW-11, SUMP-1, SUMP-2, and GW-1 were last sampled January 1998. These samples were analyzed only for benzene, toluene, ethylbenzene and xylenes (BTEX) and naphthalene, none of which were detected above laboratory detection limits; therefore, it is unknown whether polynuclear aromatic hydrocarbons (PAHs) are present in groundwater southeast of the source area. Soil samples collected directly downgradient of MW-11 and GW-1 in 1998 suggest that these constituents may have been present in groundwater at the time of the sampling although likely at low concentrations. The chemical quality of the groundwater southwest (vicinity of the No. 6 fuel oil aboveground storage tank [AST]) of the source area is unknown. Relatively high total petroleum hydrocarbons (TPH) concentrations were detected in soil samples in the vicinity of the No. 6 fuel oil AST and petroleum odors and sheens were observed on groundwater that infiltrated trenches dug around the bulkhead. No monitoring wells were installed; therefore, no groundwater data is available for this area.

In 1990, concentrations of benzene and ethylbenzene were detected above appropriate regulatory levels in two of the monitoring wells (MW-4 and MW-8) installed directly north of Buildings 20 and 21 in the Mill Area UST Removal Area. The 1990 concentrations of benzene detected in monitoring wells MW-4 (6.4 ug/L) and MW-8 (43 ug/L) are above the current PADEP non-residential MSC of 5 ug/L. The 1990 concentration of ethylbenzene detected in monitoring well MW-8 (1,500 ug/L) is above the current MSC of 700 ug/L. Elevated concentrations of xylenes were also present ranging from 40 ug/L in monitoring well MW-9 to 8,800 ug/L in monitoring well MW-5. These concentrations are below the MSC of 10,000 ug/L for total xylenes. Although a dual-phase vacuum extraction system was proposed to remediate

groundwater, it was reportedly never implemented. Contaminants have likely decreased due to natural attenuation. The UST removal area, particularly directly north of Buildings 20 and 21, is gravel covered.

Groundwater analytical data for the Penn Steel Area suggests that while residual SPL remains, it is no longer degrading groundwater above appropriate regulatory levels. Groundwater samples collected from the groundwater/SPL interface at monitoring wells MW-8 and MW-10 during five sampling events conducted from March 2000 through May 2001 showed that none of the analytes analyzed for were detected above the PADEP non-residential MSCs, except for benzene that was detected at monitoring well MW-8 (6.2 ug/L) above the MSC of 5 ug/L during one sampling event (May 2001). Benzene was not detected in either MW-8 or MW-10 above laboratory detection limits during any of the other sampling events. Removal of the SPL was deemed infeasible because it is present in isolated pockets or discontinuous sheens. According to the Final Report (Atlantic, 2001), the facility maintains the asphalt parking lot that was placed over the former Penn Steel operations, and the areas where SPL was identified.

Groundwater at or in the vicinity of the facility is not used for municipal, domestic, or agricultural use. In addition, the majority of the property is asphalt or concrete covered, and it is not expected that contaminated groundwater or residual SPL would be easily accessible during daily operations. In addition, the facility is entirely fenced and continuously monitored by security, which further limits accessibility to potentially contaminated areas to authorized personnel. Therefore, it is not expected that additional controls are needed for daily operations. However, because groundwater is shallow (three to five feet below the ground surface [bgs]), additional controls may be required for subsurface work (i.e., utility work) that may encounter contaminated groundwater.

Soil: There have been releases to soils at the facility resulting from the facility's leaking USTs and former historic operations unrelated to the facility (Penn Steel Area). These areas have been investigated. Contaminated soil and residual SPL was removed to the extent possible; however, some contaminated soil and SPL was left in place due to the presence of building foundations, underground utilities, and subsurface obstructions. In the No. 2 Fuel Oil Area, high TPH concentrations were detected in soil samples southwest of the recovery wells (SUMP-1 and SUMP-2). The highest concentrations were detected near the bulkhead, northeast of the No. 6 Fuel Oil AST during the 1989 and 1995 investigations. Sheens were also observed in groundwater infiltrating test pits in this area. No additional sampling was conducted in this area after cessation of the recovery wells in 1996. This area is presently gravel-covered. One soil sample collected northwest of (upgradient to) the recovery wells in 1998 contained elevated concentrations of PAHs. The concentrations of the PAHs detected in this sample were generally below the PADEP used aquifer soil to groundwater non-residential MSC, except naphthalene which was detected above the MSC. This sample was collected beneath the asphalt-paved roadway.

Contaminated soil was also left in place in the Mill Area UST Removal Area. Although a dual-phase remediation system was proposed for this area, available documentation suggests it was not installed. The majority of the excavation areas are gravel-covered. In the Penn Steel Area, SPL remains in the subsurface; however, the areas where SPL was observed are asphalt-covered.

It is not expected that contaminated soil or residual SPL would be easily accessible during daily operations. In addition, the facility is entirely fenced and continuously monitored by security, which further limits accessibility to potentially contaminated areas to authorized personnel. Therefore, it is not expected that additional controls are needed for daily operations. However, because some contaminated soil left in place may be shallow, additional controls may be required for subsurface work (i.e., utility work). A SMP is maintained at the facility for the Penn Steel Area. The SMP includes maintenance of the asphalt surface and security fence, and 24-hour security that limits access to authorized personnel.

3. Are there **complete pathways** between "contamination" and human receptors such that exposures can be reasonably expected under the current (land- and groundwater-use) conditions?

Summary Exposure Pathway Evaluation Table

Potential Human Receptors (Under Current Conditions)

"Contaminated Media"	Residents	Workers	Daycare		Trespassers	Recreation	Food3
			0 ²	Construction	*		
Groundwater	No	No	No	Yes*	No	No	No
Soil (subsurface e.g., >2 ft)	No	No	No	Yes*	No	No	No

Instructions for Summary Exposure Pathway Evaluation Table:

1. Strike-out specific Media including Human Receptors' spaces for Media which are not "contaminated" as identified in #2 above.

2. enter "yes" or "no" for potential "completeness" under each "Contaminated" Media -- Human Receptor combination (Pathway).

Note: In order to focus the evaluation to the most probable combinations some potential "Contaminated" Media - Human Receptor combinations (Pathways) do not have check spaces ("___"). While these combinations may not be probable in most situations they may be possible in some settings and should be added as necessary.

- If no (pathways are not complete for any contaminated media-receptor combination) skip to #6, and enter "YE" status code, after explaining and/or referencing condition(s) in-place, whether natural or man-made, preventing a complete exposure pathway from each contaminated medium (e.g., use optional <u>Pathway Evaluation Work Sheet</u> to analyze major pathways).
- X If yes (pathways are complete for any "Contaminated" Media Human Receptor combination) continue after providing supporting explanation.

Rationale and Reference(s):

Additional controls will be needed to mitigate construction on site.

³ Indirect Pathway/Receptor (e.g., vegetables, fruits, crops, meat and dairy products, fish, shellfish, etc.)

- 4. Can the **exposures** from any of the complete pathways identified in #3 be reasonably expected to be "significant"⁴ (i.e., potentially "unacceptable" because exposures can be reasonably expected to be: 1) greater in magnitude (intensity, frequency and/or duration) than assumed in the derivation of the acceptable "levels" (used to identify the "contamination"); or 2) the combination of exposure magnitude (perhaps even though low) and contaminant concentrations (which may be substantially above the acceptable "levels") could result in greater than acceptable risks)?
 - X If no (exposures can not be reasonably expected to be significant (i.e., potentially "unacceptable") for any complete exposure pathway) - skip to #6 and enter "YE" status code after explaining and/or referencing documentation justifying why the exposures (from each of the complete pathways) to "contamination" (identified in #3) are not expected to be "significant."
 - If yes (exposures could be reasonably expected to be "significant" (i.e., potentially "unacceptable") for any complete exposure pathway) - continue after providing a description (of each potentially "unacceptable" exposure pathway) and explaining and/or referencing documentation justifying why the exposures (from each of the remaining complete pathways) to "contamination" (identified in #3) are not expected to be "significant."

If unknown (for any complete pathway) - skip to #6 and enter "IN" status code

Rationale and Reference(s):

5. Can the "significant" exposures (identified in #4) be shown to be within acceptable limits?

If yes (all "significant" exposures have been shown to be within acceptable limits) - continue and enter "YE" after summarizing and referencing documentation justifying why all "significant" exposures to "contamination" are within acceptable limits (e.g., a site-specific Human Health Risk Assessment).

If no (there are current exposures that can be reasonably expected to be "unacceptable") - continue and enter "NO" status code after providing a description of each potentially "unacceptable" exposure.

If unknown (for any potentially "unacceptable" exposure) - continue and enter "IN" status code

Rationale and Reference(s):

⁴ If there is any question on whether the identified exposures are "significant" (i.e., potentially "unacceptable") consult a human health Risk Assessment specialist with appropriate education, training and experience.

6. Check the appropriate RCRIS status codes for the Current Human Exposures Under Control EI event code (CA725), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (and attach appropriate supporting documentation as well as a map of the facility):

 X
 YE – Yes, "Current Human Exposures Under Control" has been verified. Based on a review of the Information contained in this EI Determination, "Current Human Exposures" are expected to be "Under Control" at the Kimberly-Clark PA, LLC facility, EPA ID # PAD002274991

 located at
 Front Street & Avenue of the States, Chester, PA 19013

 under current and reasonably expected conditions. This determination will be re-evaluated when the Agency/State becomes aware of significant changes at the facility.

NO - "Current Human Exposures" are NOT "Under Control."

IN - More information is needed to make a determination.

Completed I	by (signature)	lo w	Date 9/19/2017
	(print)	Catheryn Blankenbiller	
	(title)	RPM	
Supervisor	(signature)	Pullette	Date 9/19/2017 9-22-17
	(print)	Paul Gotthold	
	(title)	Associate Director	
	(EPA Region or	State) EPA Region 3	
Locations w	here References r	nay be found:	
USEPA Reg	gion III	PADEP	
	Chemical Mgmt. I		
1650 Arch S		2 E. Main Street	
Philadelphia	a, PA 19103	Norristown, PA 19401	
127 12		1	

Contact telephone and e-mail nu	mbers
(signature)	
(print)	
(title)	

FINAL NOTE: THE HUMAN EXPOSURES EI IS A QUALITATIVE SCREENING OF EXPOSURES AND THE DETERMINATIONS WITHIN THIS DOCUMENT SHOULD NOT BE USED AS THE SOLE BASIS FOR RESTRICTING THE SCOPE OF MORE DETAILED (E.G., SITE-SPECIFIC) ASSESSMENTS OF RISK.