LEAD Agency's Comments to EPA

Human Health Risk Assessment
For Tar Creek Superfund Site OU-5

Public Comments due August 17, 2020.
Email your comments to jcoates@epa.gov.

Public input is essential to protecting our health. Your comments to EPA are needed.

Terms and definitions follow:

**Operable Unit 5 (OU-5)** is defined as sediments and surface water between the stream banks in perennially flowing creeks, streams, and rivers that may be impacted by historical mining activities. This includes sediment, surface water, and aquatic plants and animals.

**Human Health Risk Assessment (HHRA)** evaluates human health risks associated with potential exposure to the contamination in OU-5 identified by the RI.

**Remedial Investigation (RI)** describes of the nature and extent of contamination associated with Operable Unit 5 (OU5)

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Why is the HHRA for OU-5 so important? Why does EPA need to hear from me now?

**After** the HHRA, EPA will develop a cleanup plan for OU-5. The cleanup plan can only address risks identified in the HHRA. If the public doesn’t comment about the problems with this HHRA, we’ll all be stuck with a cleanup plan that doesn’t address all the risks we face.

Why should comments for the HHRA talk about the Remedial Investigation (RI)?

Evaluating human health risks (HHRA) won’t work unless EPA first acknowledges all the contaminants that exist (RI). When the RI ignores contaminants that exist within OU-5, then the HHRA can’t possibly evaluate all the human health risks present within OU-5.
Summary of LEAD Agency's Comments to EPA
Human Health Risk Assessment for Tar Creek Superfund Site OU-5

1. LEAD Agency believes that the RI does not reflect all the contamination found within OU-5. EPA has largely ignored comments from, and data collected by, tribal stakeholders and LEAD Agency during the Remedial Investigation process.

2. EPA has failed to consider the contaminated Boone Aquifer as a source of potential human health exposure in the HHRA.

3. EPA has failed to consider the watersheds’ historical floodplains as a source of potential human health exposure.

4. EPA’s decision to ignore numerous contamination sources within OU-5 has led to an HHRA that is un-usable as a tool for protecting human health or developing an effective cleanup plan.

5. EPA’s decision to draw a vast boundary for OU-5 artificially dilutes the nature and extent of contamination currently damaging ecological health, ecological health, and tribal cultures.

6. This HHRA reflects a decades-long pattern by EPA of putting off to some indefinite “later” human health risks that cut across OU boundaries. It is time for EPA to acknowledge and remedy these systemic flaws by reassessing its conceptual site model and creating new site-wide OUs to directly address the most pernicious and persistent risks to human and environmental health.

7. The HHRA should be held in abeyance until the EPA reassesses all Tar Creek OU’s and creates such additional OU’s as are necessary to address sitewide human and environmental health hazards consistently excluded from treatment within individual OU’s. Only after this reassessment should the EPA re-do the RI and HHRA for OU-5.

8. As part of its sitewide review, the EPA should create a new Operable Unit that includes Grand Lake and incorporate Grand Lake contamination in the OU5 RI and HHRA
August 3, 2020

Janetta Coats
EPA Community Involvement Coordinator
coats.janetta@epa.gov

Dear Ms. Coats:

Tar Creek Superfund Site OU-5 HHRA- Review Comments

The following review comments address Version 1.1 of the Human Health Risk Assessment (HHRA) for Tar Creek Superfund Site, Operable Unit 5 dated May 2020. These comments are provided by the Local Environmental Action Demanded (LEAD) Agency, Inc. LEAD is a non-profit 501(c)(3) Environmental Justice organization, incorporated in 1997 to investigate and inform our community about potential environmental public health hazards from the Tar Creek Superfund Site and other environmental issues facing our community.

Our review comments are divided into three categories: 1. Narrative Discussion Comments; followed by 2. Critical General Comments; and 3. Detailed Document Review Comments. All three categories of our comments should be addressed by EPA and its contractor before the HHRA document is approved. Overall, the approach to development of the document, and this phase of the Tar Creek Superfund project appears greatly flawed and warrants a thorough reassessment.

Narrative Discussion Comments

1. EPA has largely ignored comments from, and data collected by, tribal stakeholders and LEAD Agency throughout the Remedial Investigation for OU-5 Final Report.

The EPA has been funding the tribal governments since the late 1990s for management and operations of their environmental programs. These programs include monthly water monitoring for basic parameters such as PH, dissolved oxygen, dissolved solids, nitrogen, temperature, etc., as well as sediment studies, plant studies (metals contamination), food consumption surveys, air quality, well water sampling, and other environmental programs for which data has been produced. The EPA has stored this data for two decades. In addition to tribal data EPA routinely stores, the tribes have utilized consultants such as Tribal Environmental Management Services and Harvard School of Public Health to characterize the nature and extent of contaminant uptake of plants in riparian areas and floodplains in the watersheds of this HHRA. Further, LEAD Agency and the Tribes have contributed their findings of surveys of their populations regarding fish consumption (rates and style of consumption and cooking preferences). Finally, LEAD, in Partnership with
Harvard School of Public Health, has conducted investigations of water and sediment contamination of the Tar Creek and Neosho River watersheds, and fish consumption studies in all the watersheds.

In each of these instances, Tribes, the LEAD Agency, and other researchers have shared results and data with the EPA.

The LEAD Agency understands that most or all the aforementioned stakeholder-generated data collection efforts were perhaps referenced in the Remedial Investigation (RI), and yet never validly considered to be incorporated into the RI/HHRA effort.

2. EPA has failed to consider groundwater (Boone Aquifer) as a media of potential human health exposure. Such an omission is clearly inconsistent with the development of a valid human health risk assessment.

We understand that EPA defined groundwater as a completely different Operable Unit and that EPA specifically established OU-1 (decades ago) as representative of surface water degradation of Tar Creek from Acid Mine Water (AMW) and the threat of groundwater contamination migrating to and from the Roubidoux aquifer. While there were notable successes addressing OU-1, we believe that most of the efforts EPA completed to date in OU-1 should be considered an emergency Superfund action rather than a complete resolution of groundwater contamination. Given the ongoing sources of highly contaminated surface water and groundwater that remain today, the Record of Decision for OU-1 was woefully inadequate and certainly premature. The inadequacy of the OU-1 effort carried over into the misguided exclusion of groundwater exposure in this HHRA. It is illogical to develop a HHRA for OU-5 while well-documented ongoing surface water and groundwater contamination continues unabated.

Nearly 30 years into this Superfund effort, EPA and the Oklahoma Dept. of Environmental Quality (ODEQ) still regularly state that Boone Aquifer, a shallow aquifer covering all of Ottawa County, is highly contaminated and should not be used domestically unless specific sentinel monitoring wells test safe. In fact, all wells should test safe. Our groundwater is an essential resource needed for tribes and local citizens to survive and flourish. Aquifer recharge and discharge areas occur in many county locations (areas of Spring River, for example) and these hydrologic connections can be (and surely remain) a continuing source for discharge of COCs into our watershed.

The HHRA is even unclear in addressing whether or not existing residents may be drinking or otherwise using contaminated private well water. What is clear is that the Boone Aquifer is still a drinking water source for some rural residents in the area.
3. EPA has failed to consider the watersheds’ historical floodplains as a media (pathway) of potential human health exposure. Such an omission is clearly inconsistent with the development of a valid human health risk assessment.

The major watersheds of the Tar Creek Superfund Site are subject to regular patterns of historical flooding. The floodplain areas are extensive and cover land areas well outside the bounds of the typical dry weather waterways. The floodplain areas include residential, recreational, commercial, wetland, and farmland areas. Presently, many well-documented floodplain areas are contaminated with mining waste. The mining waste was conveyed during recurring flooding events by surface water, groundwater, and surface mining waste sources (tailing ponds and chat piles) over many, many decades. These extensive deposits of contaminated waste in floodplain areas have become ongoing sources of contamination that continue to adversely impact (i.e., contaminate) groundwater and surface water. Given the ongoing and historical contaminant run-off from impacted riparian and floodplain areas as flooding recedes, it is imperative that these media, groundwater and soils, be included in HHRA. During the RI comment period, Stakeholders specifically asked EPA to include groundwater and soils. EPA ignored the Stakeholders’ requests.

For many years, LEAD and the Tribes have cooperated with EPA in gathering data and helping to fill-in data gaps as requested by EPA. We have counted on EPA to take the right plan of action, to manage the project in a way calculated to yield a positive outcome for Area Stakeholders. We could never have anticipated our present disappointment in this HHRA and the companion Remedial Investigation.

We are confounded and troubled by EPA’s disregard for first principles in this instance. No meaningful human health risk assessment can be completed without considering ALL the data regarding ALL the media involved within the watersheds of the Tar Creek Superfund Site. Stakeholders raised these concerns in comments on the RI, and EPA ignored most of these comments. Now EPA asks us to comment on an HHRA based on an incomplete evaluation, flawed in many regards, and omitting important contaminated environmental media that must be included to properly assess human health risks. LEAD Agency respectfully submits that EPA’s conduct in this matter is not only neglectful, but that it is wrong.

4. EPA’s decision to ignore media essential to any environmental investigation, in addition to a deeply flawed Remedial Investigation, has led to an HHRA so fraught by uncertainties as to render it un-usable as a tool for protecting human health or for site remediation.

EPA used a flawed RI to build a Risk Assessment (HHRA) wrought with baseless assumptions. As a result, the HHRA assumptions in many ways to do not balance with the less than meaningful RI document. Consequently, when flawed assumptions cannot be clearly articulated due to lack of evidence, EPA and its contactor merely broadened the site conditions by moving
more issues to the “Uncertainty” category. Unfortunately, this Uncertainty category is very broad and, along with weak, flawed and questionable assumptions, makes reading and commenting on the document difficult and frustrating. For instance, in the Uncertainty Analysis (Section 6.6), EPA and its contractor make the following statement: “The discussion of [uncertainty] is largely qualitative because, in many instances, not enough information exists to quantify the magnitude of these uncertainties”. Together with the inherent flawed approach taken to complete the OU-5 HHRA, this esoteric gibberish is disappointing and further demonstrates that the document is mainly irrelevant. The document further states in Section 6.6: “While it is theoretically possible that the HHRA leads to underestimates of potential health outcome, the use of numerous upper-bound assumptions most likely results in conservative estimates”. We make the same comment about this continued gibberish. Furthermore, the LEAD Agency asserts that the HHRA is clearly NOT conservative. Having left out three of the most important media of any environmental investigation (groundwater, air & soils), renders the document un-useable from a human health risk analysis, and also un-useable as a definitive guide to both the safe cleanup at the Mining-District and the highly contaminated waterways and floodplain areas.

5. EPA’s decision to draw a vast boundary for OU-5 artificially dilutes the nature and extent of contamination currently damaging ecological health, human health, and Tribal cultures.

The Lead Agency has many concerns about the fundamental definition or boundary of OU-5. The scope of OU-5 is exceedingly large, thus by default diluting the nature and extent of ongoing sources of contamination currently adversely affecting both potential ecological and human health. All Stakeholders and EPA KNOW that mine waste is toxic. Vast reaches of several major waterways are strewn with several feet of mine waste. EPA must address the ubiquitous presence of major sediment, floodplain, surface water, and groundwater waste in ongoing contamination areas. We understand that at many (and perhaps most) Superfund sites, airborne exposure is not significant. At this Superfund site, airborne transmission of contaminants has been and remains a real human health concern.

These unnaturally large boundaries mask not only the severity of the contamination, but the degree of harm this contamination imposes on Tribal practices. Cherished Tribal lands within the Tar Creek Superfund remain gravely damaged and must be repaired for the sake of the Tribes’ continued existence. The HHRA seems designed to create the appearance of a substantial degree of completion of EPA’s work on the Tar Creek Superfund Site. The Lead Agency strongly believes the HHRA inadequately captures the severity and extent of contamination and its damage to Tribal culture.
6. This HHRA reflects a decades-long pattern by EPA of putting off to some indefinite “later” human health risks that cut across OU boundaries. It is time for EPA to acknowledge and remedy these systemic flaws by reassessing its conceptual site model and creating new site-wide OUs to directly address the most pernicious and persistent risks to human and environmental health.

Once again, the LEAD Agency believes that historical RI efforts completed to date for the overall Tar Creek Superfund site were deeply flawed. We believe that not only the HHRA, but the entire RI effort warrants re-assessment as part of the re-evaluation of newly defined site-wide OUs. Our complete review comments on the RI will not be presented herein. However, two examples illustrate the urgency of these concerns.

First, the ongoing presence, movement, and release of contaminated groundwater at the Tar Creek Superfund Site clearly reflects the consequences of a failed RI effort. The complexity of site-wide groundwater, together with mining induced hydrogeologic changes to site-wide fault zones, groundwater flow, aquifer interconnections, recharge and outflow zones, local springs, and other lineament features in heavily mined areas demonstrates that the groundwater situation remains poorly understood. The conceptual site model for site-wide groundwater needs to be revised as part of EPA’s renewed investigative efforts prior to pursuing further renewed HHRA OU tasks.

Second, the HHRA fails to address ongoing human health exposures resulting from COCs that continue to impact residents who remain living in residential areas presently defined by the OU-2 boundary (i.e., residential and high-access areas). Significant human health concerns still exist in the Picher area, one of the most highly contaminated areas of the Tar Creek Superfund site. Residents living in these areas are surrounded by chat piles, mine tailing ponds, acid mine water, and highly contaminated surface streams and stormwater runoff. The residents here are exposed to contaminated food, waterborne contact, drinking water consumption, airborne inhalation of particulates, and land contact scenarios. Many of these residents are quite poor and thus are more likely to rely on subsistence-related food consumption of fish, mollusks, and other water-related organisms. They are more likely to drink contaminated water; they are more likely to ingest mining waste dust; and are more likely to have children in day-to-day contact with mining waste of all kinds.

Some of the individuals and families living in highly contaminated area may not have participated in prior buy-out offers, and some may be non-owners (e.g., leasers, trespassers). Whatever the reason, these residents living in highly contaminated areas (subject to subsidence) remain seriously in harm’s way. Relatedly, workers in Picher including Quapaw Tribal Superfund Workers, Fire & EMT, County Barn, etc. are exposed daily and bring exposures (dust) home to their families.

These are but two examples among many why the Conceptual Exposure Model (and in fact, the entire HHRA itself) is inaccurate at every level.

The HHRA represents an academic exercise far removed from any sense of reality. It ignores potential significant human health risks at the Tar Creek Superfund Site. Both the RI and HHRA
seem designed as little more than a meaningless academic conglomeration of baseline assumptions, using largely irrelevant data, surrounded by an incredibly wide swath of uncertainties. Meanwhile, important existing contaminant data are neglected, the nature and extent of contamination remains undefined, and numerous blatant ongoing contamination sources continue to impact the entire Tar Creek Superfund Site, extending into Grand Lake.

7. In light of these dramatic failures by the HHRA and RI, the LEAD Agency requests the HHRA be held in abeyance until the EPA reassesses all Tar Creek OU’s and creates such additional OU’s as are necessary to address sitewide human and environmental health hazards consistently excluded from treatment/remediation within individual OU’s. Only after this reassessment should the EPA re-do the RI and HHRA for OU-5.

LEAD requests that this HHRA be held in abeyance and not released. Before embarking on revised RI and HHRA efforts, the delineation of all Operable Units must first be reassessed and reestablished to yield meaningful zones of investigation, thus leading to accurate characterization and thence development of effective future remediation actions. After reassessing the Site’s Operable Units, the RI be re-done to include all media: groundwater, air and soils (including floodplain & riparian). The RI should include an expanded list of plant, aquatic and animal species, and should better reflect how these resources are utilized and consumed. Then the area may be characterized further accordingly.

The Tar Creek Superfund site is dynamic, as it is impacted by continual migration and movement of contaminants (even by wind). Thus, analytical data over 4-5 years old should not be included in the calculations for the HHRA. Such data should be considered advisory data only. Before continuing any work on the HHRA, EPA must first complete a new RI with newly defined OU boundaries and new analytical data. A new Draft HHRA can then be produced to accurately reflect site conditions and to accurately assess human health exposure based on valid, meaningful Revised Remedial Investigation efforts.

8. As part of its sitewide review, the EPA should create a new Operable Unit that includes Grand Lake and incorporate Grand Lake contamination in the OU5 RI and HHRA.

LEAD Agency requests that EPA take the common-sense step of defining Grand Lake as a separate Operable Unit. Grand Lake is the ultimate ‘sink’ of COCs from the entire Tar Creek Superfund site. While the contaminants in upper waterways and floodplain zones (e.g., Tar Creek, Beaver Creek, Lytle Creek, Neosho River, etc.) directly impact the LEAD Agency and the Tar Creek Superfund Site Stakeholders, they also have substantial human and ecological health impacts in Grand Lake. The contamination present in Grand Lake results directly from historical and ongoing releases of mining waste from the Tar Creek Superfund Site. We believe there is a huge quantity of mining waste in Grand Lake, that the upper reaches of Grand Lake
contain highly impacted sediment, and that this contaminated sediment is migrating in a continual wave front toward and into the lower reaches of Grand Lake.

Consequently, stakeholders and citizens around Grand Lake have a vested interest in completing a responsible, effective investigation and remediation of the Tar Creek Superfund Site. Thus, future RI efforts should include Grand Lake. If EPA fails to integrate the extensive contamination in Grand Lake into the RI process, it will substantially undercut remediation efforts at the Tar Creek Superfund Site. Further, should EPA continue to ignore contamination at Grand Lake in the RI process, it will utterly fail to meet its obligation to citizens living and recreating in Grand Lake.

9. The EPA should enter into a Memorandum of Understanding with the Federal Energy Regulatory Commission and the Grand River Dam Authority that will integrate remediation of the off-site impacts of the Tar Creek Site/TSMD, as well as remediation of the Lake.

LEAD Agency recommends that EPA and Federal Energy Regulatory Commission (FERC) sign an MOU in conjunction with the re-licensing effort by Grand River Dam Authority (GRDA) for the hydro-dam at Grand Lake that acknowledges the historical and on-going contamination of the Lake AND set up a framework for remediation of the off-site impacts of the Tar Creek Site/TSMD, as well as remediation of the Lake. This not only needs to be part of the Superfund program at the Tar Creek/TSMD, but also formally part of the “plan” within the license framework of a renewed 30-year license for Pensacola Dam.

We request that EPA respond to the Lead Agencies narrative comments above.

With this said, the following are our specific comments on the HHRA document:

**Critical General Comments**

1. **Re-evaluation and Assessment of Tar Creek Superfund Site is Needed Before the HHRA can Proceed:** EPA proposed to list the Tar Creek Superfund site on the NPL list in 1981 and the site was ultimately placed on the NPL list on September 8, 1983. Thus, work has been progressing to investigate and remediate this NPL site for 37 years. While some very beneficial remediation activities have been completed, the lack of progress at achieving a reasonable degree of effective, meaningful remediation over a near 40-year period is quite remarkable. As a result, before the HHRA proceeds any further, EPA should complete a thorough re-assessment of the clean-up activities completed to date. The review comments below provide examples of the information that EPA should address so that EPA and all stakeholders can gauge the current status of the project, the success of remedial efforts completed to date, and the path forward for developing future Superfund activities, including the HHRA.
2. **Delineation of Operable Units:** The Tar Creek Superfund site has been split up into five Operable Units (OUs). The OUs are defined as:

- OU1 - Surface water/Ground Water
- OU2 – Residential Properties
- OU3 – Drum Removal in Cardin (Eagle-Picher Office Complex – Abandoned Mining Chemicals Removal Action)
- OU4 – Chat Piles other Mine and Mill Waste, and Smelter Waste
- OU5 – Sediment and Surface Water

The delineation of OU2 and OU3 made sense. The work to date at OU2 led to effective cleanup of many high access areas and residential properties to reduce imminent risk, and continues into the future. The work at OU3 led to a relatively straightforward, effective removal of 120 drums of laboratory chemicals at the Eagle-Picher Office Complex and cleanup of the grounds.

However, the delineation of OU1, OU4, and OU5 has resulted in extraordinarily large areas in an unwieldly effort to characterize contaminated areas that have vastly different contamination concerns. Briefly, the definition of OU1, OU4, and OU5 perhaps made sense back in the early 80s and 90s. It does not make sense today.

For example, OU 2 presently consists of 2,940 land parcels in 11 separate communities. More HHRA’s have been identified by community members and have yet to be sampled or cleaned or community has not been informed about the additional sites. OU3 was defined to address a removal action. Approximately 1,500 acres of land have been remediaged under OU-4. While the Tar Creek Superfund site is described as having ‘no clearly defined boundaries, the approximate surface area of OU5 is about 437 square miles or about 280,000 acres. YET, under OU2, every residence in the whole of Ottawa County can request yard testing and will be remediated if found to be high in lead. An OU of 3 acres or 50 acres makes sense. An OU encompassing 280,000 acres does not. It is illogical to characterize or otherwise investigate and develop a plan for remedial action for such an extensive OU site boundary.

Because of the extensive land area addressed by OU5, it is inappropriate to do a risk assessment of such an area. It appears to be an exercise of futility. As EPA expands the boundary of an OU, there are specific areas of true concern that become effectively diluted and the outcome of the HHRA loses focus on the main concerns at hand. The damage to the lands of our various Tribal stakeholders becomes misinterpreted.

3. **Chat Pile Inventory:** The status of the chat pile remediation needs clarification. We request that EPA provide a clear inventory of the chat piles. This information should be provided in tabular format that summarizes:
Chat pile designation number, drainage basin, GPS coordinates, Initial Chat Pile area (acres), Initial Volume (CY), Volume Remediated (CY), Volume to be Remediated (CY), Area still to be remediated (acres), and Present status of each pile

4. **Chat Pile Actions to Date:** The work completed to address all chat piles is presently unclear. The area covered in chat piles is a well defined sub-area encompassing roughly 10,000 acres of the 280,000-acre OU5 area. The 10,000 acres is generally centered in the Picher-Cardin-Treece, Oklahoma/Kansas areas, and there are also a limited number of chat piles near Baxter Springs and Galena, Kansas and near Belle Center, Missouri. EPA should provide a narrative summary of the progress to date by outlining the following information regarding the 10,000 acres of highly contaminated chat piles-highly impacted land:

**Number of Chat Piles**

Number initially = 170? Confirm

Number capped in place (engineered cap) = ?

Number removed with material placed in an off-site mine waste repository = ??

Number removed with material placed in a Tar Creek site mine waste repository = ??

Number removed and placed into Tar Creek area mine caverns = ??

Number covered with soil (non-engineered cap) = ??

Number of piles addressed with institutional controls (no remediation) = ??

Number fully remediated = ??

Number of piles remaining to be addressed = ??

**Volume of Chat Piles**

Initial Volume = ?? CY

Volume remediated with an engineered cap in place = ? CY

Volume covered with soil as selected remediation = ? CY

Total volume of chat sold = ?? CY
Above volume includes:
Volume sold for road construction = ? CY
Volume sold for mineral recovery = ?? CY
Volume removed and placed in an off-site mine waste repository = ?? CY
Volume removed and placed in a Tar Creek site mine waste repository = ?? CY
Volume removed and placed into Tar Creek site mine caverns = ?? CY
Volume addressed through institutional controls = ?? CY
Volume remaining to be addressed = ?? CY

**Area of Chat Piles**

Initial total area = ??? Acres
Area remediated with an engineered cap in place = ? Acres
Area covered with soil as selected remediation = ? Acres
Area addressed through institutional controls = ?? Acres
Total Area remaining to be addressed = ?? Acres

5. **Tailing Pond Inventory**: The status of the tailings ponds undergoing remediation needs clarification. We request that EPA provide a clear inventory of the tailings ponds. This information should be provided in tabular format that summarizes:

   - Tailings pond designation number, drainage basin, GPS coordinates, Initial Volume of tailings (CY), Volume Remediated (CY), Volume to be Remediated (CY), Area to be remediated (Acres), and Present status of each pond

6. **Tailings/Flotation Pond Actions to Date**: The work completed to address all of the tailings ponds is presently unclear. EPA should provide a narrative summary of the progress to date by outlining the following information regarding the flotation ponds that represent many acres of highly impacted land:
**Number of Flotation Ponds**

Number initially = ??

Number capped in place (engineered cap) = ?

Number removed with material placed in an off-site mine waste repository = ??

Number removed with material placed in a Tar Creek site mine waste repository = ??

Number removed and placed into Tar Creek area mine caverns = ??

Number covered with soil (non-engineered cap) = ??

Number of ponds addressed with institutional controls (no remediation) = ??

Number of pond sites fully remediated = ??

Number of pond sites remaining to be addressed = ??

**Volume of Tailings Pond Waste**

Initial Volume = ?? CY

Volume remediated with an engineered cap in place = ? CY

Volume covered with soil as selected remediation = ? CY

Total volume of Pond Waste sold = ?? CY

   Above volume includes:
      Volume sold for road construction = ? CY
      Volume sold for mineral recovery = ?? CY

Volume removed and placed in an off-site mine waste repository = ?? CY

Volume removed and placed in a Tar Creek site mine waste repository = ?? CY

Volume removed and placed into Tar Creek site mine caverns = ?? CY

Volume addressed through institutional controls = ?? CY

Volume of Pond waste remaining to be addressed = ?? CY
**Area of Flotation Ponds**

Initial total area = ??? Acres

Area remediated with an engineered cap in place = ? Acres

Area covered with soil as selected remediation = ? Acres

Area addressed through institutional controls = ?? Acres

Total Area remaining to be addressed = ?? Acres

7. **Other Impoundment Pond Inventory:** The status of any other impacted impoundments not classified as a “tailings pond” needs clarification. We request that EPA provide a clear inventory of the other impacted ponds at the Tar Creek Superfund site. This information should be provided in tabular format that summarizes:
   - Impoundment/pond designation number, drainage basin, GPS coordinates, Initial Volume (Gal), Volume Remediated (Gal), Volume to be Remediated (Gal), Area to be remediated (Acres), and Present status of each pond

8. **Other Impoundment Actions to Date:** The work completed to address other impoundments is presently unclear. EPA should provide a narrative summary of the progress to date by outlining the following information regarding the non-tailings impoundments.

   **Number of Other Impoundments**

   Number initially = ??

   Number of ponds addressed with institutional controls (no remediation) = ??

   Number of pond sites fully remediated = ??

   Number of pond sites remaining to be addressed = ??

   **Volume of Other Impoundments**

   Initial Volume = ??? Gallons

   Volume treated and discharged = Gallons

   Volume hauled away = Gallons

   Total Volume remaining to be addressed = ?? Gallons
9. **Mining Cavity Inventory:** The status of mine cavity sites at the Tar Creek Superfund Site needs clarification. Mining cavity areas include mine shafts and underground cavities where subsurface mining occurred. Stakeholders need to know the status of these areas because the impacts from these cavities directly affects the lands of the various Indian Nation stakeholders and communities. These cavities are an ongoing source of groundwater and surface water contamination and the stability of the above land has been compromised. We request that EPA provide a clear inventory of the mining cavities at the Tar Creek Superfund site. This information should be provided in tabular format that summarizes:

- Mine Shaft designation number, drainage basin, GPS coordinates, opening size (length & width), depth (feet), Status of investigation, Future actions planned, locations of any known discharges to surface waters from each mine shaft

- Cavity area designation number, drainage basin, GPS coordinates, Subsurface area (sq ft, length & width), depth to bottom of cavity (feet), depth to top of cavity (feet), status of investigation, Future actions planned, current assessment of land surface stability, locations of any known discharges to surface waters from the cavity, Description of if each cavity is suspected of impacting groundwater.

10. Superfund work at the Tar Creek site has been ongoing for 37 years. What percent of the project work to be done has been completed to date?

11. **Inventory of Dispersed Chat Pile Residue:** There are locations throughout the Tar Creek Superfund site where it appears chat pile residue was used as general fill material at various farm locations. Have such sites been identified, inventoried, and characterized? Examples are presented on the following pages:

(Remainder of page intentionally blank)
This aerial image is dated 9/27/11

Coordinates of above place mark are as follows:
37° 27.12"N
94° 47'18.39"W
This aerial image is dated 9/27/11

Coordinates of above place mark are as follows:
37° 2'11.28"N
94°45'11.01"W
C.

This aerial image is dated 6/15/09

Coordinates of above place mark are as follows:
37° 0'38.58"N
94°49'59.66"W

D.

This aerial image is dated 3/29/15
Coordinates of above place mark are as follows: 36°57'9.17"N, 94°49'40.39"W
E.

This aerial image is dated 3/29/15

Coordinates of above place mark are as follows:
36°56'49.20"N
94°52'23.40"W

12. Areas of Known AMD: We are aware of the successful interceptor treatment system designed to remediate one source of AMD into the Tar Creek. There is another AMD-impacted site about 1000 ft north of the treatment system that appears to bypass the treatment system. There is also a major AMD site about 2-1/2 miles north of the treatment system that remains untreated. This particular AMD site traverses the length of Tar Creek about 8 miles until the confluence of the Neosho River. Please provide an inventory of all known areas of acid mine drainage. Please provide the status of all AMD sites and clarify which ones have been assessed and remediated. Does EPA believe that all active areas of acid mine drainage been delineated?
13. Are the following sites on EPA’s list of AMD sites?

A.

This aerial image is dated 3/29/15

Coordinates of above place mark are as follows:
37° 0'28.73"N
94° 50'13.40"W
This aerial image is dated 6/15/09

Coordinates of above place mark are as follows:

36°57'25.51"N
94°50'39.04"W
C.

This aerial image is dated 6/15/09

Coordinates of above place mark are as follows:
36°57'4.71"N
94°50'46.21"W

14. **Inventory of Chat Pile Residue Downgradient of Chat Piles:** There are locations throughout the Tar Creek Superfund site where it appears chat pile residue migrated downstream of existing or former chat piles. Have these areas of significant chat pile material been identified, inventoried and characterized? Have such sites been inventoried? Example are presented below:
This aerial image is dated 3/29/15

Coordinates of above place mark are as follows:

36°59'9.99"N
94°50'47.29"W
B. This aerial image is dated 3/29/15

Coordinates of above place mark are as follows:

36°58'12.95"N
94°51'4.33"W

15. **Include all media**- The HHRA should be revised to include all appropriate media in its calculations and results. The HHRA should give complete rationale for not including groundwater, air and soils if appropriate. The HHRA should include that the nature and extent of contamination has been defined in all media to the extent to which those contaminants have come to reside.

In general, the Superfund process followed to date has followed a typical Superfund administrative protocol (with the exception of conducting environmental investigations that ignore important media). However, the Tar Creek Superfund site is NOT typical. A site of this magnitude warrants a site-specific delineation of OUs that correspond to the special circumstances present at the Tar Creek Superfund site.
Detailed Document Review Comments

1. **Page ES-1, Exposure Scenarios Evaluated, Fourth Bullet:** The bullet states, “Aquatic biota (fish, shellfish, aquatic plants, amphibians/aquatic reptiles, and semi-aquatic mammals). Food consumption (ingestion) as part of tribal lifeway activities, food consumption (ingestion - fish only) by the general public, and medicinal use (dermal - aquatic plants only) as part of tribal lifeway activities.”

   Please clarify why only fish have been considered for ingestion and aquatic plants for dermal use only. Please clarify if there are any persons that consume shellfish and/or aquatic plants and has any effort been made to interview people that eat these foods out of the seven watersheds. If people consume other aquatic biota like shellfish and plants, the benthic dwellers should be also sampled and considered for risk assessment. Please revise the HHRA to clarify these concerns and to identify all the species of shellfish and plants consumed (e.g., bivalves, gastropods, decapods, plants). Protected species, especially those listed by the Endangered Species Act, must be considered with the benefit of the input of the Fish and Wildlife Service, along with National Historic Preservation Act consideration of the cultural resource impacts based on Traditional Ecological Knowledge gained over generations of people who relied on these shellfish.

2. **Page ES-1, Last Paragraph:** The paragraph states, “In addition to the above, an evaluation of mine discharge was performed as part of the uncertainty analysis in this HHRA using the surface water scenario for both tribal lifeway and general public receptors. Mine discharge has been found to occur in a few locations in the OU5 watersheds; however, the potential for exposure to mine discharge is expected to be highly limited because of its intermittent occurrence, typical low flow rates, and relatively low accessibility.”

   Please explain: For example, how did EPA arrive at the determination that risk to exposure is “highly limited” because of “intermittent occurrence” at “typical” low flow rates with “relatively low accessibility?”

   Please provide data to justify these terms. Moreover, please define these terms. This HHRA appears to present numerous ambiguous and undefinable words. If needed, this HHRA should have a definitions section explaining some of the terms.

3. **Page ES-2:**
   It appears that the information given on this page bases a lot of its analysis on uncertainty and leads to a predetermination of its outcome as being conservative in its estimates. This scenario is concerning in that information could have been collected to reduce uncertainty but wasn’t and therefore, we must base our assumptions on uncertainty and as a result, the outcome is errantly designed as conservative. This is a recipe for confusion.
and collective failure. Too many assumptions equals less certainty. Taking more samples and taking into account the methods to increase certainty would provide a valuable service to the tribes and communities impacted by the Site.

4. **Table ES-1:**
   Please clarify the rationale for using a statewide dataset and not a site specific dataset. Please revise the HHRA accordingly. Sampling in each watershed with a risk assessment independent for each watershed would help end this uncertainty and better characterize the COCs in each watershed for the HHRA and eventual cleanup Feasibility Study. There is no excuse for going to state-wide dataset for such a complicated and polluted Site.

5. **Table ES-2:**
   It is unclear as to the rational for not including groundwater and surface and subsurface soil media in the HHRA. Any mining operations have the potential for contaminating soil media based on air emissions, incidental releases, storage yards, runoff, tailings, storage, etc. This should also include riparian zones and floodplains near and adjacent to contaminated water bodies. The floodplains should be well defined based on 25 up to 500 year flooding events. Wetlands should also be well defined along with gaining and loosing streams and their connections with groundwater. If soils in and around the mining operations have the potential to be contaminated based on the information noted above, then leaching potential should be assessed during the investigation. This table is limited to certain parameters and not water quality parameters such as pH, conductivity, turbidity, visibility, etc., which might harm benthic communities and other wildlife.
6. **Table 2a Response to Comments Provided by TCTCIT on Document No. 2, Item No. 9, Page 18: Regarding Topic #2e — Tribal Lifeways characterization — the exposure scenarios described in the HHRA memo do not include Tribal use of groundwater springs.**

The TCTCIT presented the following review comment on a prior Interim HHRA Deliverable.

“Many Tribal members and citizens visit groundwater springs within OU5 to gather plants for consumption (e.g., watercress) and to engage in cultural practices. During these visits, they are exposed via ingestion and dermal contact with the water and sediment. Exposure at groundwater springs should be included in the HHRA.”

We agree with this assertion; however, the “Section” states, “Topic #2e: Tribal Lifeways characterization – the exposure scenarios described in the HHRA memo do not include Tribal use of groundwater springs.” Furthermore, the “Response” was, “Groundwater is not a medium addressed under OU5. However, while water from groundwater springs are not specifically addressed in the HHRA, exposures to direct mine discharge are evaluated as a worst-case scenario in Appendix F3.”

Can mine water be used to replace spring water found in each of the seven watersheds to represent risk for Tribal Lifeways during sweat lodge ceremonies? What do these springs represent if now groundwater? Yet, groundwater is not characterized or represented in the HHRA.

We are concerned with how these decisions were made and to exclude these from the HHRA even if sampling has occurred in the past. How does the EPA know that the mine discharge is the worst case scenario and what is their proof? How does anyone know the magnitude of groundwater contamination and impact if it is simply not addressed in the HHRA? Our simple concern is that nature and extent of contamination has not been fully addressed and risk assessments should not be performed until you include all media (i.e., soils, sediments, groundwater, surface water, air, etc. in a HHRA.)
In the google earth map below, head water springs are found along the Tar Creek, from Kansas to the Neosho River. As can be seen when zoomed closer, wetlands are created by these springs. This information is helpful, not only for the RI and HHRA, but for the Feasibility Study. Groundwater contamination and the impacts, potentially, on endangered species and other plant and animal life, the impact and role of cleanup on performance of these wetlands, and remediation of the wetlands (if necessary) must also be considered. No narrative exists regarding springs in any of the watersheds studied. The HHRA should have studied the groundwater extent of contamination, and the quality of groundwater springs in each of the watersheds. Tribal peoples utilize springs like these for collecting water for healing and cultural practices, not just sweat lodges. These springs are sacred to those who practice healing and should be characterized for COC.

7. **Page 1-1, Section 1.1:**

The HHRA should be revised to include all appropriate media in its calculations and results. The HHRA should give complete rationale for not including groundwater and soils if appropriate. The HHRA should include that the nature and extent of
contamination has been defined in all media. It should justify why it does not follow the
nature and extent of known contamination in Ottawa County flowing downstream and
stops short before Twin Bridges State Park.

8. **Page 2-1, Section 2.1 Site Description:**

2.1 **Site Description**

The Tar Creek Superfund Site itself has no clearly defined boundaries, but consists of areas within
Ottawa County, Oklahoma, that have been impacted by historical mining wastes. Historical lead and zinc
mining was conducted in an area known as the Picher Field in northern Ottawa County where hazardous
substances from mining or milling were stored or disposed. The principal communities within the mining
area include Commerce and Quapaw, and the former Oklahoma mining towns of Cardin, Picher, and
Hockerville. Similar historical mining and waste disposal practices were performed in southeastern
Kansas and southwestern Missouri; these areas combined with the Tar Creek Superfund Site in
northeast Oklahoma comprise an area known as the TSMD. The TSMD, the OUS study area boundary,
EPA regional and state boundaries, and the various mining sites are depicted on Figure 2-2.

It is unclear why the Tar Creek Superfund Site itself “has no clearly defined boundaries.”
Under OU1 the site was defined and at the beginning of OU4. Now EPA is choosing to blur
the line between OU4 and OU5 by skipping back and forth when asked publicly about
inclusion of riparian and wetlands, for example, the boundaries could be defined by sampling
and additional investigation. If nature and extent is not defined, then the HHRA is not
defensible. From 1993, with the five year review of OU1 and with Draft Remedial
Investigation for OU-4 (the Final was never published), the “Tar Creek Superfund Site” was
defined as the areas within Ottawa County where TSMD wastes had come to reside. And,
OU-4 is defined as a 40 sq. mi. area of abandoned mines with tailings piles with boundary
drawn depicting the area.

If we are to assume that these are still accurate definitions, then why does the RI and HHRA
stop just short of Twin Bridges State Park with its investigation? This is done knowing full
well that contaminants are found in the sediments of Grand Lake in all three of it’s segments,
the State of Oklahoma has issue a fish consumption advisory for lead in fish, OWRB has
listed all of these streams and lake segments on the state’s 303(d) list of impaired streams for
failing to meet their Beneficial Use: Fishing because of lead, the tribes have identified COCs
in the plants of the riparian and floodplains downstream of Twin Bridges and the tribes have
cored the sediments with EPA grants that demonstrate the extent of metals contamination in
the lake.

We request EPA include Grand Lake in the OU-5 RI and HHRA or advise us of how quickly
EPA will begin work on OU-6 to deal with these issues. What is unacceptable is the decades
delay in the flow of contaminants from the OU-1/OU-4 Sites into Tar Creek downstream into
our communities and into our drinking water lake!! To shop short of preventing off-site
spread of contaminants into our communities and lake once again, after decades of ignoring
this injustice, is unheard of. Everything we learn about site characterization, modeling and
risk is has been out the window with this site from the beginning.
9. **Page 2-2, Section 2.4, Third Paragraph, Third to the Last Sentence:**

   “Paddlefish are one of the most unique fish in Oklahoma and are sought out for their fillet and roe (caviar).”

   It is unclear if this statement is accurate. It appears that the study only assumes that fish are portioned as a fillet. It should be assumed that paddlefish would also be consumed whole (i.e., “bone-in”) as well. Please revise the HHRA by clarifying if the paddle fish, and other fish, are also consumed whole. If so, please revise the HHRA to include this information and adjust the HHRA calculations accordingly.

   In addition, if people eat whole fish, samples of the whole fish should be analyzed and included in the risk assessment calculations.

10. **Page 2-2 and 2-3, Section 2.5, Conceptual Exposure Model:**

    This section is inadequate and incomplete based on the elimination of groundwater and soils (i.e., surface, and subsurface) from the Conceptual Exposure Model (CEM). These medium should be included based on use and contact with groundwater (via pumping from wells), springs, and soils. The soils should be included based on exposure to mining tailings, aeolian blown environments, large piles of disposed tailings and excavated soils, elicit use and easy access to mined material for personal use (i.e., paving roads, use as fill material for home projects, farming/gardening land, etc.), and subsurface soils that are potentially exposed to contaminants by leaching.

    Please revise the HHRA by including groundwater and soils (i.e., surface and subsurface), and also including mining tailings and other excavated materials as appropriate to minimize uncertainty in the development of the HHRA.

11. **Page 2-3, Section 2.5, Last Bullet:**

    “Aquatic biota (fish, shellfish, aquatic plants, amphibians/aquatic reptiles, and semi-aquatic mammals). Food consumption (ingestion) for a tribal lifeway (adult and child), food consumption (ingestion – fish only) for the general public (adult and child), and medicinal use (dermal – aquatic plants only) for a tribal lifeway (adult and child).”

    On Page 2-2, Section 2.4, Third Paragraph, Last Sentence, however, it states:

    “Additionally, turtles and bullfrogs can be caught with a fishing license.”

    It appears from the HHRA that the results are based-on and biased toward “fish only” and aquatic plants for dermal use) while other aquatic animals such as amphibians (e.g., turtles) and amphibians (e.g., frogs) can be caught and consumed. Moreover, crawfish were not sampled either. In addition, Shellfish and aquatic plants, and other semi-aquatic mammals should be also considered for the HHRA as well.

    The HHRA’s assumptions do not take into account all animals consumed by humans that have been in direct and indirect contact with contaminants related to the Tar Creek Superfund Site nor specifically to the individual watersheds examined. This scenario creates uncertainty. To sample populations of plants and animals that are in contact with the contaminants of concern and are consumed by humans would reduce uncertainty and would assure that the HHRA is protective of human health.
Please revise the HHRA to include all plants (including all parts of the plant like leaves, stems, roots, etc.) and animals that are consumed by humans that have been in contact with the contaminants of concern. For example, Wild onions and wild asparagus are gathered throughout the site annually as well as blackberries and nuts.

12. Page 2-3, Section 2.5, Conceptual Exposure Model, Last Paragraph:

"In addition to the exposure scenarios listed above, an evaluation of mine discharge was performed using the surface water scenario for both tribal lifeway and general public receptors. Mine discharge has been found to occur in a few locations within OU5 watersheds; however, the potential for exposure is expected to be highly limited because of its intermittent occurrence, typical low flow rates, and relatively low accessibility. Evaluation of this scenario is presented as part of the uncertainty analysis (Section 6.6.2.4 and Appendix F3)".

Please revise this paragraph by defining the following terms: “few locations”, “highly limited”, “intermittent occurrence”, “typical low flow rates”, and “relatively low accessibility”.

These terms are ambiguous and unclear to the reader and should be clarified by sampling contaminated medium, taking clear and concise measurements of flow rates during seasonal variations, stating the exact number of locations by counting them, determining by statistical means the intermittent cycles, and determining the accessibility and restricted areas and showing these features on clear and concise figures. In addition, by obtaining proper, defensible, and repeatable data/information, will result in minimizing uncertainty and increasing confidence in the HHRA results.

13. (Sect. 2, p.21)

“In addition, the HHRA for terrestrial small and large game ingestion scenarios found in OU-4.”

How is the HHRA for OU-4 justified as potentially duplicating an OU-5 HHRA that included data from terrestrial and semi-aquatic animals and plants in the seven watersheds of this study?

“Pastureland, hay, or expanding residential development is the main land use in the OU5 study area, with limited industrial or commercial operations. Nearly all the native prairie and most of the forests are gone, except in riparian areas. Much of the historic Picher Mining District no longer supports vegetation due to extensive tailings remaining on the surface from the mining operations (Woods et al., 2005, sec. 2.4, p.22).”

14. Flooding:

The problem of frequent devastating floods in the watersheds of this study over the past two decades have not been addressed by the RI or the HHRA. Not only are contaminated sediments moved by extreme floods we have experienced (such as the recent flood of 2019) but riparian and flood plain areas receive deposits of sediments, further contaminating flora and fauna. In addition, the farms and cities along the streams are potentially exposed to contaminated mine water as Tar Creek and Bever Creek spill over their banks, flooding yards, farms, schools and high access areas. Grand Lake O’ the
Cherokee is a driver of this phenomenon and is not considered in the HHRA as part of the exposure dynamic. Should OU-5 remediation succeed, flooding could continue to re-contaminate the streams and sediments with metals from riparian and floodplains as floodwaters recede. **The Site Conceptual Model for OU-4 and OU-5, therefore, are flawed.** Not including riparian and floodplains in the watershed RI and HHRA constitutes a flawed model in the EPA Region 6 approach that has caused other Sites in the country to have to be re-evaluated and remediated AFTER completion of RODs. We advise EPA not to make this same mistake!

EPA is fully aware that Grand River Dam Authority is seeking a renewal of its license for the hydro-dam that creates Grand Lake. The new license request seeks an additional 2 feet of lake pool and Army Cops is seeking an additional 4 feet of flood pool. How will this impact exposure to the area? Clearly, this HHRA insinuates EPA is not concerned. Neither is GRDA, Army Corps or FERC! **If this is the case, who protects this Environmental Justice community??**
In Summary

We request that EPA address ALL of our concerns raised. Much has been left out of this site characterization and HHRA to the point that this study is very incomplete and the RI/FS and delineation of OUs should be redone with the benefit of the data, input, and analysis required by
federal laws. We request that this document be withheld until all these issues can be addressed to the satisfaction of the stakeholders who have lived with this Site for so many decades, along with other contamination issues that exacerbate the metals exposure present at the site; such as, heavy nutrient loading in Grand Lake and the streams that cause trophic conditions. Allowing intense poultry operations into these watersheds along with other polluting industries violates the intent and spirit of Environmental Justice. We seek to address these problems, but without help from EPA and the State, it is extremely difficult. In fact, we get no help from agencies on this matter, only fast track permits, and the new concept of permits for life (Oklahoma’s coal ash program approved by EPA, which GRDA participates)!

We look forward to working with EPA in rectifying the discrepancies in the HHRA. We have enjoyed a long-term relationship with the agency. If you have further questions, please do not hesitate to contact us.

Sincerely,

Earl L. Hatley, Grand Riverkeeper
LEAD Agency, Inc.

Rebecca Jim, Executive Director, Tar Creekkeeper
LEAD Agency, Inc.

Cc: Louis “Red” Mathia, President, LEAD Agency
    Travis Stills, Energy & Conservation Law