



ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

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BRUCE RAUNER, GOVERNOR

ALEC MESSINA, ACTING DIRECTOR

Memorandum

Date: May 25, 2017
To: BOW/DWPC/FOS and RU
From: Holly Hirschert BOW/DWPC/FOS-Champaign *glngh*
Subject: Investigation of Sediment in an Unnamed Tributary to Middle Fork Vermilion River
April 26 through May 12, 2016

Around 3:20 PM on April 25, Andrew Rehn of the Prairie Rivers Network contacted me by phone. He reported that some canoers saw white sediment flowing from an unnamed tributary at an unusually high rate into the Middle Fork Vermilion River (the River). He said they were south of the Dynegy site at the time. I sent emails to Tom Davis and Phil Morris at Dynegy Midwest Generation asking about activities at the former Vermilion Power Plant site. The maps I looked at did not indicate that there was a tributary to the river near the Dynegy site. I contacted Jim Miles and asked him if I should investigate the next day. He said he would discuss this with Bill Buscher, Division of Public Water Supplies, who was the last person from the Agency to visit the site.

When I arrived at work on April 26 there was an email from Mr. Buscher with a message forwarded from Andrew Rehn. Mr. Rehn had provided a basic map that shows a stream originating in a pond near the intersection of 2100 N Road and Newtown Road. The unnamed tributary (stream) eventually flows into the River about 1.5 miles to the south and east. Figure 1 indicates the location of the stream with respect to the River. The email also contained the following information:

"They [canoers] described the flow as exceptionally high (1/8 - 1/4 of the Middle Fork), and milky white. The entire Middle Fork was turbid downstream. They said they regularly canoe the Middle Fork, so they're quite familiar with the site and said it was exceptionally high flow from the tributary."

There was also an email from Tom Davis indicating that he and Rick Diericx would be at the site at 8 AM and would investigate. Phil Morris also replied to my email saying Dynegy personnel would investigate and get back to me. I called Mr. Morris and told him I was going to check the stream beginning at Newtown Road. He provided a cell phone number for Mr. Davis.

Investigation

I drove to Vermilion County and began checking with residents who own property south of 2100 E Road and east of Newtown Road. (For a description of my activities, see the attached email). I viewed the unnamed tributary from two properties south of 2100 N Road. The flow at those locations was minimal and clear. I did not see any activities that might result in white sediment or turbidity in the stream. The majority of the properties north and south of the stream are farmland. There are several residences and areas that are not suitable for farming.

I considered visiting the Dynegy site and called Mr. Davis's cell phone at 10:53 AM. There was no answer so I left a message. Without certainty that I would be able to enter the Dynegy property, I decided against driving to the facility and returned to the office.

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When I returned from lunch, there was an email from Mr. Diericx that was sent at 12:44 PM. He asked me to call him because he was at the Vermilion site. I called the number he provided and left a voice mail message indicating that I was back in the office.

At 1:20 PM, Mr. Buscher forwarded another email from Mr. Rehn. The message included a graph of the Middle Fork Vermilion River flow for April 25. The gage is located 150 feet upstream from the Kickapoo State Park Road bridge, 1.0 miles upstream from the Interstate Hwy 74 bridge, and 2.0 miles northeast of Oakwood¹. Mr. Rehn noted that there was a surge in the flow rate of about 40 ft³/second at midday.

Later in the afternoon, Mr. Diericx returned my call. He said he and Mr. Davis had met with a contractor at the site and did not see anything unusual south of the reservoir.

After I left for the day, Mr. Rehn sent email saying, "We've had other reports noting the sediment downstream at the bridge near Kickapoo Landing."

On April 28, Mr. Rehn sent another email with a map downloaded from the Illinois State Geological Survey. That map is Figure 2. The message said,

"You all might already be aware, but there are only two main stems of that tributary, and one of them goes directly to dam at the cooling lake. It's clear from the LiDAR elevation data below. Approximately 20,000,000 gallons were released if you take the area under the flow instantaneous flow graph for the 16 hours that it seemed to be elevated. That's a lot of water, and I can't really think of any other potential source. Is there anything more the Illinois EPA can do? Our members are concerned and want an explanation."

I went to the site where Mr. Rehn obtained the map. When I removed the hillshade layer, Figure 3 was the result. There are two tributaries shown, but the location of the reservoir spillway is not clear.

Background on the Reservoir

Until the Vermilion Power Plant was shutdown in April 2011, the facility's reservoir was used to store makeup water for plant processes. After changing to a dry fly ash handling system, plant personnel maintained a low level in the reservoir to avoid discharging. Discharges were infrequent and normally occurred after heavy rainfall. On several maps, the reservoir has the label Illinois Power Company Lake because the plant was built by Illinois Power. National Pollutant Discharge Elimination System (NPDES) permit, IL0004057, limits discharges from the facility to stormwater runoff free from any other waste streams. Discharges to Outfalls 001, 002, and 003 are limited to overflows caused by precipitation events, from the North Ash Pond, the Makeup Water Reservoir, and the East Ash Pond, respectively.

Follow-up Investigation

On May 12, I met Mr. Diericx at the Dynegy security gate at the end of Vermilion County Road 2100 N.

Mr. Diericx said employees for Berg Essex, a contractor, were at the facility on April 24 during a routine weekly inspection. He showed me a chronology of activities that he had prepared with respect to the complaint. His notes indicate that Berg Essex employees found large logs at the opening of the spillway that could not be removed safely by them. Since they had previously

¹ <http://il.water.usgs.gov/proj/nvalues/db/sites/03336645.shtml>

noted activity by beavers on previous trips, it became apparent that beavers had built a dam since the last weekly inspection completed on April 17.

Mr. Diericx's next entry said:

Tuesday, April 25(10:13-11:42 am) — Daniel Ribbe (contractor) clears the reservoir (outfall 002) spillway. The blockage contained tree branches, brush, etc. that had accumulated since the weekly inspection on April 17, blocking the flow of water through the spillway. Daniel estimated the amount of discharge after the blockage was removed as 8" (or 12,205 GPM or 27.19 cfs).

A more typical discharge would result in a 0.5" height in the spillway that was measured on April 11 that is equivalent to a flow rate of 191 GPM.

I donned steel toed shoes, zipper-front Tyvek coveralls, and an orange vest. We applied insect repellent to protect against ticks and mosquitos. We drove to the location of the reservoir spillway where I took pictures of the water in the reservoir and the spillway (photographs 1-3). The discharge over the spillway was clear and shallow.

We drove to the location labeled Start in Figure 4. From there we began walking southwest, hoping to find the confluence of the Dynegy flow with the unnamed tributary to the Middle Fork. We descended into steep valleys with streams at the bottom at least twice. Photographs 4-7 show sections of the first stream we crossed.

After about 75 minutes we reached a location close to where I placed a white star on the map in Figure 4. (I had a GPS with me, but the readings were not consistent because of the tree canopy and the batteries were running low.) The channel from the reservoir ranged 6-12 feet wide. The flow was rapid with several sections of whitewater where it flowed over rocks. We were not able to cross the stream and it did not appear that we could reach the confluence without descending and climbing at least one more hill. We decided to follow the channel northwest to the spillway. All along the way, the water was turbid and a light brown color (photographs 8-12). When I located the spillway, I took photographs 13-14.

My legs were getting weak and I felt dehydrated, so I told Mr. Diericx that we should return to the vehicle. We began walking almost parallel to the fence that runs along the south side of the reservoir and returned to the starting point. About halfway back, we found a v-notch weir (Photograph 15) that could have been used to monitor flow at some point.

We did not find the source of the white material, but it is reasonable to conclude that it was not the result of activity at the Dynegy site. It is possible that the increased flow on April 25 encountered something downstream before combining with the unnamed tributary.

On May 24, Mr. Rehn sent another email asking how my meeting with Dynegy went. I sent a summary of our hike and some of the photographs. I explained that the white material could have originated downstream from the areas we viewed.

Attachments: Figures
Photographs

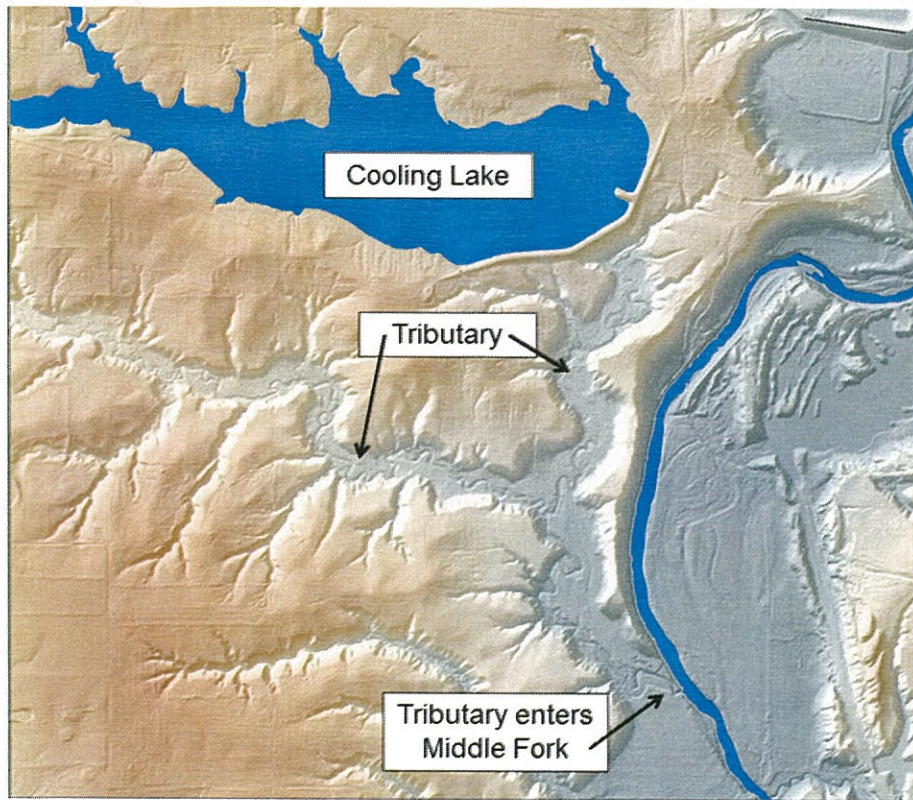


Figure 2 Lidar map provided by A. Rehn, Prairie Rivers Network.



Figure 3 Closer view of Lidar map with hillshade removed.

<https://univofillinois.maps.arcgis.com/apps/webappviewer/index.html?id=44eb65c92c944f3e8b231eb1e2814f4d>



Figure 1 Area map showing the unnamed tributary, the Middle Fork Vermilion River, and the Illinois Power Company Lake.



Figure 4 The base map is a Google Maps aerial view from 1998. All marker placements are approximate. The path of the spillway stream is visible, but faint.

Vermilion Site reservoir discharge timeline

Tuesday, April 11 – Berg Essex (contractor) completes their weekly rounds and there was a discharge of ½" (or 191 GPM) at the spillway. Sample results are provided in a table below.

Monday, April 17 – Berg Essex completes their weekly rounds, no discharge at the spillway.

Monday, April 24- Berg Essex notifies Dynegy about blockage at the spillway. During their weekly rounds they found logs too large to move safely at the opening of the spillway. It became apparent beaver's had built a damn since the last weekly inspection completed on April 17th. They had noticed beaver activity in the area on previous trips.

Tuesday, April 25 (10:13-11:42 am) – Daniel Ribbe (contractor) clears the reservoir (outfall 002) spillway. The blockage contained tree branches, brush, etc. that had accumulated since the weekly inspection on April 17, blocking the flow of water through the spillway. Daniel estimated the amount of discharge after the blockage was removed as 8" (or 12,205 GPM or 27.19 cfs)

Tuesday, April 25 (12:30 pm) – River flow at Oakwood gauging station increased 40-50 cfs (or 17,950 - 22,440 GPM).

Tuesday, April 25 (2:30pm) - Two men in a State of Illinois licensed vehicle (the plates had a "U" prefix) pulled up to the guard shack asking questions about a discharge into the river that they saw while canoeing earlier that afternoon. They stated that it was south of the main plant area.

Tuesday, April 25 (3:00pm)-Frank Bielser checked the spillway and estimated a discharge of 3"-4" (or 2,803 -4,315 GPM or 6.25 -9.61 cfs). The water was crystal clear.

Tuesday, April 25 (afternoon) –A call is made by canoeist to IEPA in regards to a soil laden discharge into Middle Fork Vermilion River believed to be from the Vermilion site.

Tuesday, April 25- (3:52 pm) - IEPA (Holly) contacts Dynegy about possible discharge from site.

Tuesday, April 25 (5:05 pm) - Andrew Rehn (Water Resource Engineer, Prairie Rivers Network) sends the following email to Bill Buscher (IEPA)

On Tue, Apr 25, 2017 at 5:05 PM, Andrew Rehn <arehn@prairierivers.org> wrote:
Hey Bill,

Here's some more information. The canoer identified the tributary as this one:

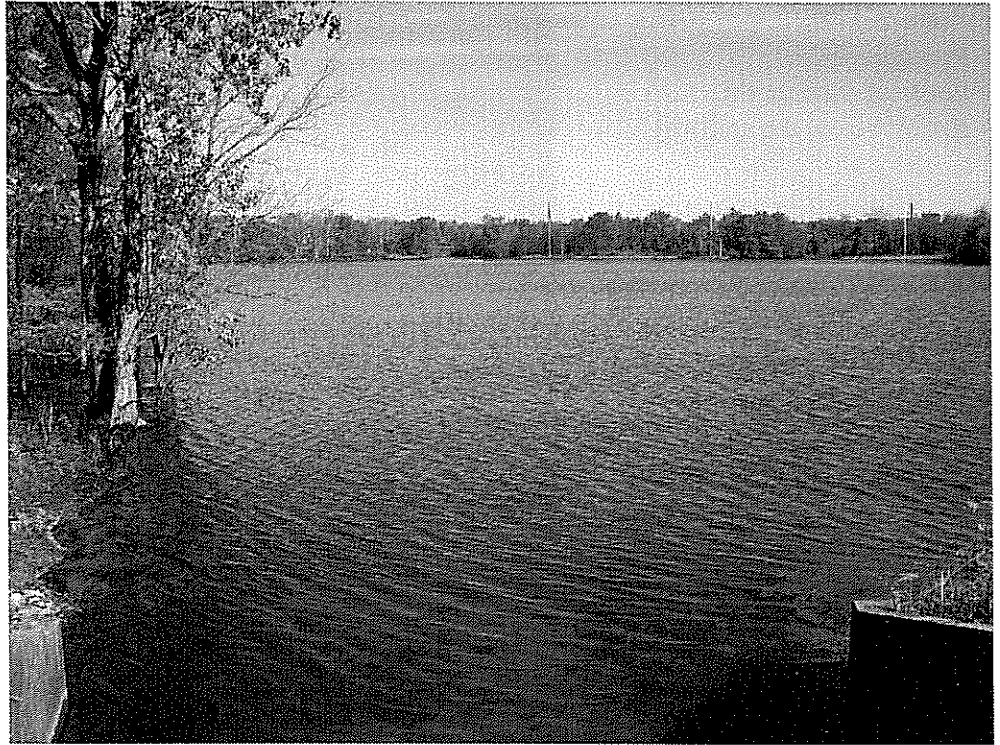


They described the flow as exceptionally high (1/8 - 1/4 of the Middle Fork), and milky white. The entire Middle Fork was turbid downstream. They said they regularly canoe the Middle Fork, so they're quite familiar with the site and said it was exceptionally high flow from the tributary.

Andrew

Wednesday, April 26 (8:00 am) – Rick Diericx and Tom Davis arrived and investigated the discharge. They walked through the woods between the reservoir and river, but were not able to access where the reservoir discharge entered the river. The water being discharged at the spillway was clear and no sediment was noticed in the discharge...see pictures below. The discharge is estimated at 2" (or 1,526 GPM or 3.40 CFS)

Photograph 1
Looking northwest from
the bridge over the
reservoir



Photograph 2
Looking southeast and
down at the spillway that
is Outfall 002



Photograph 3
Looking south at the
stream below the spillway



Photograph 4
Looking north at flow in
the first stream we
encountered (~35 minutes
into our walk) while
attempting to find the
intersection of the
Dynergy stream with the
large unnamed tributary
to the Middle Fork



Photograph 5
Looking west across the
stream shown in
photograph 4



Photograph 6
Looking downstream in
the waterway shown in
photographs 4 and 5



Photograph 7
Looking north at the same
stream shown in
photographs 4-6, Rick
Diericx is shown looking
upstream



Photograph 8
This is the spillway
stream



Photograph 9
Another view of the
spillway stream with
whitewater over the rocks



Photograph 10
This is a side stream of
the spillway stream that
flowed mores slowly
through a low area and
rejoind the main channel



Photograph 11
A location in the spillway
stream with several
logjams



Photograph 12
This photograph was
taken at bend in the
spillway stream



Photograph 13
Looking north at the
bridge and the spillway
downstream of the
location in photograph 2



Photograph 14
Looking west at the wall
of the spillway



Photograph 15
Looking south at a V-
notch weir

