

APPENDIX 2

A-2. ELK RUN/DEAKIN RUN

A-2.1 Watershed Information

Elk Run/Deakin Run is located in the western part of the North Branch/Potomac River watershed (Figure A-2-1). The Elk Run/Deakin Run watershed is in Grant County between Kempton Junction and Henry on the Davis, West Virginia USGS 7.5 minute topographic map. Originally, Elk Run was a direct tributary of the North Branch Potomac; however, because of mining activities, Elk Run was rerouted to join Deakin Run (Figures A-2-2, A-2-3 and A-2-4) just downstream of a large pond and wetland.

The dominant land use in the watershed is forest, which covers 82.1 percent of the watershed. Other important land use types include pasture (9.4 percent) and barren/mining land (3.3 percent). All other individual land cover types account for less than 5.2 percent of the total watershed area. Elk Run is the only impaired stream in the watershed and it is impaired relative to the iron water quality criterion. Figure A-2-5 shows the impaired segments and the pollutants for which each is impaired. Figure A-2-4 shows the rerouted portion of Elk Run adjacent to the refuse pile.

Before establishing Total Maximum Daily Loads (TMDLs), WVDEP monitored each of the impaired streams in the North Branch/Potomac River watershed to characterize water quality and refine impairment listings. Monthly samples were taken at two stations in Elk Run. From July 1, 2002, through June 30, 2003, Elk Run was monitored at its mouth and at mile point 1.7 for total iron, dissolved iron, total aluminum, dissolved aluminum, total suspended solids, selenium, pH, sulfate, and specific conductance. A benthic macroinvertebrate assessment was performed at the mouth of the stream.

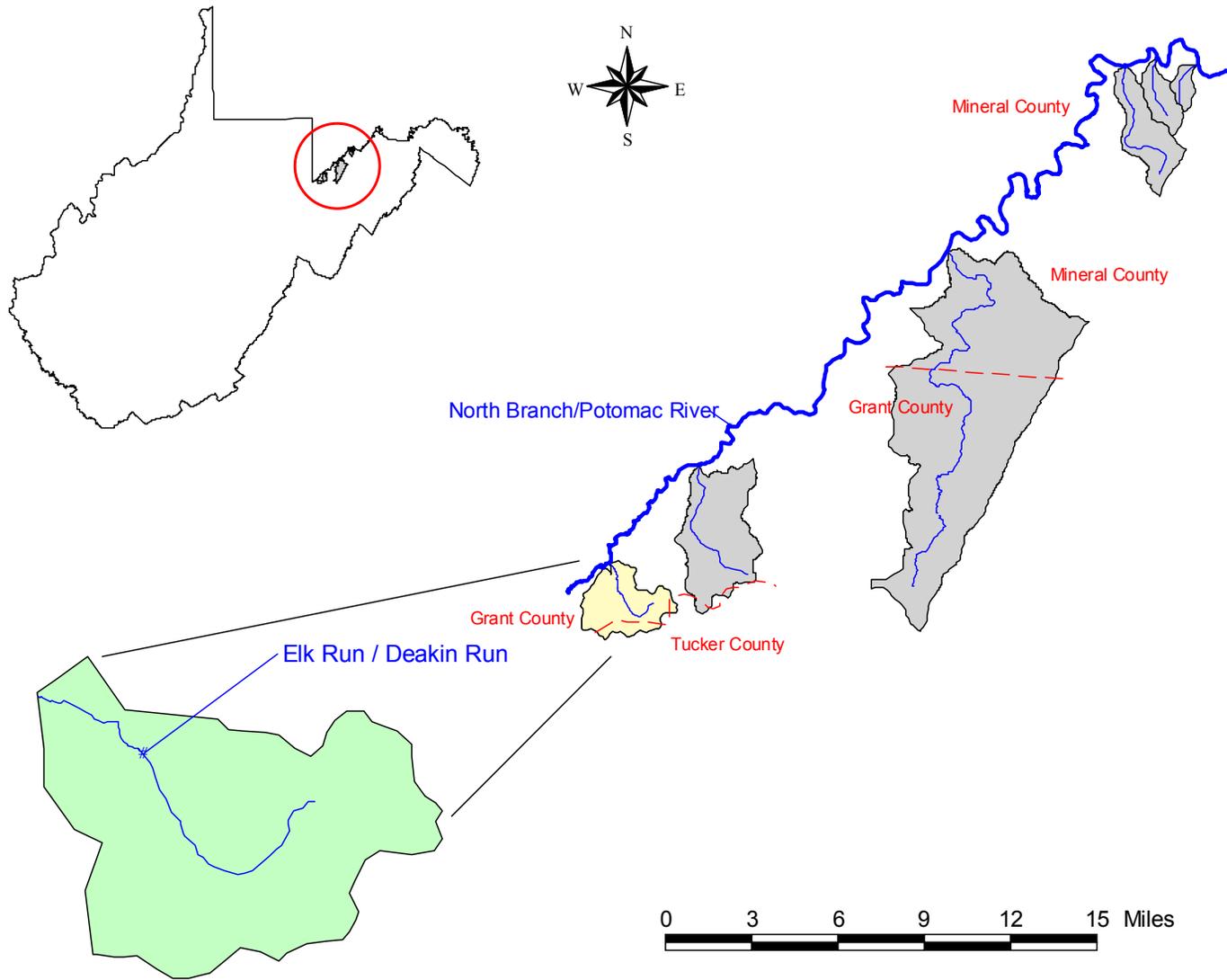


Figure A-2-1. Location of the Elk Run/Deakin Run watershed.



Figure A-2-2. Large refuse disposal area in the vicinity of the original Elk Run stream channel.



Figure A-2-3. Rerouted Elk Run separated by embankment from Deakin Run pond/wetland area. Elk Run joins Deakin Run below pond/wetland area.



Figure A-2-4. Rerouted Elk Run adjacent to the refuse disposal area.

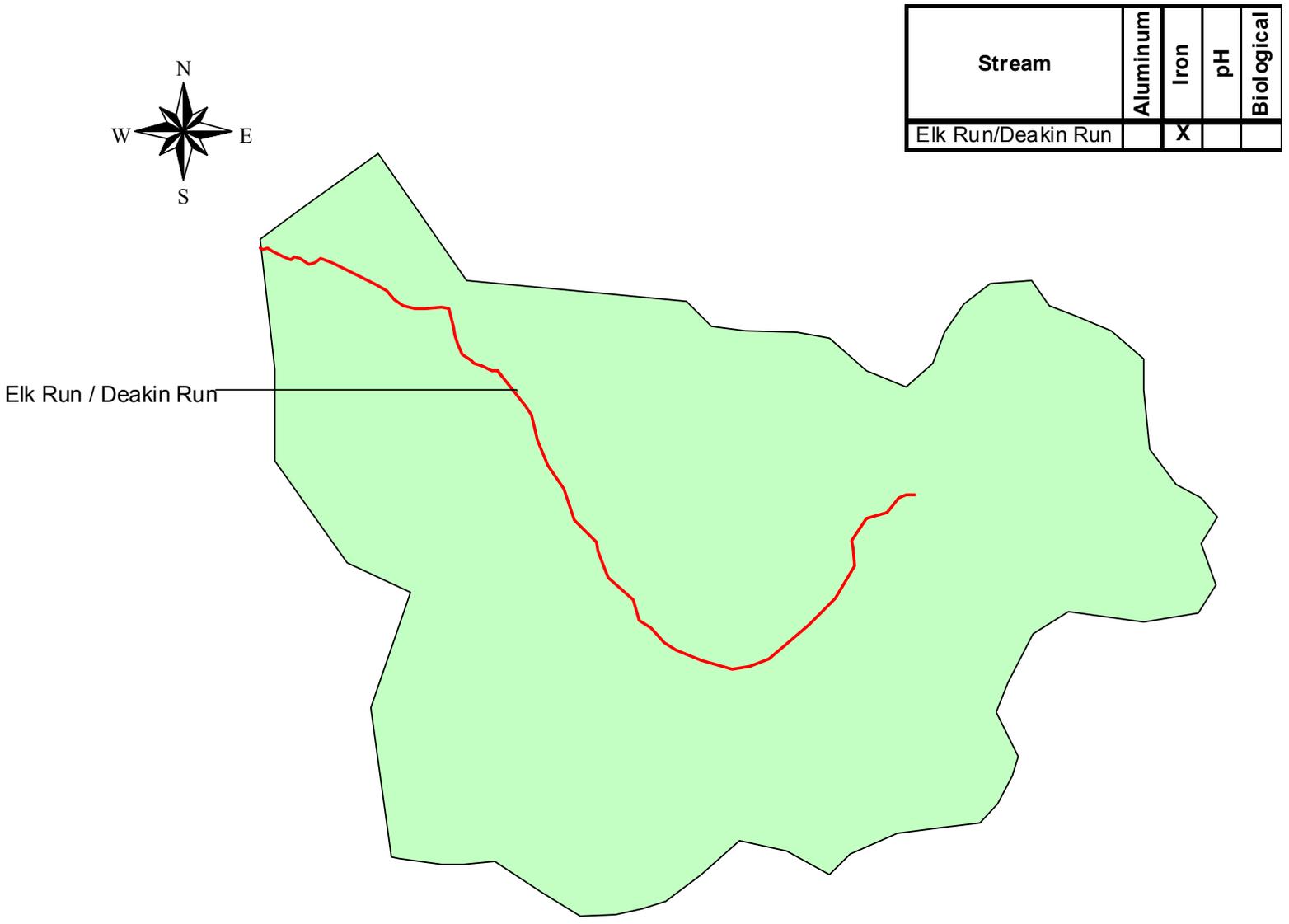


Figure A-2-5. Impaired waterbodies in the Elk Run/Deakin Run watershed.

A-2.2 Metals and pH Sources

This section identifies and examines the potential sources of iron impairment in Elk Run. Sources can be classified as either point sources (specific sources subject to a permit) or nonpoint sources (diffuse sources). Mining and non-mining related permits are considered metals point sources. Nonpoint sources are diffuse, non-permitted sources such as abandoned or forfeited mine sites.

Pollution sources were identified using statewide geographic information system (GIS) coverages of point and nonpoint sources, and through field reconnaissance. As part of the TMDL process, WVDEP documented pollution sources by describing the pollution source in detail, collecting Global Positioning System data, and if necessary, collecting a water quality sample for laboratory analysis. WVDEP personnel recorded physical descriptions of the pollutant sources, such as the number of outfalls, the source of the outfalls, and the general condition of the stream in the vicinity of each outfall. These records were compiled and electronically plotted on maps using GIS software. This information was used in conjunction with other information to characterize pollutant sources. Significant metals sources in the watershed are shown in Figure A-2-6.

A-2.2.1 Metals Point Source Inventory

As described in the main report, the National Pollutant Discharge Elimination System (NPDES) program, established under Clean Water Act sections 318, 402, and 405, requires permits for the discharge of pollutants from point sources. Metals and pH point sources can be classified into two major categories: permitted non-mining point sources and permitted mining point sources. In Elk Run, there are 2 mining-related NPDES outlets. The permits related to these outlets are listed in the Technical Report, which shows the name of each responsible party and the total number of outlets that discharge to the Elk Run/Deakin Run watershed. The Technical Report also contains specific data for each permitted outlet (including effluent type, drainage areas, and pump capacities) and permit limits for each of the mining-related NPDES outlets.

A-2.2.2 Metals Nonpoint Source Inventory

In addition to point sources, nonpoint sources may also contribute to the iron impairment in the Elk Run. Nonpoint sources are diffuse, non-permitted sources. Abandoned mine lands and facilities that were subject to the Surface Mining Control and Reclamation Act of 1977 and forfeited their bonds or abandoned operations can be a significant non-permitted source of metals. Non-mining land disturbance activities can also be a nonpoint source of metals, causing metals to enter waterbodies as a component of sediment. Examples of such land disturbance activities are agriculture, forestry, oil and gas wells, and the construction and use of roads. The applicable land disturbance activities in the Elk Run/Deakin Run watershed are discussed below.

Abandoned Mine Lands and Bond Forfeiture Sites

Based on the WVDEP's Office of Abandoned Mine Lands information, abandoned mining activities were not identified in the Elk Run/Deakin Run watershed.

WVDEP's Division of Land Restoration, Office of Special Reclamation, provided bond forfeiture information and data. This information included the status of both land reclamation and water treatment activities. Bond forfeiture sites are not present in the Elk Run/Deakin Run watershed.

Land Disturbance Activities

Based on the GAP 2000 land use coverage, there are approximately 193 acres of pasture/grassland that comprises 9.4 percent of the land use in the Elk Run/Deakin Run watershed. There is one active logging operation in the watershed. The disturbed area associated with this operation is estimated to cover 15 acres (0.7 percent) of the total watershed area. Active oil and gas wells are not present in the watershed. The length and area of paved roads were calculated using the Census 2000 TIGER/Line files roads coverage for West Virginia. Information on unpaved roads from TIGER was supplemented by digitizing any unpaved roads on topographic maps that were not included in the TIGER shapefile. There are 6.04 miles of paved roads and 11.66 miles of unpaved roads in the Elk Run/Deakin Run watershed. Land disturbance nonpoint sources of iron are not significant in relation to the iron impairment of Elk Run.

Source tracking efforts confirmed that Elk Run is rerouted from its original channel around a large refuse disposal area. This rerouted portion of Elk Run flows parallel to the pond/wetland area on Deakin Run and eventually joins Deakin Run below the pond/wetland area. The iron impairment in Elk Run has been attributed to seepage from the refuse disposal area permitted under SMCRA Permit No. O-130-83. Iron oxide was observed in Elk Run in the vicinity of the refuse disposal area. DEP's monthly monitoring stations bracket the disposal area, and the observed instream iron concentrations are elevated at the downstream location.

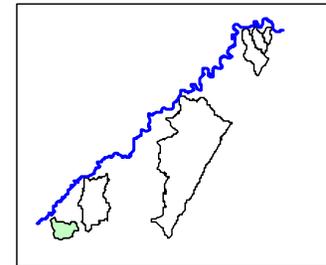
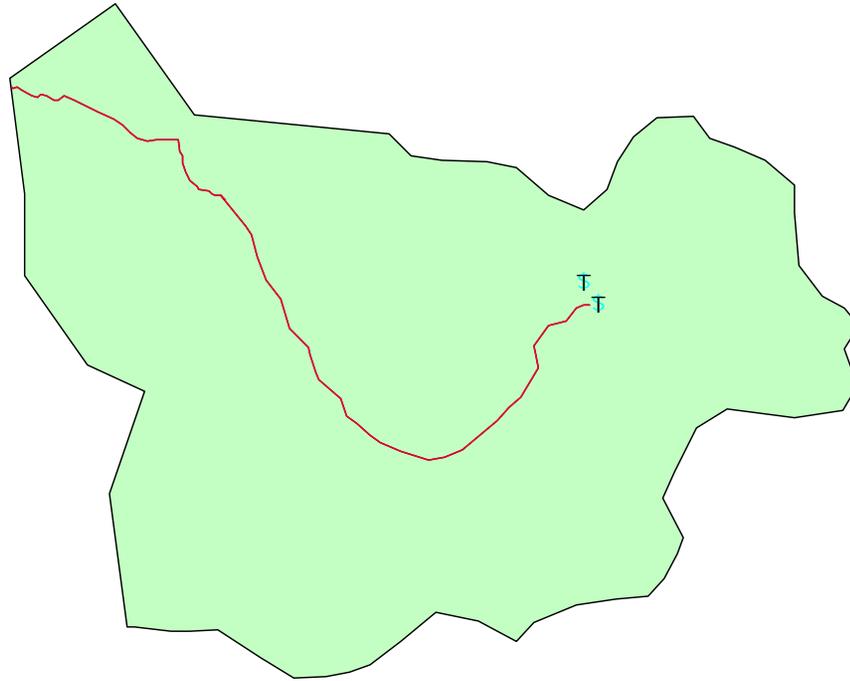


Figure A-2-6. Metals sources in the Elk Run/Deakin Run watershed.



Figure A-2-7. Elk Run adjacent to the refuse disposal area, iron oxide coating present in the stream bottom.

SMCRA Permit No. O-130-83 has no associated WV/NPDES outlets that discharge into the modeled segment of Elk Run. Historically, the impact of the seepage was much more severe and the permittee installed a series of sumps and pumps to lower the phreatic surface in the refuse below stream level, capture the seepage, and pump it outside the watershed for treatment. The collection and transport system remains in operation.

While the present impact of the seepage is less severe, its iron loading causes Elk Run to exceed water quality criteria. The WVDEP Division of Mining and Reclamation is aware of the situation and will direct corrective actions to resolve the impairment. As there is no point source discharge into Elk Run, this TMDL does not grant a wasteload allocation for the refuse disposal area.

A-2.3 Stressors of Biologically Impaired Streams

WVDEP sampling results did not indicate that Elk Run/Deakin Run were biologically impaired. Therefore, biological TMDLs were not developed for this watershed.

A-2.4 TMDLs for the Elk Run/Deakin Run Watershed

A-2.4.1 TMDL Development

TMDLs and source allocations were developed for impaired streams in the Elk Run/Deakin Run watershed. A top-down methodology was followed to develop these TMDLs and allocate loads to sources. Headwaters were analyzed first because they have a profound effect on downstream water quality. Loading contributions were reduced from applicable sources for these waterbodies and TMDLs were developed. Refer to Section 6.4 of the main report for a detailed description of allocation methodologies used in the development of the pollutant-specific TMDLs.

The TMDL for iron is shown in Tables A-2-1. This TMDL is presented as an annual average load, in terms of pounds per year. All TMDLs are presented as average annual loads because they were developed to meet TMDL endpoints under a range of conditions observed throughout the year.

A-2.4.2 TMDL Table: Metals**Table A-2-1.** Iron TMDL for the Elk Run/Deakin Run watershed

Major Watershed	Stream Code	Stream Name	Metal	Load Allocation (lb/yr)	Wasteload Allocation (lb/yr)	Margin of Safety (lb/yr)	TMDL (lb/yr)
Elk Run/Deakin Run	PNB-22-A	Elk Run/Deakin Run	Iron	668	19,840	1,079	21,588