

**DECISION DOCUMENTATION PACKAGE
COVER SHEET**

prepared in accordance with

**TRACK 1 SITES:
GUIDANCE FOR ASSESSING
LOW PROBABILITY HAZARD SITES
AT THE INEL**

Site description: Abandoned Buried Acid Line from TRA-631 to TRA-671

Site ID: TRA-59

Operable Unit: 2-14

Waste Area Group: 2

I. SUMMARY - Physical description of the site:

TRA-59 is an abandoned buried acid line, consisting of approximately 305 m (1,000 ft) of 7.62-cm (3-in.) carbon steel piping. The pipe is buried approximately 3 m (10 ft) below the ground surface. This line, installed during Advanced Test Reactor (ATR) construction in 1962 to 1963, was used to transfer sulfuric acid from the bulk acid tanks in the Acid and Caustic Pump House (TRA-631) to the ATR Secondary Pump House (TRA-671) for addition to systems associated with ATR. The industrial grade sulfuric acid supplied was suspected to have mercury contamination, making it a potential hazardous waste due to the toxicity characteristic (D009). The acid line has not been used since 1992.

In 1996, the acid transfer line was evacuated with pressurized air from TRA-671 to the Brine Pit after the TRA-671-M-7 acid tank was removed, in accordance with Maintenance Work Order AX515. The Brine Pit contents were then transferred to TRA-708C. The acid transfer line in TRA-671 was cut off, sealed at floor level, and covered with concrete. The acid transfer line in TRA-631 was disconnected and flanged shut. There are no branch connections between the two end points.

Although TRA-59 was evacuated with air, it may still contain an unknown concentration of condensate-diluted sulfuric acid. If there is acid in the pipes (unlikely), it would represent a corrosive environment. Theoretically, the acid is capable of corroding the pipe wall. Corrosion of the pipe wall could occur at a rate of 0.00832 cm (0.0033 in.) per year.⁹ For a pipe with a wall thickness of 0.953 cm (0.375 in.), it could take 113.6 years to corrode through the pipe.

No documented release from this line has occurred, there is no anecdotal information indicating that a release has occurred, so it is not suspected that the TRA-59 pipeline has leaked. In addition, there is no evidence of corrosion.

DECISION RECOMMENDATION

II. SUMMARY – Qualitative Assessment of Risk:

Although a source has been identified and exists at this site, there is no exposure pathway for human or ecological exposure. The source is a buried pipeline that is not suspected to have leaked, and the pipe is believed to be intact.

The level of reliability of the information collected is high, and the qualitative assessment of risk is low. The data were collected and confirmed following documented procedures and no conflicting information is apparent. Therefore, when this information is plotted on the Qualitative Risk and Reliability Evaluation Table an intersection in the “no action” portion of the chart is reached.

III. SUMMARY – Consequences of Error:

False Negative Error. The false negative decision error would be to conclude that there has not been a release from the sulfuric acid line into the soil at TRA-59, when in fact there has. If no further action is taken and an undetected release has occurred at the site, there may be the potential for migration via the groundwater pathway resulting in higher risk than anticipated.

In the worst case scenario, if the pipe was full of concentrated sulfuric acid, then the maximum quantity of sulfuric acid that could be released to the environment is 1,391 L (367.4 gal). However, data collected demonstrates that the sulfuric acid was removed, and the line was evacuated with air in 1996. Since the acid line was evacuated with air, it is assumed that the maximum quantity of sulfuric acid contained within the pipe is 10% of the total volume, which is 139.1 L (36.7 gal). There is no evidence of corrosion in the TRA-59 pipe. In addition, there is no documented release from this line.

False Positive Error. The false positive error would be to conclude there has been a release from the sulfuric acid line into the soil at TRA-59, when in fact there has not. If action were taken at a clean site, this would result in the unnecessary expenditure of resources.

IV. SUMMARY - Other Decision Drivers:

While there may be a risk from leaving the pipeline in the ground, if the pipeline and contents were excavated and removed now, the risk of exposure potential would be increased due to the surrounding facilities, utilities, and other buried lines in the vicinity. Consequently, the risk would be greater by excavating and removing the pipeline now compared to leaving the pipeline in the ground until the entire area can be deactivated.

The source of material is contained in a pipeline that is considered to be intact. The pipeline is 3 m (10 ft) below grade and currently is controlled by TRA operations.

Recommended action:

No further action should be conducted at the buried sulfuric acid line at TRA-59, and it should be reevaluated under a record of decision. TRA-59 should remain under industrial institutional controls until such time that the site and collocated lines can be deactivated, and the risk further evaluated. When this area is deactivated, safety measures will be in place to handle the removal of the materials and the surrounding obstacles. It is estimated that the time required for the pipeline to corrode to a point where the line would be breached is in excess of 100 years. Since the line has been evacuated previously, a

pressure test could easily be performed on the pipeline to prove the integrity of the line.

Signatures	# PAGES:	DATE:
Prepared By:	DOE WAG Manager:	
Approved By:	Independent Review:	

**DECISION STATEMENT
(by DOE RPM)**

Date recd: *February 24, 2003*

Disposition: *TRA-59 is an abandoned 3-inch carbon steel line, approximately 1000 ft in length and buried 10-feet below grade. The line was flushed in 1996 and cut and capped. While residue may remain in the line the risk to humans or the environment is low. No Action should be taken. Institutional Control should include maintaining the location of the pipe for D&D consideration. The TRA-59 site is designated as No Further Action*

DATE: *February 26, 2003*

PAGES (decision statement): *1*

NAME: *Kathleen Hair*

SIGNATURE: *Kathleen S Hair*

DECISION STATEMENT
(by EPA RPM)

TRA-59

Date recd: 9/17/02

Disposition:

Abandoned product caustic line ~ 10ft bgs. line last used in 1992 and may contain residual sulfuric acid. No evidence of release. Potential estimated volume of acid liquid in the pipe is ~ 370 gal. or less. As no additional RODs are planned for WAG 2, it may be appropriate to move this site into 10-08 RI/FS process. Given the depth below grade and the industrial use of the area and the 1996 line evacuation, it does not appear that further investigations are warranted under the FFA/CO. It is unclear if the line qualifies as a HWM storage unit.

DATE: 9/26/02

PAGES: 1

NAME: Wayne Pierre

SIGNATURE: 

**DECISION STATEMENT
(by STATE RPM)**

Date recd: 10/01/02

Disposition:

TRA-59 is an abandoned 3-inch carbon steel line, approximately 1000 feet in length and 10 feet bgs. The line was installed in 1962-63, and transported sulfuric acid from the bulk acid tanks in the Acid and Caustic Pump house (TRA-631) to the ATR Secondary Pump House (TRA-671). The line has not been used since 1996.

In 1996, the line was evacuated with pressurized air. The contents of the pipe were captured and transported to TRA-708c. The line in TRA-671 was cut off and sealed. The other end in TRA-631 was disconnected and flanged shut. Therefore, conservative estimates provided in this Track 1 evaluation of the sulfuric acid and mercury remaining in the line is very unlikely considering the evacuation of the line contents.

The IDEQ concurs with a No Further Action designation for this site. The line can remain under ICs until reevaluated (possibly under the 10-08 RI/FS) and the site and collocated lines can be deactivated, and risk further evaluated.

DATE: November 19, 2002

PAGES: 1

NAME: Daryl L. Koch

SIGNATURE: Daryl L. Koch

Error! Bookmark not defined. PROCESS/WASTE WORKSHEET

SITE ID TRA-59

Col 1 Processes Associated with this Site	Col 2 Waste Description & Handling Procedures	Col 3 Description & Location of any Artifacts/Structures/Disposal Areas Associated with this Waste or Process
Historical processes associated with this site were the routing of sulfuric acid from TRA-631 to TRA-671. One abandoned sulfuric acid line is still located beneath the ground surface.	The pipeline has been evacuated with air, but previously contained industrial grade sulfuric acid, contaminated with mercury.	Artifact: Pipeline Location: Extends from TRA-631 to TRA-671 Description: The pipeline is a 7.62-cm (3-in.) carbon steel acid line, and is currently approximately 305 m (1,000 ft) in length.

CONTAMINANT WORKSHEET

SITE ID Sulfuric Acid Line (TRA-59)

PROCESS (Col 1) The routing of sulfuric acid from TRA-631 to TRA-671

WASTE (Col 2) Industrial Grade Sulfuric Acid, Contaminated with Mercury

Col 4 What Known/Potential Hazardous Substances/ Constituents are Associated with this Waste or Process?	Col 5 Potential Sources Associated with this Hazardous Material	Col 6 Known/Estimated Concentration of Hazardous Substances/ Constituents	Col 7 Risk-based Concentration (mg/kg)	Col 8 Qualitative Risk Assessment (hi/med/lo)	Col 9 Overall Reliability (hi/med/lo)
Sulfuric Acid*	Contained within the pipe	~98% (Reagent-Grade)	N/A	Low	High
Mercury	Contained within the pipe	3.61 mg/kg**	82 mg/kg*** – residential soil ingestion 610 mg/kg*** – industrial soil ingestion	Low	High

*There is a risk of burns from dermal exposure. However, dermal exposure may only have the potential to occur during excavation of this pipe. This risk would be alleviated by the safety measures put in place. No toxicity information (i.e., carcinogenic and noncarcinogenic effects) is available for sulfuric acid in the Integrated Risk Information System (IRIS).

**134 ppm (mg/L) = 3.61 mg/kg (based upon a hypothetical release of one pipe volume of sulfuric acid containing 18.6 g of mercury into 2.78 m³ (98 ft³) of soil)

*** = PRG (EPA Region 9)

QUALITATIVE RISK AND RELIABILITY EVALUATION TABLE			
	QUALITATIVE RISK		
	Low	Medium	High
highly unreliable	TRACK 2		
highly reliable	No Action Required	RI/FS	Interim Action
reliability	LOW Concentration resulting in risk < 10 ⁻⁶	MEDIUM	HIGH concentration resulting in risk > 10 ⁻⁴
	Qualitative risk		

■ Risk from Sulfuric Acid Line

■ NOTE: Industrial institutional controls will be required until the site is deactivated and the risk evaluated.

PROCESS Abandoned Pipeline

Question 1. What are the waste generation process locations and dates of operation associated with this site?

Block 1 Answer:

There are no waste generation processes associated with this site. The TRA-59 pipeline was a sulfuric acid transfer line that was installed in 1962–63, but has not been used since 1992.

Block 2 How reliable are the information sources? XHigh Med Low (check one)

Explain the reasoning behind this evaluation.

The information regarding the function and dates of operation of the sulfuric acid transfer line is well documented, and is considered highly reliable. The New Site Identification Form (NSID)⁷ identifies the time frame that the sulfuric acid transfer line was in service. In addition, a maintenance work order⁵ confirms the information given in the NSID.

Block 3 Has this INFORMATION been confirmed? XYes No (check one)

If so, describe the confirmation.

The information regarding the use and dates of operation of the sulfuric acid transfer line is well documented, and is considered highly reliable.

Block 4 **Sources of Information** (check appropriate box[es] & source number from reference list)

No available information	<input type="checkbox"/>	Analytical data	<input type="checkbox"/>
Anecdotal	<input type="checkbox"/>	Documentation about data	<input type="checkbox"/>
Historical process data	<input type="checkbox"/>	Disposal data	<input type="checkbox"/>
Current process data	<input type="checkbox"/>	QA data	<input type="checkbox"/>
Areal photographs	<input type="checkbox"/>	Safety analysis report	<input type="checkbox"/>
Engineering/site drawings	<input type="checkbox"/>	D&D report	<input type="checkbox"/>
Unusual Occurrence Report	<input type="checkbox"/>	Initial assessment	<input checked="" type="checkbox"/> <u>7</u>
Summary documents	<input type="checkbox"/>	Well data	<input type="checkbox"/>
Facility SOPs	<input type="checkbox"/>	Construction data	<input type="checkbox"/>
OTHER	<input checked="" type="checkbox"/> <u>5</u>		

PROCESS Abandoned Pipeline

Question 2. What are the disposal process locations and dates of operation associated with this site?

Block 1 Answer:

There are no disposal processes associated with this site. The former sulfuric acid transfer line was never used for disposal.

Block 2 How reliable are the information sources? High Med Low (check one)

Explain the reasoning behind this evaluation.

The information regarding the function of the sulfuric acid transfer line is well documented, and is considered highly reliable. The NSID⁷ describes the function of the sulfuric acid transfer line. In addition, a maintenance work order⁵ confirms the information given in the NSID.

Block 3 Has this INFORMATION been confirmed? Yes No (check one)

If so, describe the confirmation.

The information regarding the use of the sulfuric acid transfer line is well documented, and is considered highly reliable.

Block 4 **Sources of Information** (check appropriate box[es] & source number from reference list)

No available information	<input type="checkbox"/>	Analytical data	<input type="checkbox"/>
Anecdotal	<input type="checkbox"/>	Documentation about data	<input type="checkbox"/>
Historical process data	<input type="checkbox"/>	Disposal data	<input type="checkbox"/>
Current process data	<input type="checkbox"/>	QA data	<input type="checkbox"/>
Areal photographs	<input type="checkbox"/>	Safety analysis report	<input type="checkbox"/>
Engineering/site drawings	<input type="checkbox"/>	D&D report	<input type="checkbox"/>
Unusual Occurrence Report	<input type="checkbox"/>	Initial assessment	<input checked="" type="checkbox"/> <u>7</u>
Summary documents	<input type="checkbox"/>	Well data	<input type="checkbox"/>
Facility SOPs	<input type="checkbox"/>	Construction data	<input type="checkbox"/>
OTHER	<input checked="" type="checkbox"/> <u>5</u>		

PROCESS Abandoned Pipeline

Question 3. Is there empirical, circumstantial, or other evidence of migration? If so, what is it?

Block 1 Answer:

There is no evidence of migration. In 1996, the acid transfer line was evacuated with pressurized air from TRA-671 to the Brine Pit. The Brine Pit contents were then transferred to TRA-708C. Each end of the sulfuric acid transfer line was capped.

There is no documented release from this pipeline, and no anecdotal evidence that there was ever a release from this line. In addition, it is not suspected that this line has leaked. However, the issues associated with the pipeline are

- The pipeline is carbon steel.
- Although the line was evacuated with air in 1996, an undetermined quantity of sulfuric acid and condensate may still remain in the abandoned pipe.
- The pipeline was pressurized while in use.
- The corrosion rate of sulfuric acid on carbon steel is 0.00832 cm (0.0033 in.) per year;⁹ assuming that the pipe wall thickness is 0.953 cm (3/8 in.) throughout the length of the pipe, the pipeline could be expected to fail due to corrosion in 113.6 years.
- The entire pipeline was not inspected. Therefore, decisions regarding the integrity of the pipeline are not conclusive.

Block 2 How reliable are the information sources? High Med Low (check one)

Explain the reasoning behind this evaluation.

There are no records available that document any spills or leaks associated with this line. The NSID⁷ summarizes the actions taken regarding the sulfuric acid transfer line. In addition, a maintenance work order⁵ confirms the information given in the NSID. During a D&D project related to TRA-56, described in the 1997 Engineering Test Reactor Secondary Coolant Pumphouse (TRA-645) and Cooling Tower Basin (TRA-751) Decommissioning Final Report,⁸ pictures of the sulfuric acid line^{1,2} (in TRA-631) were taken, showing that the end of the pipe has been blind flanged. Finally, during a discussion with Mr. George Swaney,⁴ he indicated that there have been no documented releases from this line.

Block 3 Has this INFORMATION been confirmed? Yes No (check one)

If so, describe the confirmation.

There are no records available that document any spills or leaks associated with this line.

Block 4 **Sources of Information** (check appropriate box[es] & source number from reference list)

No available information	<input type="checkbox"/>	Analytical data	<input type="checkbox"/>
Anecdotal	<input type="checkbox"/>	Documentation about data	<input type="checkbox"/>
Historical process data	<input type="checkbox"/>	Disposal data	<input type="checkbox"/>
Current process data	<input type="checkbox"/>	QA data	<input type="checkbox"/>
Areal photographs	<input type="checkbox"/>	Safety analysis report	<input type="checkbox"/>
Engineering/site drawings	<input type="checkbox"/>	D&D report	<input checked="" type="checkbox"/> <u>8</u>
Unusual Occurrence Report	<input type="checkbox"/>	Initial assessment	<input checked="" type="checkbox"/> <u>7</u>
Summary documents	<input type="checkbox"/>	Well data	<input type="checkbox"/>
Facility SOPs	<input type="checkbox"/>	Construction data	<input type="checkbox"/>
OTHER	<input checked="" type="checkbox"/> 1,2,4,5		

PROCESS Abandoned Pipeline

Question 4. Is there evidence that a source exists at this site? If so, list the sources and describe the evidence.

Block 1 Answer:

Yes, there is evidence that a source exists at this site. In 1996, the acid transfer line was evacuated with pressurized air from TRA-671 to the Brine Pit; however, an undetermined quantity of sulfuric acid and condensate may still remain in the pipe. The former sulfuric acid transfer line is still located beneath the ground surface at this site, and constitutes the source.

The pipeline has not been used since 1992, and is capped at both ends.

Block 2 How reliable are the information sources? High Med Low (check one)

Explain the reasoning behind this evaluation.

The information regarding the source at TRA-59 is well documented, and is considered highly reliable. An engineering drawing⁶ documents the presence of the sulfuric acid transfer line at TRA-56. The NSID⁷ describes the sulfuric acid transfer line and establishes that the line was evacuated with air. In addition, a maintenance work order⁵ confirms the information given in the NSID. During a D&D project related to TRA-56, described in the 1997 Engineering Test Reactor Secondary Coolant Pumphouse (TRA-645) and Cooling Tower Basin (TRA-751) Decommissioning Final Report,⁸ pictures of the sulfuric acid line^{1,2} (in TRA-631) were taken, showing that the end of the pipe had been blind flanged.

Block 3 Has this INFORMATION been confirmed? Yes No (check one)

If so, describe the confirmation.

The information regarding the source at TRA-59 (the sulfuric acid transfer line) is well documented, and is considered highly reliable.

Block 4 **Sources of Information** (check appropriate box(es) & source number from reference list)

No available information	<input type="checkbox"/>	Analytical data	<input type="checkbox"/>
Anecdotal	<input type="checkbox"/>	Documentation about data	<input type="checkbox"/>
Historical process data	<input type="checkbox"/>	Disposal data	<input type="checkbox"/>
Current process data	<input type="checkbox"/>	QA data	<input type="checkbox"/>
Areal photographs	<input type="checkbox"/>	Safety analysis report	<input type="checkbox"/>
Engineering/site drawings	<input checked="" type="checkbox"/> <u>6</u>	D&D report	<input checked="" type="checkbox"/> <u>8</u>
Unusual Occurrence Report	<input type="checkbox"/>	Initial assessment	<input checked="" type="checkbox"/> <u>7</u>
Summary documents	<input type="checkbox"/>	Well data	<input type="checkbox"/>
Facility SOPs	<input type="checkbox"/>	Construction data	<input type="checkbox"/>
OTHER	<input checked="" type="checkbox"/> <u>1,2,5</u>		

PROCESS Abandoned Pipeline

Question 5. Does site operating or disposal historical information allow for estimation of the pattern of potential contamination? If the pattern is expected to be a scattering of hot spots, what is the expected minimum size of a significant hot spot?

Block 1 Answer:

There is no estimated pattern of potential contamination because there is no documented release from the sulfuric acid transfer line at TRA-59.

Block 2 How reliable are the information sources? High Med Low (check one)

Explain the reasoning behind this evaluation.

There are no records available that document any spills or leaks associated with this line. The NSID⁷ summarizes the actions taken regarding the sulfuric acid transfer line. In addition, a maintenance work order⁵ confirms the information given in the NSID. Finally, during a discussion with Mr. George Swaney,⁴ he indicated that there have been no documented releases from this line.

Block 3 Has this INFORMATION been confirmed? Yes No (check one)

If so, describe the confirmation.

There are no records available that document any spills or leaks associated with this line.

Block 4 **Sources of Information** (check appropriate box[es] & source number from reference list)

No available information	<input type="checkbox"/>	Analytical data	<input type="checkbox"/>
Anecdotal	<input type="checkbox"/>	Documentation about data	<input type="checkbox"/>
Historical process data	<input type="checkbox"/>	Disposal data	<input type="checkbox"/>
Current process data	<input type="checkbox"/>	QA data	<input type="checkbox"/>
Areal photographs	<input type="checkbox"/>	Safety analysis report	<input type="checkbox"/>
Engineering/site drawings	<input type="checkbox"/>	D&D report	<input type="checkbox"/>
Unusual Occurrence Report	<input type="checkbox"/>	Initial assessment	<input checked="" type="checkbox"/> <u>7</u>
Summary documents	<input type="checkbox"/>	Well data	<input type="checkbox"/>
Facility SOPs	<input type="checkbox"/>	Construction data	<input type="checkbox"/>
OTHER	<input checked="" type="checkbox"/> <u>4.5</u>		

PROCESS Abandoned Pipeline

Question 6. Estimate the length, width, and depth of the contaminated region. What is the known or estimated volume of the source? If this is an estimated volume, explain carefully how the estimate was derived.

Block 1 Answer:

A contaminated region cannot be estimated because there is no documented release from the sulfuric acid transfer line.

The estimated volume of the pipeline is 1,391 L (367.4 gal). The line is approximately 305 m (1,000 ft) of 7.62-cm (3-in.) carbon steel piping, between the Pump House (TRA-631) to the ATR Secondary Pump House (TRA-671). The maximum volume within the pipeline was estimated by

$V = \pi r^2 L$, where

π (π) = 3.14,

r = the radius of the pipe, and

L = the length of the pipe.

Therefore, the maximum volume of the pipe is 1.391 m³ (49.09 ft³). Converting this to liters and gallons (where 1 L = 1.0 x 10⁻³ m³ and 1 gal = 3.786 L), then the volume of the pipe is estimated to be 1,391 L (367.4 gal). This number is very conservative. It is unknown whether the acid has corroded portions of the pipe wall, resulting in a thinner pipe wall, and a larger volume within the pipeline. Therefore, the thickness of the pipe walls was not taken into consideration and subtracted from the pipe diameter prior to the calculation.

Block 2 How reliable are the information sources? High Med Low (check one)

Explain the reasoning behind this evaluation.

There are no records available that document any spills or leaks associated with this line. The NSID⁷ gives the dimensions of the sulfuric acid transfer line. In addition, a maintenance work order⁵ confirms the information given in the NSID. Finally, during a discussion with Mr. George Swaney,⁴ he indicated that there have been no documented releases from this line.

Block 3 Has this INFORMATION been confirmed? Yes No (check one)

If so, describe the confirmation.

There are no records available that document any spills or leaks associated with this line.

Block 4 **Sources of Information** (check appropriate box[es] & source number from reference list)

No available information	<input type="checkbox"/>	Analytical data	<input type="checkbox"/>
Anecdotal	<input type="checkbox"/>	Documentation about data	<input type="checkbox"/>
Historical process data	<input type="checkbox"/>	Disposal data	<input type="checkbox"/>
Current process data	<input type="checkbox"/>	QA data	<input type="checkbox"/>
Areal photographs	<input type="checkbox"/>	Safety analysis report	<input type="checkbox"/>
Engineering/site drawings	<input type="checkbox"/>	D&D report	<input type="checkbox"/>
Unusual Occurrence Report	<input type="checkbox"/>	Initial assessment	<input checked="" type="checkbox"/> 7
Summary documents	<input type="checkbox"/>	Well data	<input type="checkbox"/>
Facility SOPs	<input type="checkbox"/>	Construction data	<input type="checkbox"/>
OTHER	<input checked="" type="checkbox"/> 4.5		

PROCESS Abandoned Pipeline

Question 7. What is the known or estimated quantity of hazardous substance/constituent at this source? If the quantity is an estimate, explain carefully how the estimate was derived.

Block 1 Answer:

In 1996, the acid transfer line was evacuated with pressurized air, and it is assumed that the maximum quantity of sulfuric acid contained within the pipe is 10% of the total volume, which is 139.1 L (36.7 gal). However, the estimated maximum quantity of hazardous substance/constituent at this site would be the total amount of sulfuric acid that could be contained within the sulfuric acid line, which is 1,391 L (367.4 gal). The sulfuric acid may be contaminated with mercury at levels of 134 ppm, based upon a sample from another line that originated from the same sulfuric acid tanks at TRA-631.⁸

The line is approximately 305 m (1,000 ft) of 7.62-cm (3-in.) carbon steel piping, between the Pump House (TRA-631) to the ATR Secondary Pump House (TRA-671). The line was evacuated with air in 1996, and it is highly unlikely that anything except a small amount of condensate remains in the line.

The maximum amount of hazardous substance/constituent that could be contained within the sulfuric acid transfer line was estimated by

$V = \pi r^2 L$, where:

π = 3.14,

r = the radius of the pipe, and

L = the length of the pipe.

Therefore, the maximum volume of sulfuric acid that could be contained within the pipe is 1.391 m³ (49.09 ft³). Converting this to liters and gallons (where 1 L = 1.0 x 10⁻³ m³ and 1 gal = 3.786 L), then the maximum volume of sulfuric acid that could be contained within the pipe is estimated to be 1,391 L (367.4 gal). However, since the acid line was evacuated with air in 1996, it is assumed that the maximum quantity of sulfuric acid contained within the pipe is 10% of the total volume, which is 139.1 L (36.7 gal). The detected concentration of mercury in the sulfuric acid (same commercial vendor as TRA-56) is 134 ppm or 134 mg Hg/L of H₂SO₄ (aq). Therefore, if the mercury is homogeneous through the sulfuric acid, and hypothesizing that the pipe is 10% full of sulfuric acid, then the estimated quantity of mercury in the pipe is 18,639.4 mg Hg or 18.6 g Hg. The suspected source of mercury is the commercial grade sulfuric acid used in the demineralization plant.

Block 2 How reliable are the information sources? High Med Low (check one)

Explain the reasoning behind this evaluation.

The information regarding the sulfuric acid transfer line is well documented, and is considered highly reliable. The NSID⁷ specifies the content of the sulfuric acid transfer line, including the concentration of sulfuric acid and the presence of mercury, and defines the length of the acid line. The maintenance work order⁵ confirms the information given in the NSID, and confirms that the line was evacuated with air. During a D&D project related to TRA-56, as described in the 1997 Engineering Test Reactor Secondary Coolant Pumphouse (TRA-645) and Cooling Tower Basin (TRA-751) Decommissioning Final Report,⁸ samples of the sulfuric acid within the line were taken. The mercury analytical data are contained within the TRA-56 D&D report.

Block 3 Has this INFORMATION been confirmed? Yes No (check one)

If so, describe the confirmation.

The information regarding the sulfuric acid transfer line is well documented, and is considered highly reliable.

Block 4 **Sources of Information** (check appropriate box[es] & source number from reference list)

No available information	<input type="checkbox"/>	Analytical data	<input type="checkbox"/>
Anecdotal	<input type="checkbox"/>	Documentation about data	<input type="checkbox"/>
Historical process data	<input type="checkbox"/>	Disposal data	<input type="checkbox"/>
Current process data	<input type="checkbox"/>	QA data	<input type="checkbox"/>
Areal photographs	<input type="checkbox"/>	Safety analysis report	<input type="checkbox"/>
Engineering/site drawings	<input type="checkbox"/>	D&D report	<input checked="" type="checkbox"/> <u>8</u>
Unusual Occurrence Report	<input type="checkbox"/>	Initial assessment	<input checked="" type="checkbox"/> <u>7</u>
Summary documents	<input type="checkbox"/>	Well data	<input type="checkbox"/>
Facility SOPs	<input type="checkbox"/>	Construction data	<input type="checkbox"/>
OTHER	<input checked="" type="checkbox"/> <u>5</u>		

PROCESS Abandoned Pipeline

Question 8. Is there evidence that this hazardous substance/constituent is present at the source as it exists today? If so, describe the evidence.

Block 1 Answer:

Yes, there is evidence that the hazardous substance/constituent is present at the source as it exists today. The former sulfuric acid transfer line is still located beneath the ground surface at this site. Although the line was evacuated with air in 1996, it may still contain an unknown concentration of condensate diluted sulfuric acid. However, no documented release from this line has occurred, the ends of the line are capped, and there is no evidence of corrosion.

Block 2 How reliable are the information sources? High Med Low (check one)

Explain the reasoning behind this evaluation.

There are no records available that document any spills or leaks associated with this line. The NSID⁷ identifies the time frame that the sulfuric acid transfer line was in service, and summarizes the actions taken regarding the sulfuric acid transfer line. The maintenance work order⁵ confirms the information given in the NSID, and confirms that the line was evacuated with pressurized air. During a D&D project related to TRA-56, as described in the 1997 Engineering Test Reactor Secondary Coolant Pumphouse (TRA-645) and Cooling Tower Basin (TRA-751) Decommissioning Final Report,⁸ pictures of the sulfuric acid transfer line^{1,2} (in TRA-631) were taken showing that the end had been capped.

Block 3 Has this INFORMATION been confirmed? Yes No (check one)

If so, describe the confirmation.

The information regarding the sulfuric acid transfer line is well documented, and is considered highly reliable.

Block 4 **Sources of Information** (check appropriate box[es] & source number from reference list)

No available information	<input type="checkbox"/>	Analytical data	<input type="checkbox"/>
Anecdotal	<input type="checkbox"/>	Documentation about data	<input type="checkbox"/>
Historical process data	<input type="checkbox"/>	Disposal data	<input type="checkbox"/>
Current process data	<input type="checkbox"/>	QA data	<input type="checkbox"/>
Areal photographs	<input type="checkbox"/>	Safety analysis report	<input type="checkbox"/>
Engineering/site drawings	<input type="checkbox"/>	D&D report	<input checked="" type="checkbox"/> 8
Unusual Occurrence Report	<input type="checkbox"/>	Initial assessment	<input checked="" type="checkbox"/> 7
Summary documents	<input type="checkbox"/>	Well data	<input type="checkbox"/>
Facility SOPs	<input type="checkbox"/>	Construction data	<input type="checkbox"/>
OTHER	<input checked="" type="checkbox"/> 1,2,5		

References for Decision Documentation Package

1. G. Keating, Picture of Disconnected Acid Lines in TRA-631 (TRA-59), C:\Windows\Acidlines.jpg.
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