



June 15, 2007

John E. Kieling, Project Manager  
State of New Mexico Environmental Department  
Hazardous Waste Bureau  
2905 Rodeo Park Drive East, Building 1  
Santa Fe, NM 87505-6303

RE: KAFB draft Permit  
Public Notice Number 07-03  
EPA ID No. NM9570024423

Dear Mr. Kieling:

Please accept the following comments on the subject Draft Hazardous Waste Permit. Our comments relate to the proposed treatment of the existing 21-inch Tijeras Phase II Interceptor (Interceptor) that crosses KAFB Landfill 2 (LF-002). Paragraph 5.2.4 of the Draft Facility Operating Permit dated April 16, 2007 states "The sanitary sewer line that passes through LF-002 shall be removed in accordance with the Department's instructions (letters from NMED to Carl Lanz: July 16, 2004; September 13, 2004; and March 10, 2005). The NMED approval letter dated September 13, 2004 for the Corrective Measures Design and Implementation Work Plan states "The Tijeras Sewer Interceptor shall be rerouted such that no active portion of the pipeline remains within or is located within 100 (one hundred) feet of the landfill. The abandoned portion of the Tijeras Sewer Interceptor shall be drained; its contents disposed of in a manner that meets all applicable laws and regulations."

Protection of groundwater is extremely important. We understand that relocating an existing sewer which runs through a landfill would seem to be the proper approach to protect groundwater. However, we have carefully studied the situation and we believe that the Draft Permit requirement to relocate the sewer is counterproductive to groundwater protection and the proper approach is to monitor the pipe and make repairs if any are required. We base this contention on the following three key points:

1. The sewer is in excellent condition. The sewer design provided for means to properly construct the sewer within the landfill and recent inspection shows that this line is performing extremely well, proving the design and construction were properly done.
2. Relocating the sewer endangers the groundwater.
3. The cost of relocating the sewer will divert funding from other projects that will better protect the groundwater.

The following comments will expand on the key points listed above.

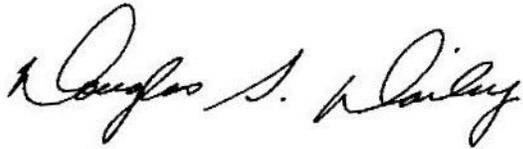
1. The existing Interceptor is in excellent condition.
  - a. Based on closed circuit television (CCTV) inspections, there are no indications of current problems with the pipe line, leakage or otherwise. The Interceptor has been independently inspected twice in the last four years and no defects have been found. Both inspections were performed by an independent consultant contracted to KAFB.
  - b. We recognize the concern caused by failures in downstream portions of the Tijeras Interceptor. These failures were in the concrete portion of our sewer system and were caused by biologically occurring sulfuric acid that reacts with and destroys concrete pipe.
  - c. The Tijeras Interceptor Phase II was constructed with Vitrified Clay Pipe (VCP), a different pipe material that is impervious to sulfuric acid corrosion.
  - d. We recognize the impact sulfuric acid corrosion has on our system and are working diligently to rehabilitate the concrete pipe portion of our system, preferably before collapse.
2. The sewer was carefully studied by an independent consultant contracted by KAFB. The recommendation was to “leave the existing 21-inch VCP in place and continuing to monitor for future signs of distress.”
3. This Interceptor is anticipated to have an extremely long useful life. Useful life is based on the performance of the asset and the condition of the asset, and is not based on an arbitrary number of years the asset has been in service.
  - a. This concept of “useful life” is promoted by the USEPA in their training entitled, “Advancing Asset Management in Your Utility: A “Hands-On Workshop.” This training is presented across the country and has been presented for many years. Recently, the ABCWUA was the sponsor for this two-day workshop in Albuquerque.
  - b. In this Workshop, the USEPA contends that an asset’s life is not dictated by a specific “design life” in terms of years.
    - i. As an alternative, the asset has reached the end of its useful life when it has failed via one of four mechanisms, as follows:
    - ii. Capacity – The asset no longer has the physical size; the asset is not capable of meeting the capacity demands (may occur due to growth)
    - iii. Level of Service – The asset is not able to provide the requirements the system places on it (may occur if the noise, odor, or other conditions are not acceptable)
    - iv. Mortality – The consumption of the asset reduces the performance below an acceptable minimum level (may occur due to physical degradation)
    - v. Efficiency – The performance of the asset may be fine, but the cost of operation exceeds that of other alternatives (may occur if the cost of repair exceeds the cost of a new asset)

- c. As long as the asset has not deteriorated due to one of the conditions above, the asset is considered to be within its useful life and should remain in service.
  - d. To determine if the asset has met any of the failure mechanisms above, the asset is periodically reviewed in terms of performance and periodic condition inspection. The condition can be plotted on an anticipated “asset decay curve” to estimate how much useful life the asset has. Where the asset is on the decay curve is not based on the age of the asset, but rather the condition of the asset.
  - e. Theoretically, if a Facility shows no significant deterioration approaching failure and none of the other three failure mechanisms have occurred or approaching occurrence, the Facility will remain in service infinitely.
4. The Interceptor pipe material and construction methods are the best available.
- a. The landfill was recognized at the time of design and the design accounted for the landfill.
    - i. The trench removed and disposed of the landfill under the pipe and to each side. This removal was made below the bottom of the landfill. See the attached excerpt from the record drawing.
    - ii. High quality bedding was provided that will provide a high degree of support to the installed pipe. As verified through video inspections, settling of the pipe is not noted, confirming the high quality of construction.
  - b. The pipe material is Vitrified Clay Pipe (VCP), which is an extremely high quality material and is the best available for this application.
    - i. Please see the attached letter from the National Clay Pipe Institute.
    - ii. We will let this letter speak for itself, but note that in it Mr. Michael VanDine, PE, President of the National Clay Pipe Institute notes that VCP has performed for thousands of years and that VCP defects are expected within the first two years after construction.
5. No credible failure mechanisms related to Mortality exist for the Interceptor.
- a. The characteristics of VCP are such that the following failure mechanisms are anticipated:
    - i. Damage during construction.
    - ii. Settling caused by poor bedding.
    - iii. Damage by contractors installing other utilities.
  - b. None of these failure mechanisms apply to this installation.
6. Sewer inspection technology has rapidly improved and the pipe condition can be ascertained with even more accuracy than was previously possible.
- a. A combination inspection consisting of closed circuit television (CCTV), laser and sonar is now available. Through this process interior pipe conditions below and above the water surface can be evaluated.
  - b. Please note the NCPI opinion that VCP cracks will propagate above the water surface and therefore be detectable. The lack of observable cracks is therefore proof that cracking has not occurred.

7. Interceptor leakage would be of low impact and would be detectable at the next inspection.
  - a. The only credible cracking of the Interceptor would be small and would allow negligible leakage. The installed bedding is gravel that will allow significant leakage to flow down by gravity to the minimum 10-foot wide by six-inch deep bedding area below the landfill. This will allow percolation of substantial Interceptor leakage prior to overflow into the landfill.
  - b. This cracking would be detected at the next inspection cycle.
8. Trenchless no-by-pass repairs are commercially available in the event that a crack and leak occurred, both anticipated to be very small. An example is the MaxPatch point repair system in which a carrier within the interceptor would allow repair while the flow continued. Alternate approaches such as epoxy packing, again with carrier allowing flow through, would be considered at the time repair is required.
9. While the existing sewer is not an imminent threat to the environment, the realigned sewer will have environmental concerns during the process of constructing the realigned sewer. Construction phase concerns include:
  - a. Removal of the pipe may disturb some of the existing landfill.
  - b. We may run into currently unknown landfill, requiring a progressive realignment of the sewer during the construction phase, degrading the constructed product and escalating the costs.
  - c. Sewage spills may occur during the construction.
  - d. By-pass pumping will be required to connect the realigned sewer on each end. By-pass pumping operations are by their nature difficult and can experience significant spills.
    - i. The by-pass piping will be approximately 3000' long, if this can be laid over the landfill.
    - ii. If the by-pass piping cannot be laid over the landfill:
      1. Constructability issues may require the by-pass piping to be run south of the landfill, needing an additional 3000' and laying across the active portion of the Tijeras Arroyo.
      2. If the force main can be run to the north, any spill will cross the landfill.
10. Our rate payers expect their funds to be spent in the most effective manner possible. We strive in our work to maximize protection of the environment. Examples of efforts that may face reduced funding to realign this sewer include:
  - a. The environment will be better served by spending funds to extend service to areas that currently do not have sewer service.
  - b. We are recognizing the need for increased funding to rehabilitate deteriorating concrete sewers in advance of potential collapses. This will help us prevent repeats of the collapsed sewer downstream of Landfill LF-002.

We request the opportunity to present and discuss the above information with you. We request that a part of your review be by a registered Professional Engineer. We look forward to working with you in protecting the environment.

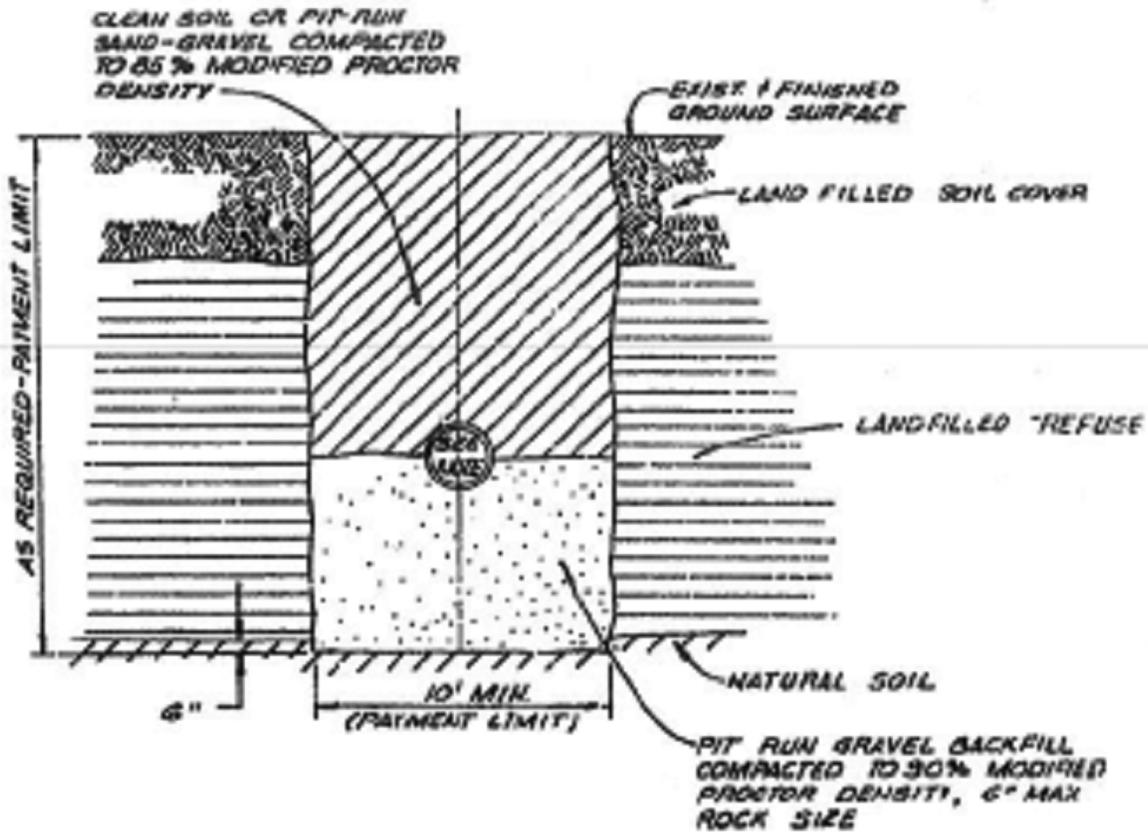
Sincerely,

A handwritten signature in black ink, reading "Douglas S. Dailey". The signature is written in a cursive style with a large initial 'D'.

Douglas S. Dailey, P.E.  
Wastewater Utilities Division

cc: Roy G. Robinson P.E., General Manager, ABCWUA  
Mark S. Sanchez, Executive Director, ABCWUA

# EXCERPT FROM RECORD DRAWINGS



**DESCRIPTION:**

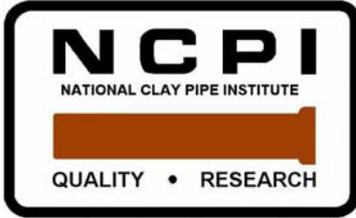
REMOVE AND DISPOSE OF ALL SOIL COVER AND LANDFILLED REFUSE TO THE NATURAL SOIL LEVEL. PLACE AND MANNER OF DISPOSAL MUST BE APPROVED BY THE OWNER. THE CONTRACTOR SHALL FURNISH ALL BACKFILL MATERIAL AS SHOWN

**NOTE:**

PIPE TO HAVE CLASS A BEDDING (NOT SHOWN IN DETAIL) IN ACCORDANCE WITH ASTM C-12

**SANITARY LANDFILL CROSSING DETAIL**

NO SCALE



National Clay Pipe Institute  
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Lake Geneva, Wisconsin 53147  
262-248-9094, fax 262-248-1564  
Ncpi@genevaonline.com

June 14, 2007

Mr. Mark Holstad  
City of Albuquerque  
Albuquerque, New Mexico

Re: KAFB Landfill (LF-002)

Mr. Holstad,

Thank you for allowing me to comment on the Tijeras Sewer Interceptor at KAFB. I will be commenting on videos I have reviewed and the report provided by CH2MHill on the condition and potential longevity and performance of the line that is in place.

### **Video Analysis**

Detailed review of the video provided for manhole runs 11 through 17 gave me only one indication that is of any concern. In the video of the run from manhole 12 to manhole 11 there was an interesting white deposit at the crown of the pipe at 177.3 ft. as indicated in the display. This is really a very minor spot and not of any real consequence to the performance of the system especially since it is not within the boundary of the landfill. The line is in excellent condition.

### **CH2MHill Report**

I was impressed by the thorough report provided by CH2MHill. Many potential concerns were raised and addressed. I found their calculations to be conservative but accurate. I would like to expand just a little on the nature and characteristics of Vitrified Clay Pipe to alleviate any concerns related to this line and its continued performance.

The general concerns I was able to identify are listed below;

Longevity and durability of Vitrified Clay Pipe,  
Joint performance and integrity, and  
Potential Structural failure.

### **Longevity and Durability**

The concern of the installed clay pipe being near the end of its design life is not accurate. Vitrified Clay Pipe is one of the only materials that have been used for over 4000 years in civil engineering. It has been installed in the United States for over 150 years. Systems over 100 years old are in service in municipalities across the country. The Army Corp of Engineers stated it this way;

“Clay Pipe is perhaps the most inert of the common pipe materials in terms of corrosion, and it is very resistant to abrasion. A 100-year service life may be assumed for most clay pipe installations.”

From “Life Cycle Cost for Drainage Structures”, US Army Corps of Engineers.

Vitrified Clay Pipe was given the longest life cycle of all the materials discussed in this report. The Canadian National Research Council's Institute for Research in Construction (**IRC**), recently stated that the service life for Vitrified Clay Pipe was 130 years. Clay Pipe was also the highest rated material in this study.

### **Joint Performance and Integrity**

Clay Pipe joints have been designed not to leak. ASTM standard C 425 requires that the joint not leak in factory testing. This joint design and performance criteria have been used since 1965. Since this system was installed in 1977, the current ASTM C 425 Standard would have applied to this line. Based on the videos that I have reviewed, there appears to be no leaking at the joints and no bedding migration into the pipe. I will send a copy of a recent report by the University of Houston that discusses the performance of modern clay pipe joints. This report is based on the same joints used on this system and found that this type of joint does not leak.

### **Structural Failure Modes**

Clay Pipe is a rigid conduit. As such, cracking is the primary failure mode. Clay pipe will fail in tension not typically compression. As a result, cracks will occur in the crown first then the invert and finally at the springline of the pipe. It would be extremely unlikely that the invert of a pipe would break below the waterline without

also seeing visible distress at the crown. In all of the testing and analysis that NCPI has done over the years, the crown is the first area of the pipe to show a crack. In my seven years with the industry and after reviewing all the research on failure modes done in the last 20 years a crack in the invert would be proceeded by a crack in the crown. The videos showed no evidence of any breakage in the crown and as a result, experience dictates there are no cracks in the invert.

Clay Pipe has and will continue to perform for well beyond 100 years. The line I saw was already thirty years old and in excellent condition. Any defects that where the result of construction or foundation/bedding issues typically become evident during the first two years as the soils completely consolidate. We are well past that threshold with this system. There is no reason to expect that the work done above this line will compromise the integrity of the system.

Thank you so much for including me in this discussion. If I can be of any further assistance, please call.

Sincerely,

A handwritten signature in black ink that reads "Michael VanDine". The signature is written in a cursive style. To the right of the signature is a vertical red line.

Michael VanDine, PE  
President  
National Clay Pipe Institute  
Lake Geneva, Wisconsin  
262-248-9094