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Northwest Medical Isotopes, LLC - Request to Submit a Two-Part Application

Comment On: NRC-2013-0235-0014
Construction Permit Application for the Northwest Medical Isotopes, LLC, Medical Radioisotope Production Facility; Request for Comment on Draft Environmental Impact Statement

Document: NRC-2013-0235-DRAFT-0007
Comment on FR Doc # N/A

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General Comment

See Attached File

Attachments

Docket ID NRC

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Cindy Bladey, Chief, Rules, Announcements, and Directives Branch
(RADB), Division of Administrative Services, Office of Administration, Mail Stop:
OWFN-12-H08, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001.

RE: Comments on Proposed Action Docket ID NRC-2013-0235, Environmental Impact Statement for the Construction Permit for the Northwest Medical Isotopes, LLC (NWMI) Medical Radioisotope Production Facility, Draft Report for Comment NUREG-2209

The proposed Federal action is for the NRC to decide whether to issue a construction permit under 10 CFR Part 50 that would allow construction of the NWMI medical radioisotope production facility. Due to the unique environmental attributes of this site, and based on items that were either not reviewed or are understated in the report, we believe the location of the site, particularly the construction activities. will have a significant impact on the environment.

Areas that have **more than a small impact** include the following:

Water Resources, Ecological Resources, cumulative Impacts, and Endangered Species. We agree with the report concerning the cumulative impact having a moderate impact on the environment, and believe that this should translate into more than a low impact for this particular project; based upon the fact that its location is in one of the environmental sensitive areas of the County, if not of the State; within the Gans Creek Watershed; and it should be sited elsewhere.

We take issue with the determination that the proposed action would result in no effect to species and habitats protected under Federal or State laws, including the Endangered Species Act of 1973, as amended. We have comments on the following different areas:

Area 1- Too many unknown geological factors for a Nuclear Facility: The project concerns the construction of a major manufacturing facility handling hazardous and radioactive waste. This requires deep footings placed into an area that has karst topography and an uncertain water table. I personally own a house in a subdivision near the State Park. Many of the homeowners there have experienced first floor water problems that are not always related to surface run-off, but are related to water table problems that vary by location due to sub surface Karsts Topography in the Area. The project should not be approved without further exploration of Karst features that may exist on the site.

Area 2: "Large Water Requirements for constructing the NWMI Facility is needed for: Dust control/soil compaction, workforce potable and sanitary use (a), washing and miscellaneous uses, will amount to a total of (construction phase)(c) 2,088,000 " gallons. This is potentially a lot of water and silt that would be running down the creeks during the construction period. In our opinion, the City has a spotty record of enforcing stormwater regulations, and in many cases, there is no enforcement of stormwater regulations. Who will enforce the standards for construction run-off into a sensitive stream. Given the location of the projects, standards for this project should be much higher than the normal residential subdivision.

Area 3: Length of the construction period will create major and accumulating problems with drainage at the site. The construction period would last 17 months, resulting in a substantial impact on the environment and a decrease in quality of surface water in Gans Creek and associated aquifers. Water would be required for various purposes, such as dust suppression and soil compaction during NWMI facility construction. "Activities requiring water would include, but would not be limited to, site clearing and grading, facility excavation, support facility construction, roadway development, and installation of site drainage and utilities. Facility decommissioning activities would require water for many of the same purposes as construction in association with facility demolition and decontamination."

"Excavation depths could range from 17 to 23 ft below grade (5.2 to 7 m) for portions of the RPF, as described in Section 4.3.1. During the preliminary geotechnical investigation of the Discovery Ridge Research Park in 2011, the geotechnical contractor encountered groundwater in two soil borings at depths of approximately 12 to 18.5 ft (3.7 and 5.6 m) bgs (see Section 3.4.2.1). Therefore, groundwater dewatering will be required during construction."

In response, the report goes on to say, " NWMI will conduct site-specific geotechnical and hydrologic studies of the Discovery Ridge site (NWMI 2015c). These studies would help to determine whether a seasonally high water table or perched groundwater exists beneath the site, as well as guide any necessary construction accommodations and final facility design. NWMI estimated the maximum potential dewatering rate for site excavations (NWMI 2016a). NWMI used very conservative parameters for runoff area and precipitation yielding a maximum dewatering rate of 1,400 gal (5,300 L) per hour." "The NRC staff expects that dewatering could have minor effects on the vertical and horizontal extent of shallow groundwater, if present, and on groundwater flow direction, but any effects would be localized and temporary. Site groundwater conditions could potentially affect facility construction and final design. These include the potential for wet subsurface conditions, including a seasonally high water table or perched groundwater beneath the site. To address these potential issues, site-specific geotechnical and hydrologic studies are planned that will characterize site conditions in support of final facility design. These studies would ensure that the completed facility incorporates any necessary design features such as foundations protected with water barrier systems 11 (e.g., sealants) and foundation drainage and water diversion systems (NWMI 2016a). " "Total projected water use for the 17-month construction period is approximately 2.1 million gal (7.9 million L).

In other words, thorough investigations have not been completed to determine the extent of the groundwater on the site. We note that there have been no conclusive investigations to determine if the high water table found was due to Karst Topography or to standing water from storm water. This would be a huge difference in both cost and impact on the environment. We can conclude that the permit should not be considered, until the source of the high water table it found is identified. Changes in a permanent waterway, could affect the feasibility of the project and the impact on surrounding properties.

Area 4: There are several natural areas in the vicinity of the site that will be impacted by the project; these impacts are minimized in the report. According to the report, "approximately 7 percent (1,427 ha (3,527 ac)) of the 5-mi (8-km) vicinity surrounding the proposed Discovery Ridge site is parks or conservation areas, such as Rock Bridge State Park, Three River (should be "Creeks) Conservation Area, and the northwest corner of the Mark Twain National Forest." The report failed to mention the City's Gans Creek Recreation Area, which is closest to the site and includes large tracts of forested and old farm land on "both" sides of Gans Creek. The Gans Creek Recreation Area is adjacent to Rock Bridge State Park and provides continuous wildlife corridors, both above and below ground on both sides of the creek. Most of this area is available for hunting. The area contains an additional 325 acres not included in the 7% report and the regional office of the Department of Missouri Department of Conservation. The area also includes "Elbow Cave" and a spring that falls over a high bluff. Less than half of the site is used for active recreational activities such as soccer fields etc. The Gans Creek Recreation Area is located less than one mile away from the site, while major natural features typical of Karst Topography, such as caves and springs are located within 1.2 miles of the site; with associated flora and fauna that may be impacted by the project. Finally, there is a seasonal Blue Heron rookery observed, located in the action area in the Gans Creek Recreation Area, that is also likely in the Action Area.

Area 5: The project could have an impact on the "Wild Area" in Rock Bridge State Park: Similar to the Gans Creek Recreation Area, and much larger, Rock Bridge State Memorial Park, which is an 858-ha (2,120-ac) park that consists of karsts, grasslands, and oak woodlands and forests (MDNR 2016a). This State park also contains the Gans Creek Wild Area. The Gans Creek Wild Area is managed as a wilderness Area. A large portion Rock Bridge State Park has large areas of native grasses, which are not mentioned in the report and are downplayed by the authors of the report. In fact, the State Park has gone to great lengths to restore most of the fields in the park to native grasses. This has not been recognized in the report. Our conclusion is that the project should be located as far away from these recreational and natural areas as possible; this one is not.

Area 6: The report indicates that "The Missouri Department of Conservation (MDC) manages the Three Creeks Conservation Area, which is a 607-ha (1,500-ac) natural preserve that consists mostly of oak forests and woodlands and provides cave habitat for bats (MDC 2016a). A small portion of the Mark Twain National Forest, Cedar Creek Ranger District, is also located within the vicinity of the proposed site (USDA 2016a). The Mark Twain National Forest consists of tall grass prairies and shortleaf pine-oak woodlands". **Three Creeks also has many caves, including two major caves, "Hunters Cave" and "Tomlin Cave". As is in the name, there are three creeks all lined with high cliffs and have plenty of**

Habitat to support native species, including rare and endangered species not accounted for in the report. These would include, the Topeka Shiner (that may or may not still be there, but should be considered there for protection), and the Cherrystone snail, found at only one other location in the U.S.(not listed in this report).

Area 7: Soils in the Area make construction difficult, particularly at lower elevations where water is held: The report says that "Soils in the area generally consist of a yellowish clay till mixed with sand and pebbles. Deposits of loess (windblown glacial sediment) are also widespread throughout the County, but the deposits are thickest along the bluffs of the Missouri River to the south of the site (BCC 1996). Glacial drift generally covers the eastern half of Boone County whereas residuum (weathered bedrock material) is the predominant bedrock cover over the western half of the County. This generally supports the overburden mapping information provided in the NWMI ER (NWMI 2015a). Specifically, the surficial geologic unit at the Discovery Ridge site is mapped as glacial drift (unit F). This unit is characterized as light tan to dark gray silty clay and clay till. The clay is mixed with pebbles of limestone, chert, and quartzite. Sands, cobbles, and boulders may occur in pockets, lenses, or as channel deposits. A layer of loess ranging from 1 to 5 ft . (0.3 to 1.5 m) thick typically covers the drift. A clay-rich paleosol (i.e., a buried soil horizon) often occurs at depths ranging from 6 to 8 ft (1.8 to 2.4 m). In total, this unit ranges from 10 to 12 300 ft (3-91 m) thick. However, based on bedrock contour mapping data derived from well logs, the total thickness of the drift and other overburden material in the vicinity of the Discovery Ridge site is approximately 25 ft (7.6 m) (MGS 2016).

Terracon, a consulting engineering firm, performed a preliminary geotechnical investigation of the Discovery Ridge Research Park in 2011, which encompassed the proposed site (i.e., Lot 15 of the research park) (Terracon 2011a). The purpose of the investigation was to provide preliminary geotechnical recommendations concerning earthwork and the design and construction of foundations, floor slabs, and pavements for Discovery Ridge properties (NWMI 2015a). Terracon drilled nine boreholes (designated B-1 through B-9) across the research park as part of the 2011 study. The borings were advanced to depths ranging from 13 to 20 ft (3.9 to 6.1 m) below ground surface (bgs). Laboratory tests were also conducted on select samples, including soil density, compaction, plasticity and liquid limit tests (NWMI 2015a; Terracon 2011a). **All 25 boring samples measured were found to have relatively high water content,** generally in the range of 18 up to 35 percent (Terracon 2011a). For the surveyed areas as a whole, the boring logs indicate the presence of lean to fat clay and fat clay in the upper part and underlain by clay, trace sand, gravels, and cobbles representing glacial drift. Clay fill was encountered in the upper part of two borings completed at locations to the west of the Discovery Ridge site (i.e., borings B-3 and B-4 located west of Discovery Ridge Parkway). A single boring (designated B-5 in Terracon 2011a) drilled on the eastern boundary of Lot 15 is most representative of the proposed site. Table 3–6 summarizes information on the nature of the surficial materials obtained from this boring. Table 3–6. Summary of Boring Log B-5 Completed in the Vicinity of the Proposed NWMI Facility Site, Discovery Ridge Research Park Interval Depth, ft. (bgs)USCS Class Symbol and Name Interval Description/Interpretation of Surficial Materials;

0.3 – Topsoil

0.3 to 3 CL–Lean Clay Lean Clay: brown, trace gray, stiff

3 to 8 CH-Fat Clay Fat Clay: gray with red, stiff

8 to 12 CH–Fat Clay Fat Clay: reddish brown and light gray, trace sand and gravel, possible cobbles, very stiff (Glacial Drift)

Water level at 12 ft. bgs after boring completion

12 to 17 CL–Lean Clay,

CH–Fat Clay

Sandy Lean to Fat Clay: reddish brown and light gray, trace gravel, possible cobbles, stiff (Glacial drift);

Water level at 16.5 ft. bgs while sampling

Source: NRC staff interpretation of information in Terracon 2011a

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As shown in Table 3–6, clays appear to comprise much of the 1 surficial strata at the Discovery Ridge site. Fat clays include inorganic clay minerals of high plasticity. **These materials characteristically have high compressibility, poor shear strength when wetted, and have generally poor workability as a construction material, including for use as structural (engineered) backfill (SCS 1990). Moreover, as indicated by Terracon and as referenced by NWMI in its ER, fat clays are termed expansive or swelling soils because they expand or swell with changes in moisture content** (NWMI 2015a; Terracon 2011a). **Such soils with a high shrink/swell potential can damage concrete and other structures with changes in moisture 9 content and soil volume. Terracon determined that some of the soils encountered during drilling had moisture levels above their measured plastic limit. Such soils may be prone to rutting and pumping (rebound) when a load is applied, which results in unstable subgrade conditions during construction (Terracon 2011a). Nevertheless, Terracon made no determination about the liquefaction potential of these soil materials (NWMI 2015h). Weathered bedrock (identified as limestone) was encountered in only two borings (B-6 and B-7).** 15 at depths of approximately 17 and 13 ft bgs (5.1 and 4.0 m) bgs, respectively. These boring sites are located approximately 1,000 ft (300 m) south of the proposed NWMI facility site (Lot 15, Discovery Ridge site) and toward the shallow valley traversed by Gans Creek. While geotechnical investigations conducted to date have not determined the precise depth to or nature of bedrock beneath the proposed site, available mapping data indicate that the depth to bedrock is approximately 25 ft (7.6 m) (MGS 2016). Geologic mapping (Stoeser et al. 2007) reveals that rocks of the Cherokee Group of Pennsylvanian age (i.e., 299 to 318 Ma) immediately underlie the site. This is consistent with the geologic mapping provided in the NWMI ER (NWMI 2015a) and adapted as Figure 3–12"

The report indicates that "Burlington limestone is the principal limestone exposed in quarries, creek banks, and road cuts near and around Columbia. As referenced by NWMI (2015a), this limestone unit is relatively soluble and contains many caverns and passages indicative of karst terrane. Karst terrane is a landform underlain by soluble carbonate bedrock and characterized by the presence of springs, caves, and sinkholes."

We can conclude, as a building site, the soils are rated as poorly suited for excavation work because of the depth to the saturated zone, high clay content, and instability of excavation walls. In addition, due to the presence of clays with a high/shrink swell potential, as previously discussed in Section 3.3.1, the soils are rated as very limited for constructing commercial buildings. Shrink/well potential and the relatively shallow depth to the zone of saturation adversely affect the ability of soils to support structural loads (e.g., building slabs, foundations, and pavement structures) without movement and also affect the workability of site soils during construction (NRCS 2016a).

<u>Area 8, Surface Drainage not Favorable for the Project:</u> It is our opinion that the project and associated development in this portion of Discovery Park will have a negative impact on the environment, and will pollute not only Gans Creek, but other creeks and caves in the area. The report says that "The Discovery Ridge site currently drains south and southwest towards the southwesterly flowing Gans Creek, located approximately 0.35 mi (0.56 km) south of the site at its closest point (see Figures 3–11 and 3–13). Based on observations made by the NRC staff during the environmental site audit in September 2015, most site drainage occurs as overland sheet flow across the site with some drainage conveyed to ditches that border an access road associated with the future extension of Discovery Drive that would connect land parcels bordering the proposed site to the south. The NRC staff observed that these ditches convey runoff further **southwest across Lot 9** of the Discovery Ridge Research Park via a meandering drainage way and toward an engineered drainage channel that parallels U.S. Highway 63. **This channel ultimately discharges to Gans Creek south of the site.** Topographic maps (USGS 2015a), historical photography, and other records reviewed by Terracon (2011a) indicate that at least some of these drainage features may mark the remnants of a headwater tributary to Gans Creek. Nevertheless, the engineered drainage channel receives runoff from surrounding parcels and drainage and overflow from an existing human-made lake (located to the northwest of the Discovery Ridge site and immediately adjacent to the existing IDEXX BioResearch facility), which serves as a stormwater management pond and has an associated drainage channel."

"Affected Environment - From just south of the site (Figure 3–13), Gans Creek flows beneath U.S. Highway 63 and continues west to southwesterly in a winding path for approximately 6 stream mi (9.7 km) before joining Clear Creek. At this confluence, the Little Bonne Femme Creek begins. Little Bonne Femme Creek continues flowing southwesterly for some 9 mi (14 km) along a winding course before entering the Missouri River....The Bonne Femme watershed is situated on karst terrane as referenced in Section 3.3.1. Surface water hydrology is complex because of the presence of losing (sinking) and gaining sections of streams where surface water can easily enter the subsurface, providing flow to other streams. Karst streams, and underlying groundwater, are very susceptible to upgradient pollutant sources and contaminant transport. Within the watershed, there are two main recharge areas tied to these losing and gaining sections of stream, the Devil's Icebox cave and the Hunter's Cave recharge areas (Frueh 2007; NWMI 2015a). Carlson et al. (2005) states that Gans Creek is the first gaining stream due to surface water lost through the Devil's Icebox cave. Thus, the Bonne Femme and Little Bonne Femme creeks are interconnected where surface water lost from Bonne Femme Creek is lost through the Devil's Icebox Cave Branch (across the surface water divide) into Gans Creek and is eventually discharged to Little Bonne Femme Creek (Figure 3–13) (Frueh 2007; NWMI 2015a)."

Conclusion is that the project will have at least a moderate if not high impact on the environment when taking together with other projects planned for the watershed. All of the waterways are somewhat connected due to the Karst Topography.

Despite a clear indication to the contrary, "Based on the results of its preliminary geotechnical report and available geological mapping of the area, Terracon concluded that there are no known caves or sinkholes within approximately 1 mi (1.6 km) of the Discovery Ridge Research Park. Karst features are present to the west and southwest of the Discovery Ridge site, with the nearest sinkhole features lying approximately 1.3 mi (2.1 km) southwest (MGS 2016). However, changes in site conditions, such as grading and drainage alteration, can result in sinkholes even in areas with no history of sinkhole development (Terracon 2011a)".

Area 9 Affect on Water Quaility: Within the State, all perennial rivers and streams, streams with permanent pools, and lakes and reservoirs that intersect the flow lines of perennial rivers and streams are designated for the following beneficial uses: aquatic habitat protection; human health protection, whole body contact recreation, and secondary contact recreation; and livestock and wildlife protection and irrigation (10 CSR 20-7.031). These uses apply to Gans Creek and other major streams within a 5-mi (8-km) radius of the Discovery Ridge site. Furthermore, a 3 mi (4.8 km) section of **Gans Creek is classified by the State as an Outstanding State Resource Water** (10 CSR 20-7.031) **and denoted as an environmentally sensitive area by Boone County (Boone County 2016a). Outstanding State resource waters are high-quality waters with a significant aesthetic, recreational, or scientific value and specifically designated as such by the State's Clean Water Commission. Such waters may require exceptionally stringent water quality management requirements to assure conformance with the State's antidegradation policy. This special segment of Gans Creek is located within the Rock Bridge State Park, located approximately 3 mi (4.8 km) southwest of the Discovery Ridge site (see Figure 3–13)....."**

".....Of particular relevance to the Discovery Ridge site, these included monitoring locations on Clear Creek, Gans Creek, Upper 13 Bonne Femme Creek, Little Bonne Femme Creek, and at the two karst recharge areas including Devil's Icebox cave. Samples were collected at all sites once per quarter beginning in 2003. In addition to measurement of standard physical and water quality parameters, samples were analyzed for various herbicides and for the presence of bacterial contamination. In summary, general water quality parameters were found to be typical for streams in carbonate bedrock areas. Dissolved oxygen levels exceeded the State standard of 5 milligrams per liter (mg/L). Nutrient levels were similar to or less than streams in other comparable agricultural watersheds, and there was no indication of acute contamination at any site. Although field observations and monitoring results revealed nuisance algal growth, no excess nutrient enrichment (eutrophication) was found at any site. One or more herbicides was detected at every site but generally at low levels. Widespread fecal bacterial contamination was evident, with the highest levels found during the spring and summer. The fecal bacteria standard for whole body contact was frequently exceeded. The primary cause of bacterial contamination at most sites was attributed to cattle grazing (Frueh 2007)."

"Downstream of the Discovery Ridge site, the surface water hydrology is rather complex as the watershed is founded on karst terrane. Due to the occurrence of soluble carbonate bedrock, karst features include the presence of losing (sinking) and gaining sections of streams where surface water can easily enter the subsurface, providing flow to other streams. These features make surface waters and underlying groundwater particular vulnerable to contamination. Gans Creek and other streams within the Bonne Femme Creek watershed have been designated by the State for the following beneficial uses: aquatic habitat protection; human health protection, whole body contact recreation, and secondary contact recreation; as well as livestock and wildlife protection and irrigation. In addition, the State of Missouri has classified a 27 3 mi (4.8 km) section of Gans Creek as an Outstanding State Resource Water. Boone County has also designated this section of stream and adjoining areas as an environmentally sensitive area and includes karst features such as Devil's Icebox Cave within Rock Bridge State Park (see Section 3.4.1.2). An intensive study of the watershed conducted by Federal, State, and local stakeholder agencies (Frueh 2007) found water quality parameters to be typical for streams in carbonate bedrock areas and not seriously degraded from a hydrologic and water quality perspective."

Our position is to site projects as far from Gans Creek as possible to keep it as an outstanding water resosurce.

Area 10: Affected Species: "The Bonne Femme Stakeholder Committee (BFSC 2007) determined that fish communities within the Bonne Femme watershed and nearby streams generally range from 11 to 17 species, and commonly include shiners, minnows, suckers, redhorse, sunfish, bass, darters and stonerollers. NWMI (2015c) observed creek chub (Semotilus atromaculatus) in small pools of Gans Creek on September 30 and October 1, 2015. Gans Creek was not flowing at the time of the observation. The NRC staff also searched FishNet (2014), which is a collaborative effort by the National Science Foundation, National Biological Information Infrastructure, and other natural history and biodiversity institutions to compile a database of fish survey results. FishNet (2014) contained records for two fish species within the vicinity of the proposed Discovery Ridge site. Small mouth bass (Micropterus dolomieu) were collected from Little Bonne Femme Creek in October 1978. Smallmouth bass are relatively common within this watershed.

In March 1960, orangethroat darter (Etheostoma spectabile) were collected from the spring branch of Gans Creek. Orangethroat darter is endemic, or solely unique, to the Mississippi River basin and the Lake Erie basin. However, given the age of the data, it is not certain whether these species still occur within the Bonne Femme watershed. Portions of Gans Creek are considered Fish Spawning Stream Reaches, which is one of 138 State-designated fish spawning stream segments (MDC 2015). The State designates stream reaches as Fish Spawning Stream Reaches if they contain highly diverse fish communities, provide habitat for fish species of conservation concern, and if they are important to maintaining, restoring, or avoiding future listing of Species of Conservation Concern (MDC 2015).

Streams and other waterbodies within the Bonne Femme watershed also contain many invertebrates, such as mayflies, stoneflies, caddisflies, dragonflies, beetles, small crustaceans, and snails. BFSC (2007) determined that 18 to 27 invertebrate species are estimated to inhabit 32 streams within the Bonne Femme Watershed."

Area 11: Endangered Species clearly located in the area Area are not Identified in the Report

The report says that " The implementing regulations for section 7(a)(2) of the ESA define "action area" as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action." (50 CFR 402.02). The action area effectively bounds the analysis of ESA-protected species and habitats because only species that occur within the action area may be affected by the Federal action. For the purposes of the ESA analysis in this EIS, the NRC staff considers the action area to include the lands within the 7.4 ac (3.0 ha) proposed site, the adjacent offsite area that would be used as a temporary construction staging area, **and the surrounding area where runoff drains and activities would be audible to wildlife. The NRC staff expects all direct and indirect effects of the proposed action to be contained within these areas. The NRC staff recognizes that while the action area is stationary, Federally listed species can move in and out of the action area.** For instance, a flowering plant known to occur near, but outside, of the action area could appear within the action area over time if its seeds are carried into the action area by wind, water, or animals. Thus, in its analysis, the NRC staff considers not only those species known to occur directly within the action area, but those species that may passively or actively move into the action area. The staff then considers whether the life history of each species makes the species likely to move into the action area where it could be affected by the construction, operations, and decommissioning of the NWMI facility."

The report says that "The NRC staff compiled this table from the FWS's online database (FWS 2015a), correspondence and discussions with the FWS (FWS 2015a; NRC 2015e), and the NWMI ER 25 (NWMI 2015a). As described in Section 3.5.3, NWMI conducted ecological surveys in the action area and did not observe any Federally protected species on the proposed site (NWMI 2015a). Based on the surveys described in Section 3.5.3, the NRC staff did not identify any Federally listed species that could exist in the action area. In addition, the NRC staff reviewed the habitat requirements for the Federally-listed species in Table 3–9. The NRC staff determined that the proposed site provides unsuitable habitat for all the Federally-listed species in Table 3–9. The NRC staff did not identify any candidate species or proposed or designated critical habitats within the action area. Given the available information, the NRC staff concludes that Federally listed, proposed, or candidate species are unlikely to occur within the action area."

State-listed Species: Table 3–9 includes the State-listed species that have the potential to occur on or near the proposed Discovery Ridge site. The NRC staff compiled this table from the MDC's description of State-listed species (MDC 2000a, 2000b, 2016b), MDC's Natural Heritage Review (2015 and 2016 [June 2 letter]) reports, and the NWMI ER (NWMI 2015a). As described in Section 3.5.3, NWMI conducted vegetation surveys in the action area and did not observe any State-protected

species on the proposed site (NWMI 2015a). Furthermore, habitat to support State-listed species does not occur on site. Based on the surveys described in Section 3.5.3, the NRC staff did not identify any State-listed species that are likely to occur in the action area."

"In Section 3.5, the NRC staff concludes that no Federally listed species are likely to occur in the action area. The NRC staff also concludes that no candidate species, proposed species, or designated critical habitat occur in the action area. Thus, the NRC staff concludes that the proposed action would have no effect on Federally listed species or habitats under FWS's jurisdiction."

"The NRC staff reviewed the habitat requirements for the State-endangered species in Table 3–9. The NRC staff determined that the proposed site provides unsuitable habitat for all the State-endangered species. The Topeka shiner (Anguilla rostrate), which is State endangered, historically inhabited the watershed, but its occurrence has not been reported since 1997 (BFSC 2007). MDC's (MDC 2016e) natural heritage report did not identify any state-listed endangered species, state-ranked species, nor any natural communities within the project area. Because no State-listed species have the potential to exist within the proposed Discovery Ridge site, this EIS does not discuss State-listed species in any further detail."

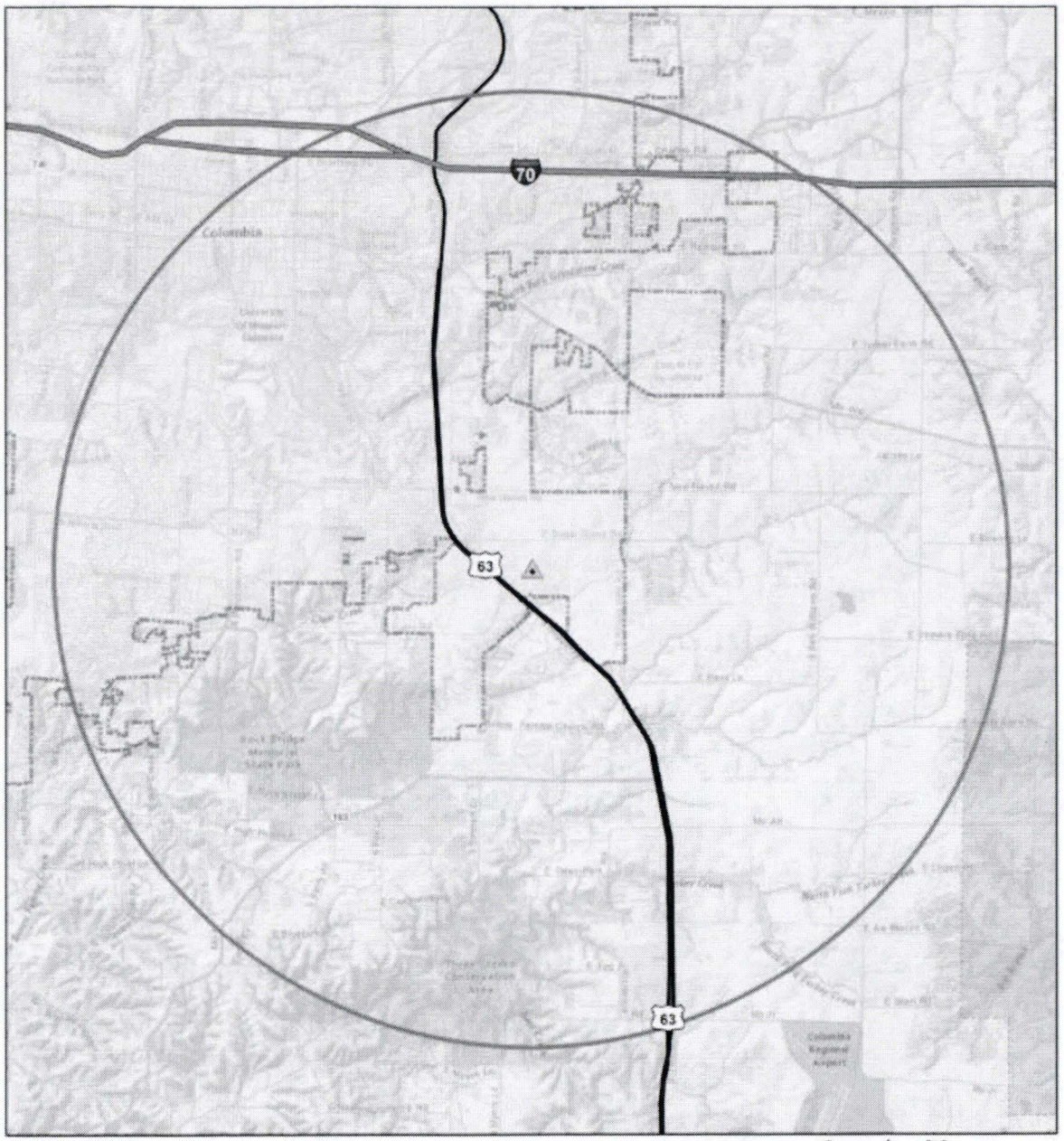
We believe there are a number of rare and endangered species that are not discussed in the report or are not given any benefit of doubt; and therefore we believe there appeared to be no credible search for endangered specified in this report. The topic appeared to be dismissed out of habit rather than truly reviewing the impacts on endangered species that frequent the Area. Our research and previous observations indicate that there is a high likelihood of the presence of endangered species in the Action area and that the project could have an impact on rare and endangered species in the area.

According to Rock Bridge State Park Officials, the "Devil's Icebox Cave has a total mapped passage distance of more than seven miles. Over the years, these spacious cave passages have become the home to especially adapted animals. The cave is the only known habitat for the pink planarian, a species of flatworm. The cave's watershed of several thousand acres contains hundreds of sinkholes as well as losing streams, which allow water to drain down cracks in the limestone rock and flow into the cave." The water's quality affects the pink planarian and other cave animals. There is a good chance that portions of the cave are in the action area. In the absence of checking all of the sinkholes, we must assume they are there. Species to mention include:

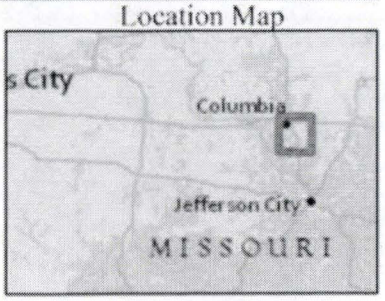
- Gray Bats frequent the devils ice-box cave on a seasonal basis. There is a very high probability that this bat inhabits the caves clearly located in the action area of this project. Suggest referral to information on grey bats provided by Rock Bridge State Park. Note that the Devils Icebox Cave ranks in the top three of the largest caves in the state ("the Cave State") and maybe the world. There are a large number of unexplored passageways; that sometimes do not correspond to the presence of streams on the surface. In season, I have observed a huge number of grey bats exiting Devils Icebox cave at dusk. Endangered gray bats use the cave as a

summer roosting site to give birth to and raise their young. Each gray bat eats several hundred insects each night above ground and then deposits guano in the cave during the day and so plays an important role in two ecosystems.

- Indiana Bats frequent the Area on a seasonal basis. Again, they could possibly be found on trees or caves in the action area affected by the project.
- The Pink Planarian, a small worm found only in Devils Icebox cave was not mentioned in the report. There is a complete description of this endangered species found on the marque next to the Devils icebox cave.
- The Cherry Stone Snail, located nearby at Three Creeks Conservation Area, and located only two places in the U.S., were also not mentioned in this report. Although it is likely not found in the action area.
- The possible existence of the Topeka Shiner should not be dismissed off hand in the absence of legitimate studies. Topeka shiner thrives in pools of small prairies, and streams with good water, quality, and gravel. Streambeds. No true study was cited to determine that the species does not exist. They have most recently been found at Three Creeks Conservation Area. Therefore, we do not make a claim that the project will impact the Shiners; however, given the karst topography of the area and cross connections in various watersheds, some impacts cannot be dismissed.



Location Map



Proposed Site

8 km (5 mi) radius from proposed site

Interstate Highways

Highways

City Limits

Mark Twain National Forest

N

0 0.5 1 2 3 4 Miles