



United States Department of the Interior
NATIONAL PARK SERVICE
Bandelier National Monument
15 Entrance Road
Los Alamos, New Mexico 87544-9508



IN REPLY REFER TO:
N1423(BAND)

Memorandum

To: Management Staff, BAND

Through: Chief of Resources, BAND

From: Park Botanist, BAND

Subject: Legacy DDT Contamination in Frijoles Canyon

Rito de Frijoles – Water Quality:

In a 2004 surface water quality report assessing conditions within the upper Rio Grande drainage network the New Mexico Environment Department concluded that "The Rito de los Frijoles was the most impaired waterbody in this watershed and is impaired due to temperature, dichlorodiphenyltrichloroethane (DDT), fecal coliform and turbidity" (NMED/SWQB 2004). The New Mexico Water Quality Control Commission (1998) continues to list Frijoles Creek as "partially supporting" designated uses as a result of pesticide contamination from past land disposal practices.

Overview on DDT:

For several years in the 1950's park staff sprayed DDT to control tent caterpillar infestation of the Cottonwood bosque riparian corridor within the main headquarters and visitor use area of Frijoles Canyon. Mixing of chemicals and cleanup within the Maintenance Yard discharged DDT directly to the Rito de los Frijoles and contaminated soils, aquatic invertebrates, and fish. The contaminated site, including the maintenance yard location where mixing and clean-up occurred and the adjacent riparian bosque were characterized in the early 1990's to determine the extent and level of contamination. The investigation found persistent levels of DDT but with the exception of five hotspots determined that these were below thresholds that posed a risk to human health.

In addition, the ratio of DDT to breakdown products suggested bioremediation was proceeding at a relatively slow rate. Based on the results of this investigation the park prepared a 1996 DDT Environmental Assessment (EA) which recommended no additional action beyond maintaining a ban on fishing, posting the affected portion of the bosque, and select minor management actions. However, representatives of several New Mexico State agencies engaged as part of the EA review process were uncomfortable with the no action recommendation and preferred instead that the park test and remediate the remaining five hotspots. The park completed a final 1995 DDT EA but never issued a FONSI on the selected “No Action” alternative, and the issue has remained dormant for almost 20 years.

Given the passage of time it was deemed prudent for the park to revisit this legacy contamination issue by retesting (including remediation if necessary) the hotspot areas as well as assessing current levels of DDT in representative fish tissue. These new data and remediation actions should allow park management the opportunity to review existing closures as well as to consult with state officials and potentially close out this long standing issue.

Management Decisions Established Under the 1996 DDT EA:

- Remediation of the DDT-T contaminated soils or sediments is not warranted on the basis of ecological risk, potential human health impacts, or the direct risk to significant cultural resources;
- Remediation of DDT-T contaminated soils in the historic gutter along the entrance road is not warranted. Normal maintenance of the gutter should be reinstated to remove the accumulated soils and return the gutter to serviceable condition. This will ensure that no cumulative, significant, indirect impacts will occur to this historic resource;
- Because the DDT-T contaminated soils do not require remediation and no health risks are posed, the existing exclusion of the public from the area near the sumps is no longer necessary; and,
- In addition, Ecology and Environment, Inc., recommended that the current "ban on fishing within the Monument would seem to be proper assuming a preventative public health approach."
- Management of other contaminants, such as in parking lot runoff, as well as establishing safe handling practices for hazardous chemicals in use by park staff, should be undertaken.

Recommended Current Program and Justification:

- ACTION 1. Re-evaluate sediments in previously sampled areas near the maintenance facility and re-sample fish tissue in the stream reach above and below the contaminated site to assess presence and relative levels of DDT and breakdown products. (PMIS 176850 Re-assess legacy DDT contamination in Frijoles Canyon.)
 - ✓ Up to 40 soil samples will be collected with hand auger equipment from surface and near-surface soil horizons (within 1 foot of the surface) within previously detected hot spot areas and will be submitted for analysis of DDT content via USEPA Method 8081A at a licensed analytical laboratory.

- ✓ DDT levels have been documented in the maintenance area of the park and in the tissue of fish in Frijoles Creek. Park construction projects in this area are subject to potential significant limitations due to the soil impacts, while fishing has been banned in Frijoles Creek. There has been no regulatory closure to this project which has been “open” for almost 20 years. A reassessment of conditions is necessary to determine proper closure actions and to confirm the continued relevance of the repeal of the ban on fishing in Frijoles Creek.
- ✓ The recommended program would generate sufficient information/data to develop proper closure actions for a longstanding environmental issue and will provide necessary information to determine if continued restrictions on fishing and/ or consumption are warranted. The sampling will be designed based on the data provided in the RHOMBUS, Inc. report outlining the DDT hot spots determined during the 1995 field investigation.
- ACTION 2: Implement recommendations from the 1995 EA that are still relevant, including installation of an oil/water separator for parking lot run-off, and remove irrelevant signs from within DDT Area C.
 - ✓ Introduction of an oil/water separator might be included as appropriate in future infrastructure projects, such as any project associated with transportation or landscape improvements in the parking lots.

Current Status

Monument managers have followed the EA recommendations by improving the drainage system in the contaminated area to minimize movement of contaminated soil into Frijoles Creek, and by removing soil and an old wooden bumper in small, highly contaminated areas. They have also maintained the ban on fishing from Alcove House (Ceremonial Cave) to the Rio Grande until the edible flesh of fish from the stream is less than the reported EPA threshold level of 5 ppm (National Park Service, 1996a). The most recent fish sampling conducted by the USGS (Carter, 1997b) found rainbow trout downstream of the headquarters area to be significantly less than the EPA level at only 0.1786 ppm DDT-T. However, managers prudently believe a larger and more systematic sampling is needed before the fishery is reopened (National Park Service, 1996b).

**Electronic copies of the 1995 DDT investigation report and 1996 environmental assessment can be found on the Bandelier intranet public drive.(P:/NEPA and Permits/1996 DDT EA)*

Figures:

Figure 1. Map of Areas 1, 2, & 3 delineated in the 1995 Rhombus DDT investigation report as potentially contaminated (Area A) or contaminated (Areas B and C) due to DDT use by park staff in the 1950s. Maintenance Yard stone wall represents the boundary between Areas 1 & 2. The wall was identified in the report as a contaminated site feature.





Figure 2. Culvert warning signage along park Entrance Road right-of-way. This is an example of a sign that may be removed based on decisions in the 1996 DDT EA.



Figure 3. Implementation of Environmental Assessment remedial action #1 'construct an open stone culvert'. This is an example of completed work under the 1996 DDT EA.