United States Department of the Interior
NATIONAL PARK SERVICE
Buffalo National River
402 N. Walnut, Suite 136
Harrison, AR 72601

IN REPLY REFER TO
1.A.2

March 16, 2016

Becky Keogh
Director
Arkansas Department of Environmental Quality
5301 Northshore Drive
North Little Rock, AR 72118-5317

REFERENCE: Arkansas 2016 list of impaired streams, 303(d) list

Dear Director Keogh:

Natural resource staff at Buffalo National River has recently conducted an analysis of the Big Creek Research and Extension Team (BCRET) water quality data. Two stations of particular interest are on the main stem of Big Creek, Newton County, above its confluence with the Left Fork of Big Creek. Analysis of this data indicates that this reach of stream, Headwaters Big Creek, [12-digit Hydrologic Unit Code (HUC12) 110100050302] was impaired for *Escherichia coli* (*E. coli*) bacteria based upon Regulation 2.507 during the primary contact period of May 1 to September 30, 2014. According to the Arkansas Water Information System, this HUC12 has an area of approximately 45 square miles, making this segment of Big Creek a Primary Contact Stream. The BCRET sites BC 6 and 7 (Figure 1) are located on the main stem of Big Creek within this segment, topographically upstream and downstream, respectively, of the C&H Hog Farm, Inc. facility and manure spreading fields.

Assuming that Big Creek is not part of an Extraordinary Resource Water, Ecologically Sensitive Waterbody, or Natural and Scenic Waterway (ERW, ESW, or NSW) the upper *E. coli* limit is 410 colonies per 100 ml (410 col/100ml). Data from BCRET, during the primary contact period in 2014, shows *E. coli* exceeded 410 col/100ml in six of twenty-two samples for a 27% exceedance. According to Regulation 2.507, for assessment of ambient waters as impaired by bacteria, the *E. coli* standard shall not be exceeded in more than 25% of samples in no less than eight samples taken during the primary contact season.

The regulations enacting the Federal Clean Water Act appear to take a more conservative approach to Outstanding National Resource Waters (ONRW) [40 CFR§131.12(a)(3)] which streams are analogous to ERW, WSW, and NSW streams. Buffalo National River certainly meets the criteria as an ONRW. 40 CFR indicates that the watershed of ONRWs is part and

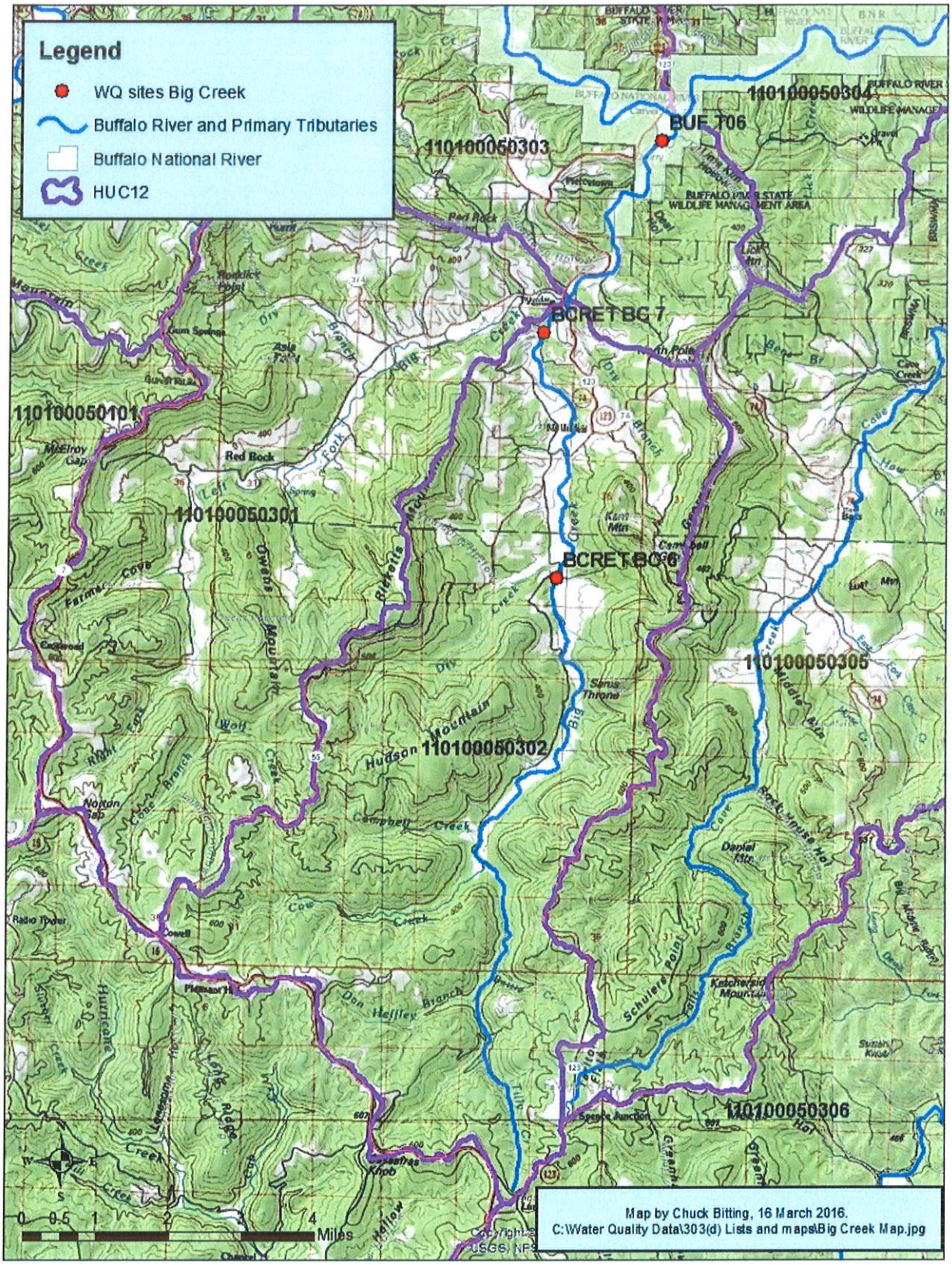

Figure 1. Map of Big Creek HUC 110100050302 showing site locations for BC 6, BC 7 and BUFT06.

parcel with the ONRW itself, and strongly encourages watershed protection for maintenance and protection of the ONRW. Taking this more conservative approach to *E. coli*, the standard for Big Creek should be 298 col/100ml for an individual sample and 126 col/100ml for a geometric mean of at least five samples over a 30-day period.

During the primary contact period of 2014, BCRET Station BC 6 exceeded 298 col/100ml in eight of twenty-two samples for a 36% exceedance. Also, during the primary contact period there were three periods when the geometric mean was exceeded. These were: May 13 through June 9, 2014 when the geometric mean was 339 col/100ml; June 19 through July 15, 2014 when the geometric mean was 783 col/100ml; and August 20 through September 18, 2014 when the geometric mean was 146 col/100ml.

BCRET BC 7 is a station on the main stem of Big Creek downstream of the C&H Hog Farm, Inc. facility and manure spreading fields. During the primary contact period in 2014, the stream exceeded 410 col/100ml in seven out of twenty-two samples for a 32% exceedance of the standard. The stream exceeded 298 col/100 ml in seven out of twenty-two samples for a 32% exceedance of the ERW standard. The stream had two periods where the ERW geometric mean was exceeded. These were: May 13 to June 9, 2014 with a geometric mean of 283 col/100ml and June 24 to July 23, 2014 with a geometric mean of 697 col/100ml.

To further corroborate the BCRET observations from the Headwaters Big Creek hydrologic unit further down the system at ADEQ monitoring site BUFT06, data were collected by Buffalo National River within the park's boundary. *E. coli* concentrations were also elevated during the primary contact period in 2014, similar to the BCRET observations. Geometric means (five samples within a 30-day period) of *E. coli* concentrations observed two months above 126 col/100ml during that same time (Figure 2). Although the causality linkages between the *E. coli* concentrations at the BCRET sites and within the park are not fully documented, the similarity in timeframe and exceedingly high concentrations of *E. coli* at all sites during this primary contact period clearly shows the connectivity of the watershed, and what happens within the headwaters directly impacts the quality of water further downstream, in this case within the Buffalo National River. Please give this evidence strong consideration when evaluating any site within Big Creek (BUFT06) for 303(d) listing.

Data from the BCRET researchers indicate that Big Creek is indeed impaired for *E. coli* upstream of the Left Fork. Impairment of that segment can also lead to impairment within the national river as shown in our data for *E. coli* at BUFT06. *E. coli* contamination of the Buffalo River and its tributaries adversely and directly impacts the public's ability to enjoy water-based recreation within Buffalo National River.

On a final note, during a number of email exchanges between Aquatic Ecologist Faron Usrey of my staff and Craig Uyeda and Sarah Clem of ADEQ, we noted depressed dissolved oxygen values in Big Creek. The dates of these emails are July 23 and 27, 2013 and August 6 and 27, 2013. The data and information in these emails should be added to the dataset for determination of impairment for Big Creek.

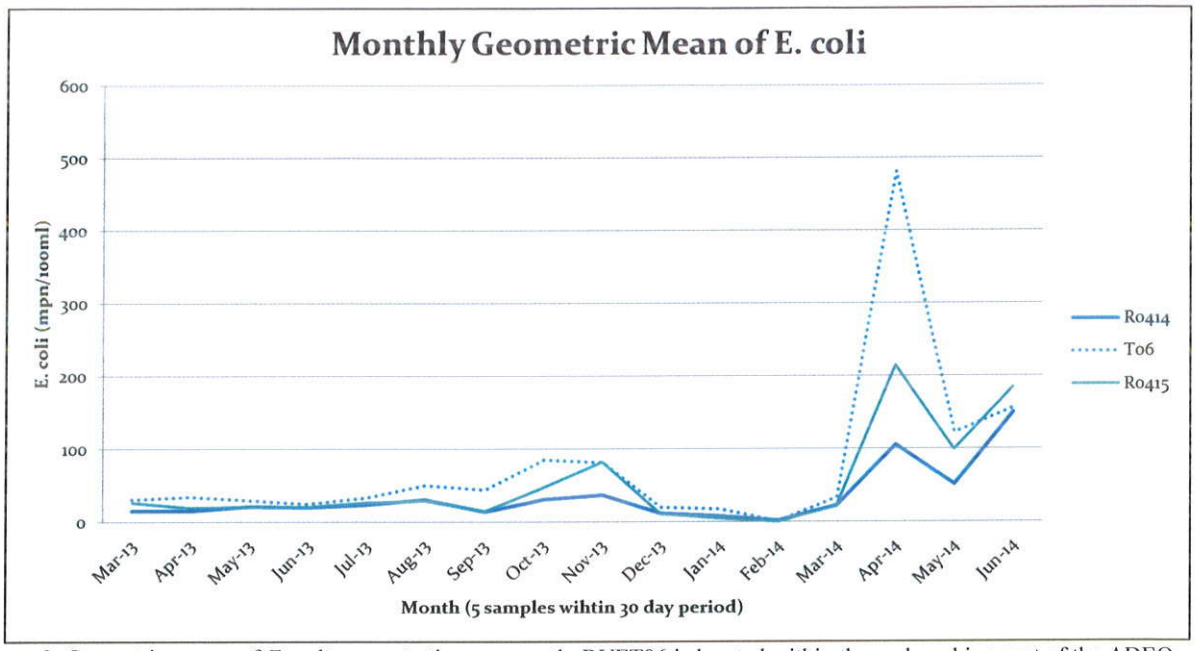

Figure 2. Geometric means of *E. coli* concentration per month. BUFT06 is located within the park and is a part of the ADEQ Water Quality Monitoring Network.

Sincerely,

Kevin G. Cheri

Kevin G. Cheri
Superintendent

Electronic Cc:
Laura Hunt, EPA, Region 6 (Hunt.laura@epa.gov)
Kane Webb, Director, Arkansas Parks and Tourism (kane.webb@governor.arkansas.gov)
Nathaniel Smith, MD, Director, Arkansas Department of Health (Nathaniel.smith@arkansas.gov)
Mike Knoedl, Director, Arkansas Game and Fish Commission (Mike.Knoedl@agfc.ar.gov)