HISTORIC STRUCTURE REPORT

DAM NO. 6 AND ITS ASSOCIATED STRUCTURES

CHESAPEAKE AND OHIO CANAL HISTORICAL PARK

MD./D.C./W.VA.

BY

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PREFACE

This report has been prepared to satisfy in part the research needs for the stabilization and preservation of Dam No. 6 and its associated structures. The purpose of this project has been an effort to provide a thorough historic study of the Dam No. 6 complex to insure that accurate and historically correct procedures will be followed in preserving these structures from further deterioration.

A number of persons have assisted in the preparation of this report. Thanks are due to Interpretive Specialists Ellwood Wineholt and Superintendent William Failor for assistance at the park headquarters, to Maria Joy and Robert Kvasnicka of the National Archives who were helpful in suggesting and locating unpublished documents; and to Supervisory Historian John F. Luzader, Historical Architect Thomas N. Crellin, and Editors Greg Sorenson and Linda Wedel Greene for reading the manuscript and providing editorial assistance.

Harlan D. Unrau
December 16, 1974

PREFACE TO THE 2014 DIGITAL EDITION

This edition was created by volunteers who transcribed the text, proofread, and formatted it for free distribution as a pdf file.

As a volunteer in the library of the C&O Canal headquarters who has been walking and studying the C&O Canal since, 1977, I have occasionally added additional or clarifying information in the form of footnotes. These will always include "—kg" at the end to identify them as such additions. I have made corrections in a similar manner when information from new sources corrects earlier information.

The photographic section is entirely new, adding many images and improving the quality of those in the original document. Not all illustrations and photographs in the original could be recovered.

Finally, the entirely obsolete "Recommendations" section has been left out of this edition.

Karen M. Gray, Ph.D.
C&O Canal NHP Headquarters Library
October 2014

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SUMMARY OF DOCUMENTARY INFORMATION

Located just above the junction of the Potomac and Cacapon Rivers some ten miles above Hancock, Maryland, Dam No. 6 stretched 475 feet in length across the Potomac and had a fall of nearly 16 feet. The dam was built of heavy timber cribbage securely fastened to the natural rock of the river bed. The cribbage was tightly pinned together and braced, and the voids were filled with stone rubble. The upstream face, much like Dams No. 4 and 5, was protected by vertical, heavy planking. The top surface sloped slightly upward in the direction of the river's flow and had a heavy plank deck. On its downstream side, the slope of the dam was much less than that of Dams Nos. 4 and 5. From the apex of the dam, the downward inclination was only 5 feet in a distance of 25 feet, at the end of which it assumed a perpendicular shape. Company engineers chose this form for the dam because they felt that it was the best method of protecting the structure from the reaction of the water and from injury by debris carried over it during the high stages of the river.

The line of Dam No. 6 did not follow a straight line across the river. Instead, at a distance of 150 feet from either abutment, the center part of the dam projected 5 feet upstream from the straight line drawn from end to end of the structure. However, the lines from the abutments to the projecting points and the line of the central section of the dam were straight.

Dam No. 6 was different from Dams No. 4 and 5 in several respects. At the base of the dam, midway under its front slope, an additional range of timbers was constructed to prevent erosion by the water flowing over the dam. The front slope also rested upon additional timbers and was covered with six-inch plank.

The Virginia abutment was constructed of limestone from a quarry on Cacapon Mountain within one mile of the dam. The Maryland abutment, guard lock and flume were built with sandstone from quarries at Sideling Hill, located less than two miles upstream from the structure. Loose stone for filling was quarried from various locations on Tonoloway Hill, Sideling Hill, and Long Hollow, a stream that crossed the canal just above the dam. Cement used in constructing the Dam No. 6 complex came principally from Shaffer's Mill at Roundtop Hill and Hook's Mill at Hancock. The dam impounded a sizeable pool of slack water for a distance of some five miles to about midway between the mouths of Sideling Hill Creek and Fifteen Mile Creek.

From Guard Lock No. 6, the feeder from the river ran alongside the canal between Locks Nos. 54 and 55 before entering the waterway at the foot of the former one-tenth of a mile below the dam. Lock No. 55 and the guard lock were both connected to the Maryland abutment by masonry walls. A culvert, constructed in the typical form of such structures, was built alongside the guard lock to serve as a flume for feeding the canal.

The contract for the construction of Dam No. 6 was let to Hollman and Reynolds in September 1836, and the contract for the dam abutments and the guard lock was let to George Weaver on the same date. Operations on these structures started that fall. Aside from some trouble in procur-

ing an adequate supply of cement, the construction of the dam abutments and the guard lock proceeded without serious difficulty. Thus, these structures were completed in the late summer of 1838.

In September 1838, the canal board declared the contract for Dam No. 6 abandoned because the contractors had disobeyed the orders of canal engineers in regard to the manner of doing the work and because there was an insufficient work force employed on the structure. The construction of the dam was completed in February 1839 by canal company employees under the supervision of Engineers J. R. Young and John A. Byers. In April, the 27.3-mile section of the canal between Dam Nos. 5 and 6 was watered.

That Dam No. 6 was a durable structure is revealed by the records, which show that the first major recorded damage to it occurred during the flood of 1852. The high water of the freshet caused a serious breach around the Virginia abutment. To repair the damage, a heavy masonry wall was substituted for the embankment that was carried away.

After the Civil War, a number of repairs were made to the dam. In 1865, new ice guards were placed on top of the dam to ease ice in the slackwater above over the dam. Five years later, ice guards were put on the dam abutments. In 1873, the vertical sheeting of the downstream face of the dam was thoroughly repaired.

The floods of 1877, 1886, 1889, and 1936 caused extensive injury to Dam No. 6. In the 1877 freshet, both abutments were damaged, but they were repaired by the spring of 1878. Because the dam developed a severe leakage problem, it was partially rebuilt in 1884. Three devastating floods in 1886 opened a hole in the structure 237 feet wide. This portion of the dam, together with other parts of the structure that had been weakened by the flood, was reconstructed under the supervision of Samuel D. Young of Cumberland. The 1889 flood again washed out 100 feet of dam, but it was back in service by 1891. Nearly half of the dam was destroyed by the 1936 freshet that left only the weakened portion of the Maryland side standing.

STATEMENT OF HISTORICAL SIGIFICANCE

One of the basic problems confronting the engineers of the Chesapeake and Ohio Canal Company was that of providing for the watering of the canal. The source of water was obviously the Potomac River. In order to impound a portion of the river's water and provide its diversion into the canal at regular intervals, dams were constructed across the river at seven locations.

Above each dam was built what was known as a guard lock. The guard locks generally served three purposes: to admit water into the canal, to provide entrance and exit for boats to and from the canal into the slackwater above the dam, and to give protection to the canal and its structures in periods of high water. This was the reason for the high head walls built on the upper end of the locks.[1]

Located just above the juncture of the Potomac and Cacapon Rivers, Dam No. 6 was constructed to supply water for the 27.3-mile stretch of the canal down to Dam No. 5. The dam looms large in the history of the canal, for it was here that construction of the waterway came to a standstill in 1842 while the company searched for funds to complete the project. Eight years were to pass, with Dam No. 6 as the head of navigation, before the last "Fifty Miles" were completed and the western terminus at Cumberland reached.

[1] The upstream or guard gate of the guard/inlet lock was a structural part of the guard wall that protected the lock and inlet channel (when there was one) from high water. —kg

ADMINISTRATIVE DATA SECTION

A. NAME OF STRUCTURE

Dam No. 6, Chesapeake and Ohio Canal National Historical Park, Washington County, Maryland.

The Dam No. 6 feeder and Guard Lock No. 6 are associated structures in the Dam No. 6 complex.

B. PROPOSED USE OF STRUCTURE AND JUSTIFICATION FOR SUCH USE

The list of Classified Structures for the Chesapeake and Ohio Canal National Historical Park has not been completed. Therefore, the order of Significance of Dam No. 6 and its associated structures has not been established, nor has the level of treatment been determined. The draft Master Plan for the canal proposes that the 29.5-mile stretch of the canal between Paw Paw Bends and Lock No. 62, on which Dam No. 6 is located, be managed as a "Long-Term Remote Area" designed to "Provide the user with the opportunity for a long-term primitive hiking, biking or horseback experience." As the management objectives for this area "are seen as providing for those who seek a near wilderness involvement with the environment, the present program proposes only such stabilization as is necessary to protect Dam No. 6 and its associated structures from further deterioration.

C. COOPERATIVE AGREEMENT, IF ANY, EXECUTED OR PROPOSED FOR OPERATING STRUCTURE

There are no cooperative agreements or other documents bearing on the management or use of the structure.

D. DESCRIPTION OF PROPOSED CONSTRUCTION ACTIVITY

To stabilize and preserve Dam No. 6 and its associated structures from further deterioration, the following projects should be undertaken: (a) steps should be taken to prevent loose rock and other materials from the dam from being washed downstream, (b) trees and other plant growth now growing on the dam, its abutments and its protection walls should be removed, (c) the masonry abutments and protection walls of the dam as well as the masonry of Guard Lock No. 6 should be regrouted.

CHAPTER 1: THE CONSTRUCTION OF DAM NO. 6, 1836–1839

In the spring of 1835 Chief Engineer Charles B. Fisk of the Chesapeake and Ohio Canal Company was asked by the Board of Directors to prepare a detailed study of the line of the canal from Dam No. 5 to the mouth of the Cacapon River that was to be let out for bids. He was to review a survey made by Engineer Alfred A. Cruger the previous spring and the general specifications for canal structures to see what, if any, economies could be effected.[2]

Regarding the location of Dam No. 6, Fisk informed Commissioner George Bender on June 16 that there were two prospective sites. One was just below the mouth of the Cacapon River—a location that would enable the canal to take advantage of the Cacapon trade. The other site was at Martin's Mill, some six miles above the Cacapon, where the dam could be built at less cost. At Martin's Mill, "a good and comparatively cheap foundation could be built as the hard sandstone rock foundations ran at right angles to the river". Below the Cacapon the sandstone formations ran at oblique angles to the river, and the foundation would have to be placed "down from 3 to 5 feet in low water". In addition the topographic features of both sites dictated, in Fisk's opinion, that a sixteen-foot-high dam was required at Martin's Mill and a twenty-six-foot structure at the Cacapon. The choice of the two locations would be determined by whether the Board was willing to pay the difference in cost in order to accommodate the Cacapon trade.[3]

At the meeting held on June 17, the Board directed Clerk John P. Ingle to advertise for proposals for the "construction of such Sections, Locks, Aqueducts, Culverts and Dams as may be reported by Chief Engineer Fisk, to be ready for contract between Dam No. 5 and the Cacapon". The time limit for completion of the masonry works on this portion of the canal was to be October 1, 1836, and for other works, November 1.[4]

Three days later, a notice appeared in the *National Intelligencer* announcing that proposals would be received at the canal company's Washington office:

> till Monday the 29th inst., at 10 o'clock A.M. for the construction of twenty of the most difficult sections of the Canal, upon the line located between Dam No. 5 and the Great Cacapon, on the Potomac River; for an Aqueduct across Licking Creek, and one across the Great Tonoloway; for nine lift locks and one Guard Lock, and for all the Culverts necessary upon the above line; and also for a Dam across the river Potomac at the mouth of the Cacapon, or at some suitable point above that place.[5]

When the board convened on July 1 to consider the proposals that had been submitted for these works, the directors deferred further action on Dam No. 6 by approving the following resolution:

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[2] *Seventh Annual Report* (1835), C&O Canal Co., p. 7.
[3] Fisk to Bender, June 16, 1835 Ltrs. Recd., Commissioner. All manuscript source materials referred to in this report are deposited in the Department of the Interior files at the National Archives and are designated Record Group No. 79.
[4] *Proceedings of the President and Board of Directors*, D, p. 341.
[5] *National Intelligencer*, June 20, 1835.

> that the determination, in relation to the Dam at Martin's Mill, be suspended until the Engineer has reported upon the Dam [No. 7] at the vicinity of the South Branch, with the intention of making this latter Dam a feeder of the Canal down to Lock No. 45, and of so constructing the Canal between Lock No. 45 and the South Branch, that an intermediate Dam may be constructed hereafter, if it should be found necessary.[6]

On July 20, 1836, Commissioner Bender wrote to Gassaway Cross, a large land owner living near the mouth of the Cacapon, that the directors were about to decide "whether they will have a dam above the mouth of the Cacapon or feed [the canal] by an aqueduct placed below it". If he could acquire land for the Virginia abutment from Cross at reasonable terms, the directors would favor building a dam [at that location]. Accordingly, Bender wanted to acquire "about eight acres in nearly a square form of your bottom land opposite the point of Tonoloway Hill & extending perhaps in a narrow strip down the River so far as necessary to secure our work". Cross was to tell him immediately how much he wanted for the land and "how much more in a gross sum in addition for all damages" he might "possibly sustain by overflow caused by said Dam". In estimating this latter sum, Bender told him that "when the water is running six inches over the Dam" it would leave his "bank at least four feet out of water."[7]

When Cross demanded an exorbitant sum of money, Bender informed the board on July 27 that his hopes of purchasing the land were dashed. As soon as he could obtain an accurate description of the required land from company engineers, he would initiate condemnation proceedings against Cross in the Washington County Court at Hagerstown.[8]

On August 9, Cross offered to sell the eight-acre plot of ground wanted by the company. If the company would agree to build an embankment up the river from the dam to protect his land from a freshet, he would accept a reasonable sum of money for all future damages that his land might sustain.[9]

On the eighteenth, Bender informed the Board that he and Fisk had "agreed with Mr. Cross for six acres of his land (nine acres including river slope)". The company would pay Cross $300 for the land and $200 for the removal of his buildings within nine months. Cross was to have "full right to all water which will pass through a trunk to be inserted by the Company through our embankment". The bottom of this trunk was "to be three inches above the Comb of the Dam and to be three inches by forty eight inches in area". Cross had demanded, and Bender had promised that the canal company would "not establish a ferry on the land so conveyed or dispose of any right for others to do so". The damages relinquished in the agreement were not to "include any that may be sustained by high water backing up the ravine above his land if it shall pass from thence & sweep down through his land lying parallel with that conveyed."[10]

The board approved this agreement between Bender and Cross on August 25 and immediately ordered "that a dam be erected across the Potomac, above the mouth of the Cacapon". After further discussion, Clerk Ingle was directed to "advertise for proposals for constructing the Dam,

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[6] *Proceedings of the President and Board of Directors*, D, pp. 355–356.
[7] Bender to Cross, July 20, 1836, Ltrs. Sent, Commissioner.
[8] Bender to Board of Directors, July 27, 1836 Letter Book, Commissioner's Office.
[9] Bender to Byers, August 5, 1836 Letter Book, Commissioner's Office.
[10] Bender to Board of Directors, August 18, 1836 Letter Book, Commissioner's Office.

and also, for the abutments thereof, and for a Guard Lock at the same place, until Tuesday, the 13th day of September next".[11]

At their meeting on September 14, the directors accepted the proposal of Joseph Hollman and George Reynolds for the construction of Dam No. 6. Although a thorough search of the canal company records at the National Archives failed to turn up the contract or specifications for the dam, several details of the agreement were found in the proceedings. The contractors were to be paid twenty-three cents per cubic foot for range timber and two dollars per hundred feet, board measure, for sheeting, heel piling and ice guards.

The board also accepted the bid of George Weaver for the construction of Guard Lock No. 6 and the abutments of the dam. While the contract and specification for these works could not be located, several details of the agreement were found in the proceedings. Weaver was to receive the following prices:

Masonry in Guard Lock and Flume	$5 per perch
Excavation of earth	25¢ per cubic yard
Embankment	18¢ per cubic yard
Puddling	15¢ per cubic yard

The foundations of the abutments and the guard locks were to be laid that fall.[12]

Resident Engineer John A. Byers informed Fisk on November 1 that:

> We have at last commenced laying in the abutment of the dam. The foundation is all that could be wished, with the exception of the two small points. The rock does not vary more than 3/10 [of a foot] from a level, and the height of the Abutment will be 35 8/10 [feet]. That is 1 2/10 [feet] less than was estimated, and I believe the Dam will not be over 18 feet in height, and giving it 500 feet of length will carry the Virginia abutment entirely into the banks.

Hollman and Reynolds were expected to begin their operations on the dam within a week. If their timber was cut, it would be easy for them "to place two wings across the river this fall, as 1/3 of the bed of the river" was dry. One half of the foundation for the dam could be completed before winter with little effort.[13]

On November 9 Commissioner Bender informed Ingle that the foundation of one of the abutments had been completed. Accordingly, the first monthly estimate was made out, and Weaver was paid $212 on November seventeenth.[14]

At the ninth annual meeting of the canal company stockholders on June 12, 1837, the board offered the following observations on the progress of construction between Dams Nos. 5 and 6:

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[11] *Proceedings of the President and Board of Directors*, E, p. 130–131.
[12] *Ibid*., E, p. 141–142. Also see, Ingle to Weaver, September 14, 1836 Ltrs. Sent, C&O Co.
[13] Byrne to Fisk, November 1, 1836 (Ltrs. Recd., Chief Engineer).
[14] Bender to Ingle, November 9, 1836 (Letter Book, Commissioner). Also see, Ledger A, C&O Canal Co. A list of the payments made by the company for the construction of Dam No. 6 and its associated structures may be seen in Appendix A.

> The masonry on this line has been executed in a workmanlike manner, and of excellent materials, chiefly of limestone. At one time fears were entertained that suitable stone could not be obtained, but we have been agreeably disappointed, good quarries having been found at several points, although, in some instances, the stone is hauled a considerable distance. Between Dam No. 5 and Cacapon, besides numerous culverts of from four to twelve feet span, and one over Little Tonoloway of forty feet span, there are ten locks of eight feet lift each, including the guard-lock at Dam No. 6, and two aqueducts crossing Licking Creek and Great Tonoloway. The first is an arch of ninety feet span, the second of sixty-five feet between the abutments—the arches of both being turned. The materials on all are of the most approved kinds, and the workmanship cannot be surpassed.
>
> On all these constructions strength and durability have been the consideration of the Board, and all unnecessary ornament, which would embrace their cost, has been dispensed with.
>
> The progress made on Dam No. 6, located a short distance above Cacapon river, has thus far realized the expectations of the Board; and, from the well-known character of the contractors for enterprise and punctuality, we entertain no apprehension as to the completion of this work in time to admit the water simultaneously on the whole line. The abutments of the dam on both shores have been raised to the height of ten or twelve feet, and would, in all probability, have been nearly completed by this time, but for the repeated interruptions from high freshets. All the materials for the dam are in readiness, and it can be erected as soon as the river shall fall to its usual low-water mark. A guard-lock at the dam serves the purposes of a feeder to the canal, and for the admission of boats navigating the pool, as well as for the reception of the trade from the Cacapon, which, by a dam across that stream at its mouth, and a canal of less than one mile in length, may be connected with the main stem by means of the pool and guard-lock. By former surveys, it was proposed to locate the dam a short distance below the mouth of the Cacapon; but on a more thorough examination by our engineer, he reported decidedly against the location at that point mainly on the ground that the bed of the river did not present a suitable foundation for such a structure, and that the hazard of its being swept away would be greatly augmented by its increased height at that point. Other and substantial reasons were adduced, which decided the Board in the adoption of the present location.[15]

On June 18 Byers recommended to Fisk that Hollman and Reynolds should gravel behind the abutments of Dam No. 6. In his opinion, ten feet of gravel would be sufficient to buttress the abutments and guard wall. The remainder of the angle formed by these walls was to be filled with the material excavated for the guard lock. The materials filling in the angle would then be covered "with a proper thickness of gravel" or slate.[16]

On August 9, the Board approved Fisk's recommendation to hire Edward Gobin to superintend the work on Dam No. 6. Having worked on the dams for the Pennsylvania Canal, he was, in the opinion of the Chief Engineer, well qualified for the task. Gobin was to be paid four dollars per day for his services.[17]

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[15] *Ninth Annual Report* (1837), C &O Co., pp. 5–6.
[16] Byers to Fisk, June 18, 1837, Ltrs. Recd., Chief Engineer.
[17] Fisk to Bender, August 9, 1837 Ltrs. Recd., C&O Co., and Ingle to Gobin, August 10, 1837 Ltrs. Sent, C&O Canal Co.

Contractor Weaver notified the Board on September 6 that his supply of cement was insufficient to enable him to complete the abutments of Dam No. 6 that fall. Accordingly, he desired permission "to use common lime as a grout for the top of the wall".[18]

On December 29 Hollman and Reynolds submitted to Fisk a bill for extra work done on Dam No. 6. The bill, totaling $1,543.50, included expenses for labor, powder and blacksmithing not included in their contract.[19]

On January 26, 1838, Byers submitted to the chief engineer's office an estimate for a guard bank of 3,850 feet on the Virginia shore above Dam No. 6. The materials for the embankment were to be procured between the guard bank and the river. Although most of the materials were within 120 feet of the proposed guard bank, some of the earth would have to be transported as much as a one quarter of a mile. His estimated costs of the work were as follows:

Grubbing	$50
220 cu. yds. of excavation of earth mucking	352
10,100 cu. yds. of embankment, transported less than 120 feet @ 21¢	2,121
4,500 cu. yds. of embankment, transported less than ¼ mile @ 25¢	1,125
	[20]$3,648

In mid-February, an ice freshet struck the Potomac Valley above Hancock, causing problems for the construction operations between Dams Nos. 5 and 6. Although there was no ice lying "upon or against the frame of the dam [No. 6] at present", Byers feared that a small rise in the river would move the ice toward the dam and possibly injure it. Accordingly, he had ordered the workers to raise the bank across the mouth of the guard lock and culvert four feet higher.[21]

On March 15, Byers informed Fisk that the ice had moved off the dam. So far as he could see, only two logs on the top front course had been carried off.[22]

On April 8 Byers notified the chief engineer that "if we insist upon having what is strictly 'heart yellow pine plank' for the foundation of Guard Lock No. 6, we must pay for the material delivered $25.00". As an alternative to this additional expense, he suggested that if the planking were covered with "American Cement," "good yellow pine plank" would suffice for the foundation and "be fully equal to the pine timber foundation".[23]

At the annual meeting of the canal company stockholders on June 4, the Board announced that:

> For some time previous to the above communication [dated December 23, 1837] the available means of the company had become exhausted in the prosecution of the heavy line of canal on the

[18] *Proceedings of the President and Board of Directors*, E, p. 310.
[19] Hollman and Reynolds to Fisk, December 29, 1837 Ltrs. Recd., Chief Engineer.
[20] Byers to Fisk, January 26, 1838 Ltrs. Recd., Chief Engineer.
[21] *Ibid*., February 16, 1838 Ltrs. Recd., Chief Engineer. In an enclosed statement, Byers reported that $34,264.61 worth of work had been accomplished on Dam No. 6 up to January 1, 1838.
[22] *Ibid*., March 15, 1838 Ltrs. Recd., Chief Engineer.
[23] *Ibid*., April 8, 1838 Ltrs. Recd., Chief Engineer. "American Cement" was a new type of cement that had been patented by Thomas C. Coyle of Baltimore. It had been already used in the construction of Aqueducts Nos. 3 and 6.

> twenty-eight miles between Dams Nos. 5 & 6, and in the payment of debts of the company including interest to the State [Maryland]. We had been compelled, also, to resort to temporary loans from banks, obtained with difficulty, and to issue the notes of the company, for the redemption of which it was necessary to provide funds.
>
> The act authorizing the subscription of $3,000,000 to the stock of the company had passed as far back as June, 1836: delays had occurred in the appointment of the commission, to negotiate the State bonds issued to meet her subscription, as well as in their departure although the company had entered into a provisional contract for the purchase of the State bonds to the amount of her subscription yet they could in no wise be made available for present relief."[24]

On June 14, Fisk notified the Board that early in the operations on Dam No. 6 they had authorized by special order an advance of $5,500 to Hollman and Reynolds "on account of materials prepared but not delivered that could not strictly, under the contract, be estimated". Since that time, the materials had gradually been delivered and estimated in with the work. This month the estimate included all the materials from which the total advance was deducted. After deducting 20 percent from this total for retained money on the contract, the present estimate amounted to only about $900, considerably less than the contractor had hoped for. Accordingly, Fisk urged the Board to pay the contractors all but 12-½ percent of the retained money on their contract.[25]

On July 4 the board approved a final estimate for George Weaver for the construction of "the Guard Bank on the Virginia shore at the abutment of Dam No. 6". All told, the company had paid $3,698.69 for the completion of the project.[26]

Two days later Clerk Ingle notified Acting Commissioner Thomas Fillebroun that the Board had authorized the payment of estimates "in favor of Hollman & Reynolds, with a deduction of twelve and a half per cent only". However, the directors retained the right to raise the deduction to 20 percent at any time.[27]

As the work on Dam No. 6 was lagging by mid-summer, Fisk traveled up to the Cacapon River on July 12. Unable to see the contractors before he left for Cumberland, he sent them a letter telling them that the "force at present employed is entirely inadequate to the completion of the dam this season."[28]

When Fisk informed the board six days later that work on Dam No. 6 was behind schedule, the board instructed the chief engineer to order the contractors to employ a force of sufficient number to enable them to finish their work by September. If the contractors failed to do so, their contract would be declared abandoned and the work would be conducted by the superintendent, under the direction of the chief engineer.[29]

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[24] *Proceedings of the Stockholders*, B, pp. 150–151.
[25] Fisk to Board of Directors, June 14, 1838 Ltrs. Sent, Chief Engineer.
[26] *Proceedings of the President and Board of Directors*, E, p. 456. Also see, Fisk to Fillebroun, June 30, 1838 Ltrs. Sent, Chief Engineers.
[27] Ingle to Fillebroun, July 6, 1838 Ltrs. Sent, C&O Canal Co.
[28] Fisk to Hollman and Reynolds, July 12, 1838 (Ltrs. Sent, Chief Engineer).
[29] Fisk to Board of Directors, July 18, 1838 (Ltrs. Sent, Chief Engineer). Also see, *Proceedings of the President and Board of Directors*, E, p. 466.

On July 30 Chief Engineer Fisk notified Hollman and Reynolds that they were "required forthwith to employ a force of not less than twenty five carpenters who are good mechanics". In addition, they were to hire "at least twenty five men accustomed to using the axe" and "as many common laborers & others as will keep the above force constantly supplied with timber, and as will enable you to progress as rapidly with the stone filling as the timber work will admit of."[30]

President George C. Washington reported to the board on August 9 that he had made arrangements for hastening the completion of Dam No. 6. He had engaged A. B. Proctor to let his hands from Section No. 259 go to the dam to work for Hollman and Reynolds.[31]

During an inspection of Dam No. 6 in late August, Byers found "that the last course of ties had been put on wrong". In constructing the ties, no attention had "been paid to the boxing of the range timber and ties together". Although he had informed Hollman and Reynolds and their hands that this work would have to be taken up and redone, they had disregarded his orders. After several raucous arguments, the workers had bolted down the timbers and covered misconstructed work with loose ties.[32]

The following day, Byers sent a letter to the board explaining further the cause of the difficulties at Dam No. 6. During the previous summer, Hollman and Reynolds had made an agreement "by which Mr. Reynolds was to have exclusive control of putting the dam together". Now Hollman was trying to get full control of the work by turning the workers against Reynolds. Thus, when Reynolds attempted to have the workers construct the dam according to company specifications; Hollman often instructed them to ignore him. Therefore, Byers recommended that the board of directors take the project out of the contractors' hands and complete it themselves.[33]

On September 4 Fisk replied to Byers by directing him to discharge Mr. Campbell, the foreman of the contingent of laborers loyal to Hollman. If the workers refused to continue operations under Mr. Beideman, the foreman that Reynolds had appointed earlier, they would be dismissed from the line.[34]

The next day, Byers notified the chief engineer that "operations upon the dam are going forward with perfect order and propriety". Hollman had left the work in the hands of Reynolds, and the laborers had gone back to work for Reynolds "with apparent cheerfulness". Many alterations were being made to correct Hollman's work, but "no labor short of throwing away all that Hollman put up would enable us to have it precisely right". If Hollman would leave Reynolds alone for three weeks, Byers was certain that the framework of the dam would be finished. He had directed that a platform be made on the Maryland shore "as near to the stone lying above the dam as a boat could be brought". This would aid the stone filling by enabling the workers to cart the stone and dump it onto the boats from the platform. At the present time there were thirty carpenters and axemen and thirty common laborers at work on the dam.[35]

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[30] Fisk to Hollman and Reynolds, July 30, 1838 (Ltrs. Sent, Chief Engineer).
[31] *Proceedings of the President and Board of Directors*, D, pp. 475–476.
[32] Byers to Fisk, September 2, 1838 Ltrs. Recd., Chief Engineer.
[33] *Ibid*., September 3, 1838 Ltrs. Recd., Chief Engineer.
[34] Fisk to Byers, September 4, 1838 Ltrs. Sent, Chief Engineer.
[35] Byers to Fisk, Sept. 5, 1838 Ltrs. Recd., Chief Engineer.

At their meeting on September 7, the board, unaware that the problems at Dam No. 6 had been resolved, declared the contract with Hollman and Reynolds to be abandoned. During the meeting the September 5 letter from Byers was delivered and read. When the directors were assured that Reynolds was solely in charge of the work, they gave Fisk authority to suspend the operation of the abandonment.[36]

On September 8 Byers notified Fisk that Reynolds had increased the forces working on Dam No. 6 "to upwards of 80 hands". Within a week, when the estimates were paid, he would be in a position to hire more workers.[37]

By September 19 the situation at Dam No. 6 had deteriorated again. Reynolds was sick at his farm four miles from the dam, and only half of the carpenters were at work. The teams were not supplying the needed timber, and the stone filling was lagging. Therefore Byers requested Fisk to come to the Cacapon and determine whether the work should proceed under the contract of Hollman and Reynolds.[38]

When Fisk arrived at Dam No. 6, he found that many of the old difficulties had returned. In addition Reynolds informed him that the rising cost of construction made it "certain that the work cannot be completed at the prices without a sacrifice of property greater than he can bear". Fearful the construction would come to a total standstill, the chief engineer, under authority granted him by the board, declared the contract with Hollman and Reynolds abandoned. Arrangements were made by Fisk for the canal company to purchase materials from the contractors at the following rates:

Round ties delivered in the pool of the dam	11¢
Flattened ties delivered in the pool of the dam	20¢
Range timbers	22¢
Sheeting	2½¢
Stone quarried	50¢
Two large boats @ $250	$500
Two small boats @ $120	$240
Capstans & c.	$60
7 broadaxes	$25
3 cross cut saws	$15
24 axes	$48
8 adzes	$20
14 timber bars	$28
28 Wheelbarrows	$72
	[39]$1,008

[36] *Proceedings of the President and Board of Directors*, E, p. 485. Also see, Fisk to Byers and Fisk to Board of Directors, Sept. 7, 1838 Ltrs. Sent, Chief Engineer.
[37] Byers to Fisk, Sept. 8, 1838, Ltrs. Recd., Chief Engineer.
[38] *Ibid*., Sept. 19, 1838 Ltrs. Recd., Chief Engineer.
[39] Fisk to Board of Directors and Fisk to Hollman and Reynolds, Sept. 22, 1838 Ltrs. Sent, Chief Engineer.

On September 26 the board approved the final payment of $8,310.06 to George Weaver for the construction of the Guard Lock No. 6 and the abutments of Dam No. 6. All told, in securing this work the company had paid out $46,548.58 in twenty-two installments to the contractor.[40]

On September 27 Fisk sent Byers a list of instructions regarding the superintendence of the work on Dam No. 6. Under the overall supervision of Byers, Engineer Proctor would attend to the stone filling, and Engineers Cameron and Biedeman would direct the wood work. James R. Young was to make all the payments, for which he was to draw upon the commissioner's office for funds. To keep the work progressing, the board had already authorized Commissioner Sprigg to advance the sum of $5,000 to Young.[41]

On September 30 Byers reported to Fisk that operations had commenced on Dam No. 6 earlier in the week "with about 30 hands". Within four days, this number had risen to fifty. During this four-day period, the laborers had "put down 820 feet lineal of range timber and 850 feet of ties", and redone much of the work done by Hollman and Reynolds. As the water in the river was too low to move the boats upstream to get stone, Byers was compelled to wheel stone up from the river below the dam and to cart surface stone from the west slope of Tonoloway Hill.

Despite the progress on the dam, Byers still complained that he needed more workers to finish the structure by winter. Recruitment of reliable hands was difficult since the wages he offered were low and the work would be finished in several months. Accordingly, he urged the chief engineer to raise wages and send a recruiter among the recently arrived Dutch immigrants in Baltimore.

After a heavy rainstorm the previous week, Byers had ordered the carpenters to put as much sheet piling as possible on the dam. They had put on 300 feet of planking for which he had paid $1.75 per hundred feet board measure.[42]

As no provision had been made for the construction of the lock gates for Guard Lock No. 6, Fisk notified the Board on October 5 that he had hired William Easby to build them. These gates differed from earlier lock gates in three aspects: the mitre posts were increased in size by 25 percent; they were lined on their lower side with 2 inch oak plank; and they required 3 screw bolts each 5 feet long and one inch in diameter and 32 smaller bolts.[43] The estimated cost of building these lock gates was $1,200.[44]

Five days later Byers reported to the chief engineer that during the past week an average force of seventy-nine men had worked on Dam No. 6, putting in 500 perches of stone, 1,100 linear feet of

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[40] *Proceedings of the President and Board of Directors*, E, p. 495. See also, Ledger Book A, C&O Co.

[41] Fisk to Byers, September 27, 1838 Ltrs. Sent, Chief Engineer. Also see, *Proceedings of the President and Board of Directors*, E, p. 494, and Ingle to Sprigg, Sept. 26, 1838 Ltrs. Sent, C&O Co.

[42] Byers to Fisk, Sept. 30, 1838 Ltrs. Recd., Chief Engineer.

[43] Presumably the size increase would apply only to the upstream gate of the guard lock, which had to be as high as the guard wall (AKA guard bank) of which it was an integral part. In this case the "guard wall" constitutes primarily the abutment, the guard lock, and the downstream end of Lock 55, all connected by the stone wall that functioned as a guard wall. The only additional protection was a short wall on the river side of the guard lock and a guard bank between the river and the inlet channel of about 600 ft. length, based on subsequent reports.. —kg

[44] Fisk to Board of Directors, Oct. 5, 1838 Ltrs. Sent, Chief Engineer.

range timber and 1,700 lineal feet of ties. If the weather remained good, he planned to use all eight boats at his disposal to transport stone from Sideling Hill, 2-½ miles upstream, to the dam for filling. At this rate, it would take two days to "fill it level with the timbers". As for the timber level, it had reached "to within 2 courses of the top".

In the report, Byers indicated that the cost of the operations on the dam since the contract with Hollman and Reynolds had been declared abandoned amounted to $1,400. The stone filling, carted to the river a distance of 1,000 feet from out of the "long hollow", cost the company 65 cents per perch. From the river, the stone was taken alongside the dam or wheeled up into the cribs and packed at an additional expense of 51.8 cents per perch. It cost the company 5-½ cents per linear foot to get the timber out of the river and place it on the dam, and framing costs 9 cents per linear foot which was nearly thirty percent above the former contract price.

Considerable attention was also being given to the repair of faulty work performed by Hollman and Reynolds. These operations included dressing the slope and getting ends of logs and chips out of the dam. Much of this work was already done, and the workers had just completed putting on two courses of sheet piling and 100 feet of 6-inch sheeting on the two-inch slope of the lower side to protect it from water action.[45]

On October 11 Byers hired Mr. Smedley to frame the gates for Guard Lock No. 6. For this work, which included putting on all the irons and hanging the gates, Smedley agreed to a payment of $300.[46]

The following day Byers informed the chief engineer that the hands at Dam No. 6 had "put down above 400 feet of ties and nearly as much range timber and about 140 perches of stone" that day. With eight more days of good weather, only the planking would be incomplete.[47]

On October 15 William Easby submitted several bills to the chief engineer for the construction and installation of sliding gates for the flume at Guard Lock No. 6. The bills included the following items:

6 gate slides, 3230 pounds @ 4-½¢	$145.35
Patterns for sliding gates	26.05
Planning 6 sets of slides, 873 inches @4¢	34.92
Fitting gates	28.25
6 screws, with pinions, boxes & c. @ $24	144.00
72 bolts for slides @ 25¢	18.00
24 screw bolts for screw posts @30¢	7.20
	$403.77

In addition, Easby charged the company $200 to utilize and transport 2,000 feet of pine for framing the sliding gates. Concerning the iron work for these gates, Easby enumerated the following items:

[45] Byers to Fisk, Oct. 10, 1838 Ltrs. Recd., Chief Engineer.
[46] *Ibid*., Oct. 11, 1838 Ltrs. Recd., Chief Engineer.
[47] *Ibid*., Oct. 12, 1838 Ltrs. Recd., Chief Engineer.

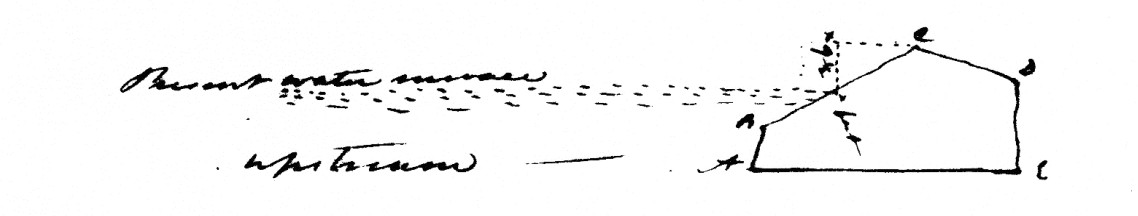
8 gates with iron frames, 3,556 pounds @ 4½¢	$160.47
4 pivots and 4 boxes for gates, 156 pounds @ 5¢	7.80
Fitting up gates	17.80
32 screw bolts	8.00
	[48]$197.07

On October 15 Fisk recommended to the Board of Directors that they authorize funds for the completion of the Dam No. 6 complex. Whereas it was estimated that more than $10,000 would be needed to finish the dam, the Board had only set aside $5,000.[49]

Heavy rains on October 15–16 swelled the water above the dam to about 18 inches above the back range of the timbers. This made it a tedious operation of "getting down the last log", but, according to Byers on October 16, about 300 feet of the last range of timber had been secured with iron bolts. This timber capped over the last range of ties, thereby preventing them from rising in periods of high water. During the preceding week, the workers had put 1,000 feet of range timber and 1,160 feet of ties and filled 550 perches of stone in the dam.[50]

At their meeting on October 17 the directors agreed to Fisk's earlier recommendation to make a further sum of $5,000 available for the work on Dam No. 6. In addition, they ordered the laborers at the dam also to finish the dry walling on Guard Lock No. 6.[51]

Chief Engineer Fisk reported to the board on November 1 on his recent examination of the canal between Georgetown and Dam No. 6. About 140 men were working on the dam, and the work was progressing well. The work on the structure was described by the following sketch:



The body of the dam and the stone filling were complete. Except for 100 feet, the sheeting on the face of the dam (DE) was finished. The sheeting along the slope of the dam (CD) was on for 60 feet while materials for an additional 100 feet were on the ground. The sheet piling along AB was done. The major work that still needed to be done was the slope (BC). Of the 119 ties required for the bearing timbers or ribs for this sheeting, only 70 had been put in. On these ties, ten ranges of bearing timbers or ribs were to be placed lengthwise across the dam, making in all 4,700 lineal feet of wood. Materials for the sheeting and the ice guards were nearly all delivered and lying on the ground.[52]

[48] Easby to Fisk, Oct. 15, 1838 Ltrs. Recd., Chief Engineer.
[49] Fisk to Board of Directors, Oct. 15, 1838 Ltrs. Recd., C&O Co.
[50] Byers to Fisk, Oct. 16, 1838 Ltrs. Recd., Chief Engineer.
[51] *Proceedings of the President and Board of Directors*, E, p. 509. Also see, Fisk to Byers, Oct. 17, 1838 Ltrs. Sent, Chief Engineer.
[52] Fisk to Board of Directors, Nov. 1, 1838 Ltrs. Sent, Chief Engineer.

On November 5 Fisk ordered Easby to send up cast-iron gates for the flume at Guard Lock No. 6 and the abutment of the dam.[53] For the former, two small gates were needed, and for the latter, three large ones.[54]

On the seventh Byers notified Fisk that all the timber needed for Dam No. 6 had arrived except for twenty-six feet of sheeting. Workers were bringing this needed lumber to the river about one mile above the dam and floating it down to the dam.[55]

During the last stages of construction on Dam No. 6, Engineer Young submitted to Fisk on November 26 an analysis of the cost of different items of work on the structure since the contract with Hollman and Reynolds had been declared abandoned. Between September 24 and November 1 a total of 11,324 lineal feet of timber had been laid at an average cost of nearly 15 cents per lineal foot. Canal hands had laid 2,798 perches of stone at an average cost of 65.7 cents per perch. At the quarry near the site of the dam, 1,305-½ perches of stone had been quarried and delivered at an average cost of 51.6 cents per perch.[56]

Chief Engineer Fisk reported to Clerk Ingle on December 4 that he had just returned from a visit to Dam No. 6. The entire structure, except for graveling, was done. On the upstream slope a space 200 feet long by 16 feet wide had been left open to prevent a rise of the water level until everything was finished. Within two days, this gap would be closed with three-inch planking. Because of problems with ice during the winter months, the graveling would be deferred until spring.[57]

After the upstream slope of the dam was closed, water was let into the canal. Almost immediately leaks were discovered. As the last course of planking was put down in the water, the joints at the lower end of the planking were open as much as one half inch. Accordingly Fisk ordered the hands to gravel the dam to close these joints and enable the canal to fill with water. To accomplish this task, the canal hands were to use the black slate on Section No. 258 which had also been used behind the Maryland abutment.[58]

Although the company had made $5,000 available to Young to pay accounts for the completion of Dam No. 6, Fisk notified the directors on December 31 that $10,000 more was needed to close the accounts. Of this sum, $5,000 was needed immediately for work already done on the dam, and $5,000 would be needed in the future to pay for work yet to be done on adjoining structures.[59]

On the same date, Fisk instructed Byers to order Contractor Weaver to remove rock that he had thrown into the canal prism during the construction of the guard lock and dam abutments. The

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[53] Presumably these are paddle gates of which two were usually in the bottom of each miter gate for a total of eight. What is described here is anomalous in number and size (which one would expect to be of the same size if paddle gates). —kg
[54] Fisk to Easby, Nov. 5, 1838 Ltrs. Sent, Chief Engineer.
[55] Byers to Fisk, Nov. 7, 1838 Ltrs. Recd., Chief Engineer.
[56] Young to Fisk, Nov. 26, 1838 Ltrs. Recd., Chief Engineer.
[57] Fisk to Ingle, Dec. 4, 1838 Ltrs. Recd., C&O Co.
[58] Byers to Fisk, December 22, 1838 Ltrs. Recd., Chief Engineer.
[59] Fisk to Board of Directors, December 31, 1838 Ltrs. Recd., C&O Co.

still unfinished drywall "on the river side at the tail of the guard lock" was to extend "100 feet as at other locks".[60]

In January 1839 the board authorized Commissioner Sprigg to make two advances of $5,000 each to Young to close the accounts for Dam No. 6. Because the commissioner was rapidly running out of funds, the board ordered Clerk Ingle to forward $3,000 directly to Young including $2,000 in canal company notes and $1,000 in notes from the Bank of Washington.[61]

Work on the Hancock level was finally completed on April 1, and within two weeks water had been admitted into the recently completed levels of the canal between Dams Nos. 5 and 6. With water in these levels, 137 miles of the canal from Georgetown to the Cacapon were open to navigation.[62]

On the twenty-seventh an article appeared in *Niles' National Register* announcing that it had been a "great pleasure" to learn that water had been "admitted into the twenty-seven miles of this canal lately finished, and that boats are now navigating that, as well as the older portions of the line". This signaled the completion of 137 miles of the canal "leaving but fifty miles to finish, in order to connect the town of Cumberland with tidewater, by the most perfect canal navigation which this country can boast of".

A great increase in canal trade could be expected, because the recently opened twenty-seven miles connected with the National Road at Hancock, at which point the descending trade could now be transshipped on boats. Already, several vessels laden with potatoes, fish, salt, and other merchandise from the District cities had passed up the canal as far as Dam No. 6.

Because of the unseasonably low stage of the Potomac, river navigation between Cumberland and Dam No. 6 was extremely hazardous, so much so that of seven coal boats that had recently left Cumberland only three had reached the canal at the Cacapon, the others having stove in their bottoms on rocks. Such an occurrence, the writer observed, should underscore to the people of Maryland just how important it was for them that the last fifty miles of the canal be completed and opened to navigation.[63]

On May 15 Byers reported to the chief engineer that the canal between Hancock and Dam No. 6 was in good order. For the past month, there had been 5.5 feet of water in the feeder level below the dam. If he could obtain $1,000 from Commissioner Sprigg, he would be able to close all the accounts for Dam No. 6 except for a final settlement with Hollman and Reynolds.[64]

Because construction of the Baltimore and Ohio Railroad was progressing up the Potomac Valley faster than the canal, the board was becoming increasingly alarmed in May 1839 that its rival might impinge on the canal company's plans to build a feeder to supply additional water from

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[60] Fisk to Byers, December 31, 1838 Ltrs. Recd., C&O Canal Co.
[61] *Proceedings of the President and Board of Directors*, F, p. 102. Also see, Ingle to Sprigg, January 2 and 17, 1839, and Ingle to Young, January 19, 1839 Ltrs. Sent, C&O Canal Co.
[62] Byers to Fisk, April 15, 1839 Ltrs. Recd., Chief Engineer.
[63] *Niles' National Register*, April 27, 1839.
[64] Byers to Fisk, May 15, 1839 Ltrs. Recd., Chief Engineer.

the Cacapon to the canal. Accordingly, the directors requested that the railroad send them information as to the proposed location of their line at the Cacapon and South Branch. On May 23, the following memorandum regarding the proposed location of the railroad at the Cacapon was sent by Benjamin H. Latrobe, Jr., to Fisk:

> Height of railroad above low water in Great Cacapon: 28 6/10 feet.
> Height of railroad above Dam No. 6, half a mile above Great Cacapon: 9 9/10 feet.
>
> The underside of the bridge timbers may (by suspending the floor frames) be placed above the water surface of the supposed canal (feeder) level, a height in the clear of 9 2/10 feet.
>
> The proposed height of the under surface of the railroad viaduct across the Great Cacapon above the level of Dam No. 6 (or the level of water surface in the proposed feeder canal) is, as projected at present 7 feet.
>
> The grade of the Railroad is level across the Great Cacapon, and begins to rise at 4/100 feet per 100 feet or 21 12/100 feet per mile westwardly at the west bank of that river. The best point for the feeder to cross the line of the Railroad would be by a separate bridge about 300 feet west of the west bank of the G[reat] Cacapon, and the grade of the Railroad having risen 1 2/10 feet in that distance, this quantity must be added to the above number of 9 2/10 feet, making 10 4/10 feet, the height in the clear above the feeder canal surface at which a permanent wooden bridge could be made to pass the railroad over the feeder.[65]

The board reported on June 3 that water had been in the newly opened sections for almost two months. Since then there had been no interruptions to navigation, although some apprehension had been felt that the sinks in the limestone country around Prather's Neck might prove troublesome. With the exception of three lockhouses, completing the deposit of gravel at Dam No. 6 and "finishing off some comparatively light work," the canal between Dams Nos. 5 and 6 was finished.[66]

On the sixth Byers informed the chief engineer that a recent rise in the river "gave 4.2 [feet] of water over the comb of the Dam [No. 6]". A large number of trees had been washed over the dam, but they had all passed over the structure without causing any damage".[67]

The stockholders learned from a report submitted by the Board on August 5 that:

> A short distance below dam No. 6 is Lock No. 54, which connects with the canal above the dam. The feeder from the river enters the canal at the foot of this lock, running close alongside of the canal between Locks No. 54 and 55; the latter lock, of 8 feet lift, being connected with the abutment of the dam. The guard-lock to the feeder is also connected with the same abutment. Alongside of this lock is a culvert, built like an ordinary canal culvert, which serves as a flume for feeding the canal. The guard-lock and the abutment of the dam are raised above the highest elevation to which, at this place, the river has ever been known to reach.

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[65] Latrobe to Fisk, May 23, 1839 Ltrs. Recd., Chief Engineer. Because of the poor condition of the canal company finances, this projected feeder from the Cacapon to the canal was never built.
[66] *Eleventh Annual Report* (1839), C&O Co., p. 9.
[67] Byers to Fisk, June 6, 1839 Ltrs. Recd., Chief Engineer.

> Dam No. 6 is 475 feet in length, and has a fall of nearly 16 feet. It is a crib-dam, and on the upper side has the same slope and form as dam nos. 4 and 5. There is, however, a very material difference in the construction of the lower side. From the highest point or apex of the dam, the slope or inclination is much less than in the dams lower down the river. The fall is only 5 feet in a distance of 25 feet, at the end of which it assumes the perpendicular shape. This form of the dam was preferred, as the best calculated to protect it from the reaction of the water, and from receiving injury from heavy bodies thrown over it at the high stages of the river; and experience has shown its decided advantages in these respects. The line of this dam is not exactly straight. At the distance of 150 feet from either abutment are points that are 5 feet out of (and in a direction up stream) the straight line drawn from end to end of the dam. The lines from the abutments to this point, and from point to point are however straight.
>
> In some other particulars this dam differs from those which have been mentioned. There is an additional range of timbers midway, under the front slope of the dam, from the foundation up. There are also additional timbers upon which the slope rests, and this slope is covered with 6-inch plank.
>
> The Virginia abutment is constructed of limestone from a quarry on that side of the river, within a distance of a mile; and the Maryland abutment, guard-lock and flume, are built with sandstone from quarries in Maryland, at about the same distance. In the plan of the works connected with this dam, provision has been made for a connection with any improvement which may hereafter be made up the valley of the Cacapon. The water is backed by the instrumentality of this dam a distance of 5 miles, to about midway between the mouths of Sideling Hill and Fifteen Mile Creeks.[68]

After nearly seven months of discussion, the board and Hollman and Reynolds agreed to a final settlement of the accounts for the construction of Dam No. 6. All told, the contractors were paid $36,167.37 for their work on the dam until their contract was declared abandoned in September 1838. After that date, the canal company paid $23,066.97 to canal hands and individual contractors under the superintendence of J. R. Young and John A. Byers to complete the structure.[69]

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[68] *Report of the General Committee of the Stockholders of the Chesapeake and Ohio Canal Company* (Washington, 1839), p. 11.

[69] *Proceedings of the President and Board of Directors*, E, pp. 80, 85, and F, pp. 55, 59, 136–137, 146. Also see, Ledger Book A, C&O Co.

CHAPTER 2: THE OPERATION AND MAINTENANCE OF DAM NO. 6: 1840–1974

A heavy ice freshet in early February 1840 put Dam No. 6 to its sternest test to date. Ice that had been piled 4 feet above the towpath at Fifteen Mile Creek had moved downstream toward the Cacapon, and by the time it reached Sideling Hill Creek it had attained a height of 16-½ feet above the comb of the dam. At Dam No. 6 the ice had accumulated until it was piled 8 feet high at the top of the Maryland abutment. Fortunately, the water soon "fell to about 6 feet below the top of the abutments", thus relieving further pressure on the dam.

During the ice freshet, Dam No. 6 suffered considerable damage. The short river wall below the Maryland abutment was carried away, and with it "about ½ of the guard bank for 150 feet in length". This damage amounted to 300 perches of masonry and about 4,000 cubic yards of embankment. The protective embankment was washed out "to a line parallel with the guard lock and 10 ft. in the rear of the [lockkeepers] shantee". The "circular ends of both abutments where the force of the current struck them" were considerably worn and small chunks of masonry were broken out. Although the woodwork of the dam was not damaged, the ice flow had "quarried out a large amount of stone."[70]

Damage resulting from the ice freshet was not immediately repaired, despite the extensive leaks in the dam. In fact, Joseph Hollman, Superintendent of the Fourth Division, did not order repairs to be made until late August. At that time, he began work to secure the foundation of the dam.[71]

On September 3, Hollman reported to Chief Engineer Fisk that his men were engaged in repairing the protection wall and cribwork at Dam No. 6. Because the middle section of the guard walls was three feet lower than at its two ends, he recommended that the middle part be raised. He also felt that it was necessary to extend the crib work of the dam "some distance below the wall in order to make a good connection in the bank below". To repair the woodwork of the dam, Hollman estimated that it would take "about 5,000 feet range timber and about 6,000 feet [of] ties at a rough calculation to carry it up as high as the abutment."[72]

John G. Stone, the new Superintendent of the Fourth Division, informed Fisk on September 15, 1841, that the level of the Potomac was too low to flow over Dams Nos. 5 and 6. The water at the latter structure had fallen to the point where it was just even with the bottom of the flume opening at Lock No. 54. Accordingly, three or four boats were transporting gravel to the dams in an effort to tighten them and raise the level of the water in their pools.[73]

On the nineteenth Stone notified the chief engineer that the water in the pool of Dam No. 6 had raised four inches due to a short rainstorm. Because of the poor state of the canal company fi-

[70] Byers to Fisk, Feb. 14, 1840 Ltrs. Recd., Chief Engineer.
[71] Hollman to Fisk, Aug. 24, 1840 Ltrs. Recd., Chief Engineer.
[72] *Ibid*., Sept. 3, 1840 Ltrs. Recd., Chief Engineer.
[73] Stone to Fisk, Sept. 15, 1841 Ltrs. Recd., Chief Engineer.

nances, Stone had been unable to use more than one boat to carry gravel to the dam. Because the water had raised to within three feet of the comb of Dam No. 5, he intended to send up a scow to help at Dam No. 6.[74]

During the summer of 1843, the board of directors took steps to improve the position of the canal as a transportation agency pending the successful completion of the waterway to Cumberland. It opened negotiation with the Baltimore and Ohio (B&O) Railroad for a temporary arrangement to give the canal access to the Cumberland iron and coal trade. The railroad, which had reached Cumberland in 1842, agreed to transport coal from that city to the canal at Dam No. 6, at 2 cents a ton per mile, as long as the amount of coal so carried did not interfere with its own business or require a material increase in facilities. The final arrangements were made on September 21, and the railroad soon began construction of a turnout, several switches and a depot at Dam No. 6 [on the Virginia side] to facilitate the transfer of the coal and iron from the railroad cars to the boats.[75]

Engineer James Murray of the B & O Railroad informed Fisk on October 14 that the site selected by the canal company on which the railroad was to build the necessary tracks would involve "about 650 feet of trestle work" at $1.50 per foot for the main track alone. This expense in addition to "the necessary tracks, switches and other fixtures upon the present road bed" would exceed the amount of money at Murray's disposal. Therefore he recommended that the canal company pay for the trestle work. The ironwork and other materials necessary for the tracks were in a "forward state of preparation" and would be ready to be put down within a week if the canal company would agree to pay for the trestle work.[76]

One week later Fisk replied to Murray, urging him to use the money at his disposal to construct "the track and trestle work complete so far as it will go, omitting as much of the track as will be equal in cost to the trestle work under the part constructed". An expansion of the track could then be made as soon as it was needed, but he assumed that the track and trestle work that could be built with the available funds would allow "for a commencement of business".[77]

The stockholders were informed on June 3, 1844, that the coal trade from Dam No. 6, under the arrangement whereby the B&O Railroad hauled coal to the canal from Cumberland, had been placed in operation on April 20. However, representatives of Baltimore interests in the Maryland legislature had prevented the passage of an appropriation to aid the canal in completing the waterway to Cumberland.[78]

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[74] *Ibid*., Sept. 19, 1841 Ltrs. Recd., Chief Engineer. Within five days water was running over both dams.

[75] McLane to Coale, Sept. 7, 1843 in *Proceedings of the Stockholders*, C, pp. 243–245. Also see, Coale to McLane, Nov. 9, 1843 Ltrs. Sent, C&O Canal Co. According to Walter S. Sanderlin, *The Great National Project* (Baltimore, 1946), pp. 151–152, the agreement proved to be more harmful to the canal's interest than it was beneficial. While the amount of coal shipped under the arrangement was inconsequential, the railroad company made political capital of it. The B&O interests in the Assembly urged that the arrangements be made permanent, that the railroad act as a feeder for the canal. The argument was persuasive and apparently won "considerable support in the legislature and the state at large".

[76] Murray to Fisk, Oct.14, 1843 Ltrs. Recd., Chief Engineer.

[77] Fisk to Murray, Oct. 21, 1843 Ltrs. Sent, Chief Engineer.

[78] *Sixteenth Annual Report* (1844), C&O Co., in *Proceedings of the Stockholders*, C, pp. 305–307.

On the fifteenth the firm of Atkinson and Templeman of Cumberland sent "an estimate of cost for 50 feet of wharf at or near Dam No. 6", which the board accepted. Their proposed plan included the following items:

> A Breastwork of Logs squared 12 feet high from its bed with ties placed to the bank, excavate back from the edge 23 feet, lay over the whole a two inch oak plank floor and make sheets of oak plank along the edge of the wharf to break the fall of the Coal into the Boats, all for $3 per 1 foot.

The quantities of materials that would be needed for the wharf were as follows:

194	cubic yards excavation	@ 20¢	$38.80
30	squared logs of oak	@$2	60.00
3,500	feet oak plank	@$1.25	43.75
840	feet oak plank for sheets	@$1.25	10.50
			$153.05

The contractors also proposed to build the remainder of the wharf to accommodate the coal trade, which they estimated would require an additional 100 feet.[79]

The B&O Railroad and its ally, the city of Baltimore, began a large-scale assault in May 1845 on the trade of its arch competitor who threatened to deprive the railroad of all possible chance of success even before it was completed. The railroad struck its blows specifically at the two main sources of present and prospective canal revenue—the flour trade and the coal trade. It abruptly terminated its arrangement for the transportation of coal from Cumberland to Dam No. 6 at two cents a ton per mile, raising its rates to four cents a ton per mile for coal and six cents for iron. At the same time, the railroad made arrangements for a more extensive trade with the city of Baltimore, which was more important to the railroad. The canal company refused to recognize the abrogation as an act in good faith, but made no sustained protest.[80]

Engineer William H. Bryan reported to Fisk on January 20, 1846, that "ice from above has all lodged in the pool of Dam No. 6". From the dam up to Section No. 265, the ice was unbroken, but above that point up to Section No. 269 it was "nearly all on edge and packed very thick". Because he expected that the ice would cause a freshet, he recommended that a small gap that had developed in the towpath on Sections Nos. 266 and 267 be filled immediately.[81]

A series of floods swept through the Potomac Valley in 1846, interrupting trade on the canal for a total of sixty-nine days. On December 1 John G. Stone, now superintendent of the Third Division, informed Fisk that it would "be necessary to protect the bank at Dam No. 6 by continuing the crib lower down and finishing the stone protection that was commenced some time ago". If this work was not completed before another freshet, the injury to the dam and the sections below it would be very serious.[82]

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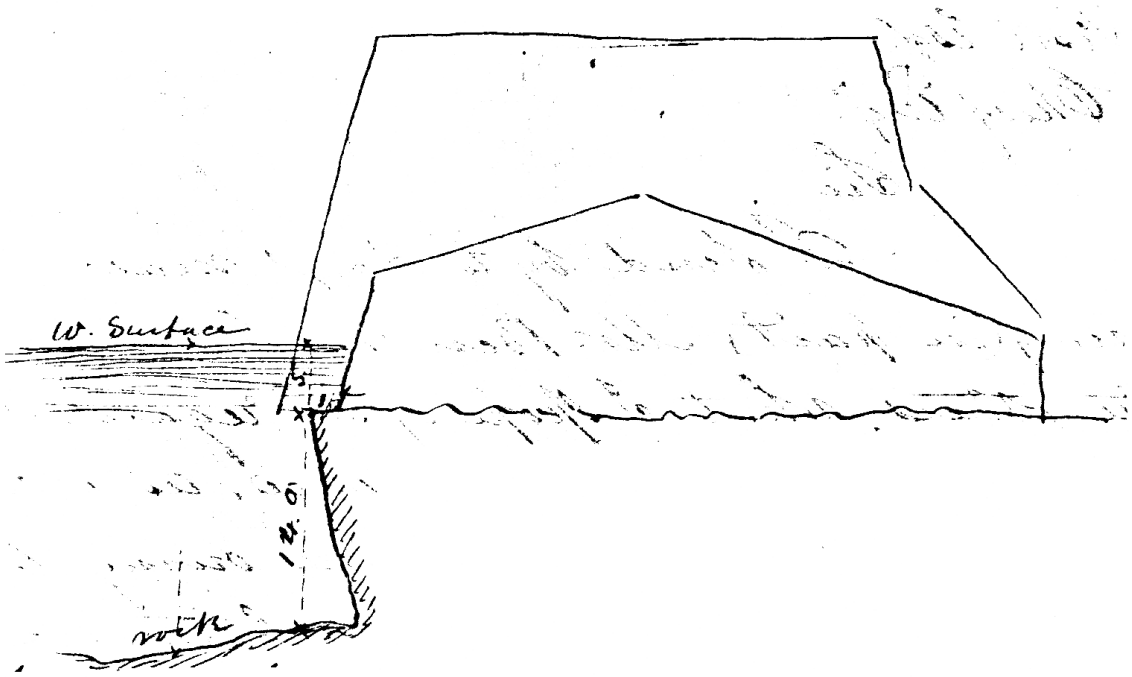
[79] Atkinson and Templeman to Fisk, June 15, 1844 Ltrs. Recd., Chief Engineer.
[80] McLane to Coale, May 7, 1845 Ltrs. Recd., C&O Co. Also see, *Proceedings of the President and Board of Directors*, G, pp. 252–253.
[81] Bryan to Fisk, Jan. 20, 1846 Ltrs. Recd., Chief Engineer.
[82] Stone to Fisk, Dec. 1, 1846 Ltrs. Recd., Chief Engineer.

While pushing the completion of the canal between Dam No. 6 and Cumberland, the board also turned its attention to that portion of the waterway below the Cacapon. This, the old part of the line, was now badly in need of repair. Once again, in April 1849, the State of Virginia came to the rescue of the canal, this time authorizing the guarantee of $200,000 worth of repair bonds to be issued by the canal company. The money was to be applied to the renovation of the canal from Dam No. 6 to the Potomac Aqueduct. The work of renovation was then pushed so as to have the entire line in readiness for the formal inauguration of the canal.[83]

As part of the restoration effort, Assistant Engineer John A. Byers took some measurements of Dam No. 6 in mid-July 1849. During his inspection of the structure, he found that:

> Along the whole length of the crib on the Maryland side for about 5 feet in breadth the water was about 8 feet deep, and the rock under the crib does not appear to have been disturbed. Along in front of the dam from 4 to 7 feet in width is to all appearance as it was when the Dam was first built (that is about 13.0 B the feeder level), and assuming 13.0 B for the foundation, at 10 feet from the Dam the rock has been cut away 7 ft. in depth, at 20 ft. from the Dam, it has been cut away 13 ft. in depth, and at about 70 or 80 ft. below the dam 25 ft. in depth of rock has been thrown out pretty uniformly across the river. Below this I took no soundings.
>
> For about 10 feet in length of the Dam next the Va. abutment, the cutting out of the rock approaches within 1 ft. or even less of the front range, & runs down with a tolerable uniform slope, inclining under the Dam thus:



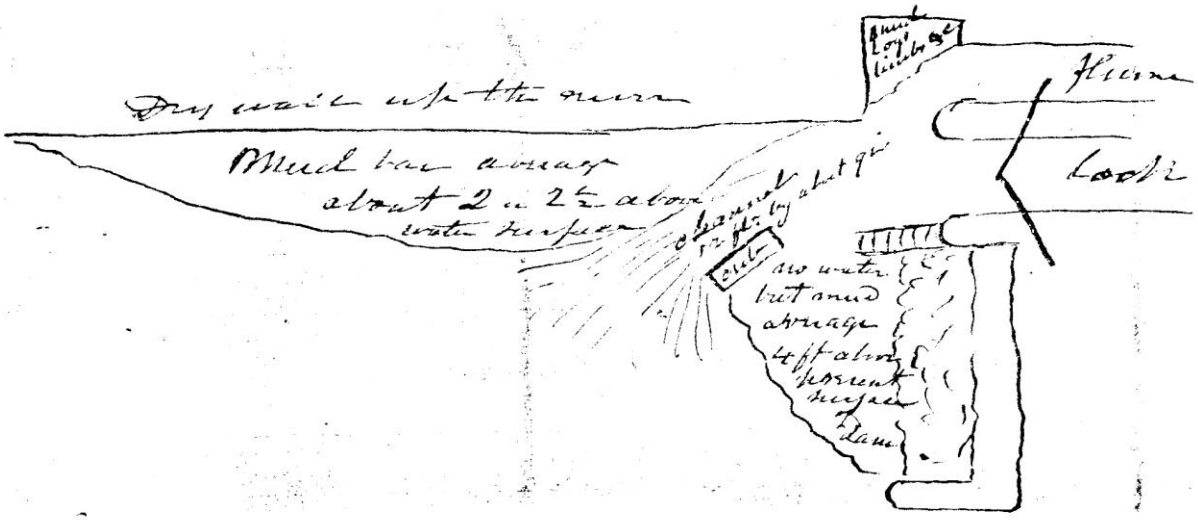
> Just at the corner of the abutment, the rock is cut down plumb so that no part of the masonry is undermined, and at about 10 ft. from the corner at the foot of the riprap, there is no injury done. The short distance next the Va. abutment is the only place I found with soundings at about 20 ft. apart, where the rock has a slope under the dam. It is generally cut down with a steep slope, or rather suc-

[83] *Proceedings of the President and Board of Directors*, H, pp. 127, 251–257.

> cession of steps leading from the dam, and this slope has a base of from 5 to 15 ft. and in some cases the least base where the excavation is deepest, the stone filling is not anywhere disturbed as I could discover.

Because he had been unable to survey all of the rock under the dam, Byers indicated his intention "of making a raft of old railroad sleepers which would cost no more the $8". This raft, which was to be 160 feet long and 4 feet wide, would enable him to obtain an accurate description of the rock below the dam.[84]

On July 25 Byers informed the chief engineer that the water at Dam No. 6 had "fallen about 3 ½ ft. below the comb of the dam". Only "a section of water about 12 ft. wide and 8 or 9 inches deep" was feeding the canal through Guard Lock No. 6 in the following manner:



Where the channel now was located, the current had "cut the mud out and carried it into the lock and some into the canal". Accordingly he had ordered one of the engineers "to open a sufficient channel for a boat to get in."[85]

Superintendent Stone, on August 1, notified Fisk that the pool behind Dam No. 6 had risen about four inches. As the water below the dam was falling, it proved that the recent graveling had tightened the dam.[86] Five day later, Stone informed the chief engineer that although water was running over the dam, he would "continue to boat stuff on Dam No. 6 as long as we can".[87]

On November 5, 1849, Fisk instructed Superintendent Stone to put a force at work on Dam No. 6 as soon as possible. They were to commence "at or a short distance below the tail of the Guard lock and raise the bank to a level 3.00 feet above the highest water, as far down as to a point midway from the Guard lock to McEvery's". The bank was to "be protected its full height and as

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[84] Byers to Fisk, July 18, 1849 Ltrs. Recd., Chief Engineer.
[85] *Ibid*., July 25, 1849 Ltrs. Recd., Chief Engineer. [Presumably it is the guard lock and inlet channel into which the mud has been carried making boat traffic to and from the river difficult. —kg]
[86] Stone to Fisk, Aug. 1, 1849 Ltrs. Recd., Chief Engineer.
[87] *Ibid*., Aug. 6, 1849 Ltrs. Recd., Chief Engineer.

far as there has heretofore been any cutting of the outer slope by the freshets with heavy rip rapping from the point of the Tonoloway Hill". The stone was to be "arranged so as most effectively to prevent its being disturbed by high water".

Fisk also ordered Stone to construct "a waste of 300 feet, 6¼ inches, at the first rocky point below the dam". The lower end of the waste was to be located "about midway of the rocky point," and the inside portion of the waste was to "have a two foot inner paving".

About halfway between the dam and the lower rocky point, the towpath was to be leveled off as far as the waste extended. The surface of the towpath would thus be "the better for being of coarse materials".

Below the lower bluff, another 300-foot waste was to be built. The upper end of this structure was to be several "feet below the upper end of the curve above the bluff".[88]

Superintendent L. Benton of the Third Division informed Fisk on March 31, 1851, that there was 5-½ feet of water on all levels of his division except for the feeder level below Dam No. 6 which had 5 feet 8 inches. Boats could pass over his division "drawing 4 ft. 3 or 4 inches with safety". All of the restoration work on Dam No. 6 begun in 1849 was now completed, and with two scows that had recently been built for him, he was confident that he could keep his division in good repair.[89]

The worst flood in the history of the Potomac, to that date, devastated the entire line in 1852. The flood was a surprise to the canal board and a disaster to the waterway itself. The directors had raised the embankments at the most exposed places above the level of the highest freshets in the history of the valley. They based their action on the levels attained in the flood of 1847, which had been the worst in sixty years. The precaution proved to be in vain, for in April 1852, the river rose six feet higher in some places than the levels attained in 1847. The points where the heaviest damage was inflicted on the waterway were at Great Falls, Seneca, and Dams Nos. 3, 4, and 6. By the time the restoration work was completed, the cost of repairs amounted to $100,000.[90]

At Dam No. 6, the 1852 flood caused a serious breach around the Virginia abutment. Fisk was undecided whether an earth bank or a masonry wall should be put in at the breach. Accordingly, he sent a letter to William Parker, general superintendent of the B&O Railroad, asking under what terms the railroad would transport stone from a quarry in Morgan County, Virginia, if the canal company determined to build a masonry wall.[91]

Heavy rains in mid-July again raised the Potomac to dangerous levels in the vicinity of Dam No. 6. On July 16 Fisk notified Clerk Ringgold that the water was within two feet of the top of the dam and still rising rapidly. By working the men day and night with some putting in eighteen-hour shifts, he felt that the embankments at the dam could be saved.[92]

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[88] Fisk to Stone, Nov. 5, 1849 Ltrs. Sent, Chief Engineer.
[89] Benton to Fisk, Mar. 31, 1851 Ltrs. Recd., Chief Engineer.
[90] *Twenty-Fourth Annual Report* (1852), C&O Co., pp. 3–4 and 13.
[91] Fisk to Lowe, May 5, 1852, and Fisk to Parker, June 25, 1852 Drafts of Ltrs. Sent, Chief Engineer.
[92] Fisk to Ringgold, July 15, and 16, 1852 Ltrs. Sent, C&O Canal Co..

The following month (on August 20) Fisk requested Superintendent William P. Sterritt of the Cumberland Division to send some hands to Dam No. 6 to aid in the repairs. He had determined to construct the masonry wall where the flood had caused the breach around the Virginia abutment of the dam, he preferred laborers "accustomed to quarrying and the handling of stone".[93]

On August 22 Superintendent O. G. Lowe of the Hancock Division sent Fisk a list of the cost of repairs to his division from May 1 to July 31. All told, the gravelling and lining of Dam No. 6 had cost $140 and repairs to the breach at the Virginia abutment had amounted to $2,899.50.[94]

In early September the masonry work at Dam No. 6 was nearly brought to a standstill because of the lack of stone. Although much stone at the Morgan County quarry was ready to be transported to the dam the B&O Railroad was slow in sending a locomotive and cars to the quarry to ship it. Because winter was approaching and Fisk was anxious to finish the masonry work, he sent an urgent request to L. M. Cole, the master of transportation of the B&O, that the necessary equipment be dispatched to Morgan County to transport the stone to the dam.[95]

On December 6 the canal company paid Henry Myers $187.50 for 1,500 perches of stone that had been quarried on his land in Morgan County for the masonry wall at Dam No. 6. Despite the company's insistence that this was the correct amount of stone quarried, Myers notified the board that the number of perch was closer to 2,000.[96]

The board informed the stockholders on June 6, 1853, that:

> The damages caused by the freshet of April, 1852, have been repaired in the most thorough manner, and the plans of Mr. Fisk for that purpose, have been carried out, so far as the means at our disposal would admit.
>
> It is the subject of congratulation, that this freshet occurred when the trade of the Canal was in its infancy; and the fact, that a freshet six feet higher than any ever known or attempted to be guarded against, should have done, comparatively, so little damage, cannot fail to give well founded confidence in the security of the Canal, when it is considered, that the points where two thirds of this damage was sustained, have been rendered secure against even a higher freshet, by the substitution of a heavy wall of masonry for the embankment carried away at Dam No. 6; and by raising the guard banks at the other points several feet higher than the level of the freshet, and paving and rip rapping them.[97]

Superintendent D. O. Oliver of the Hancock Division recommended to the Board on August 5, 1857, that repairs be made to the foundations of the abutments of Dam No. 6 during the winter. As the bridge across the mouth of the feeder was "decayed and unsafe", he also urged the construction of a new towing bridge.[98]

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[93] Fisk to Sterritt, Aug. 20, 1852 Drafts of Ltrs. Sent, Chief Engineer.
[94] Lowe to Fisk, Aug. 22, 1852 Ltrs. Recd., Chief Engineer.
[95] Fisk to Cole, Sept. 3, 1852, and Fisk to Parker, Sept. 9, 1852 Drafts of Ltrs. Sent, Chief Engineer.
[96] Myer to Board of Directors, Dec. 6, 1852 Ltrs. Recd., C&O Canal Co.
[97] *Twenty-Fifth Annual Report* (1853), C&O Co., pp. 8–9.
[98] *Proceedings of the President and Board of Directors*, I, p. 370. Also see, Ringgold to Oliver, Aug. 11, 1857 Ltrs. Sent, C&O Co. [Presumably this would be the bridge carrying the towpath over the feeder inlet immediately below Lock 45. —kg]

After inspecting Dam No. 6 in mid-August, Engineer and General Superintendent, T. L. Patterson reported to the board, that there had been no change in the condition of the abutments since the 1852 flood repairs. The abutments and wings of the dam had been built on foundations of rock and consequently had not settled. However, the headwalls of Guard Lock No. 6 and the feeder, which had been constructed on foundations of timber and had been "built up against but not connected with the wings of the Dam," had settled away from the wings from one to three inches at the top of the walls. Owing to the length of its span and to defective construction, the bridge across the mouth of the feeder had "settled very much". If the bridge were propped up with trusses, it would "be safe until the close of navigation when it had better be replaced". Because of the depth of water below the dam he could not examine the foundation of the crib work built to sustain the guard bank. For some distance above the water, the crib work appeared "tolerably sound."[99]

As national tensions increased during the fall and winter months of 1860–61, the Potomac Valley and the Chesapeake and Ohio Canal began to feel the impact of the grim struggle about to engulf the United States. When hostilities commenced in the spring of 1861, Union and Confederate armies confronted each other along the Potomac, and marauding soldiers subjected the canal to continual disruption. On July 6, 1861, General Superintendent A. K. Stake was warned of a threat by the Rebels to "blow down Dam No. 6".[100] Later, on October 20, Col. Angus W. McDonald, headquartered at Romney, Virginia, issued the following order:

> Col. E. H. McDonald will take all the mounted men of his command except those upon scout service, and with them, together with Captain Sheets' Co. of the Cavalry Regt., repair to the mouth of Big Cacapon, in the County of Morgan, and then proceed to destroy Dam No. 6, by digging around the abutment of sufficient ditch on the Va. shore to drain the Dam, and by such other means as may suggest to him as best to effect the destruction, confining his operations to the Va. shore. The necessary implements will be provided to accompany you. Having effected all you can towards the destruction of the Dam you will proceed to destroy the water stations of the B&Ohio R.R. as far up as the South Branch, or as many as you can convenient with a speedy return to this point with your command. Arriving there you will proceed to destroy the abutments of the Bridge thereof. On your arrival at Dam No. 6, and every 12 hours after, you will dispatch a courier to report your progress to Head Quarters (at Romney, Virginia). Upon your return you will report in writing your action under this order.[101]

During the summer of 1862 the Potomac Valley suffered from a severe drought. Complicating the problem was an "utter failure" of navigation at Dam No. 6, caused by a leak in the dam. Superintendent Lowe of the Cumberland Division soon began repairs, and when President Alfred Spates visited Dam No. 6 in late August, he found the work "getting along very well". To tighten the dam, Lowe put in an additional crib to keep the bank from washing.[102]

Engineer Hassett, on May 8, 1865, informed the board that Dam No. 6 needed ice guards. By putting "them on about 8 feet long and 2 ½ inches by 10 inches at [the] center of the dam", the

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[99] Patterson to Board of Directors, Aug. 31, 1887 Ltrs. Recd., C&O Co.
[100] Stake to Spates, July 6, 1861 Ltrs. Recd., C&O Co.
[101] This copy of these orders was found in an anonymous pamphlet, *To the People of Maryland: The Canal and Its Management Vindicated* (n.d.), Rare Book Division, Library of Congress. The orders were taken from the personal baggage of Col. Angus W. McDonald by Brigadier General B. F. Kelley at the capture of Romney. Available documentation indicates that the orders were never carried out.
[102] Greene to Ringgold, Aug. 4, 1862, and Spates to Ringgold, Aug. 26, 1862, Ltrs. Recd., C & O Co.

canal company would save itself the trouble of "putting on plank every season in order to raise the water". Every time the planks were put on, the top timbers of the dam were injured by "boring the holes to hold the plank". Often the planks would be washed away three or four times a season by sudden rises in the river. Thus, ice guards would not only protect the dam from a heavy ice freshet but would also preserve the timber work of the top of the dam from further deterioration. An added incentive to put on the ice guards was the fact that they would "raise the water about 10 inches."[103]

On December 1 Adam Faith requested that the board grant him permission to build a feed store at Dam No. 6. Accordingly, on December 14 the board allowed Faith to construct a feed store "under the direction of the Supt. of the Hancock Division, to continue during the pleasure of the Board, on paying rent therefore at the rate of $36 per ann. provided that no intoxicating liquors be sold on the premises."[104]

At the thirty-eighth annual meeting of the stockholders on June 4, 1866, Engineer and General Superintendent Charles P. Manning announced:

> Dam No. 6 is in general good condition, and regarded as a permanent structure, though formed of crib-work, filled with loose stones and sheathed with timber and planks, similar in most respects to Dam No. 3, but of better form and more substantial construction.[105]

In early September, Manning reported to the board on the condition of the canal. Among the repairs he recommended was the sheeting of Dam No. 6. Accordingly, the board directed the superintendent of the Hancock Division "to give early attention to sheeting of the dam."[106]

Engineer William R. Hutton, on July 12, 1870, submitted a report to the board on the repairs "required to place the canal in good condition". He recommended that ice guards be put on the abutments at Dam No. 6. The cost of the timber for these ice guards was estimated at $200.[107]

The stockholders were informed on June 2, 1873, by Engineer T. L. Patterson, that Dam No. 6 was in good condition. During the low water the previous fall, the "vertical sheathing of its downstream face" had been "thoroughly repaired". An examination of its foundation showed that it was not undermined as had been feared. Accordingly, there was good reason "to believe that this dam will last for many years."[108]

Near the end of the boating season, on November 24, 1877, another great flood swept down the Potomac Valley. This one was the worst in 150 years of recorded history of the region. In its wake it left the canal almost a total wreck and brought trade to an end for the season. The crest of the flood was generally two feet higher than the previous record established in 1852. Damage

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[103] Hassett to Board of Directors, May 8, 1865, Ltrs. Recd., C & O Co.
[104] *Proceedings of the President and Board of Directors*, K, p. 464.
[105] *Thirty-Eighth Annual Report* (1866), C & O Co., p. 8.
[106] *Proceedings of the President and Board of Directors*, K, p. 510.
[107] *Ibid*., L, p. 343.
[108] *Forty-Fifth Annual Report* (1873), C & O Co., p. 29.

was scattered along the entire line, but the middle section between Dam No. 4 and the Cacapon suffered the most.[109]

After inspecting the flood damage, President A. P. Gorman reported to the board on December 12. On the division extending from Cumberland to Lock 41 at the head of Big Slackwater he had found "14 breaks, many washes and some of the short levels are filled up from 12 inches to three feet in depth". Both abutments of Dam No. 6 were slightly damaged, while the abutments of Dam No. 5 suffered considerable injury. So that repairs would be completed as rapidly as possible, Superintendent Lewis G. Stanhope had been authorized "to employ sixty men on the repairs to Dams No. 5 & 6".[110]

On May 15, 1878, President Gorman was pleased to announce that owing to the mild winter "the damage to the Canal was so far repaired as to admit of the water being put on and navigation opened from Cumberland to Georgetown on the 15th day of April". The canal prism was "now in as good condition" as it had been for many years. Although the embankments and masonry were "not as substantial as they were before the flood", they could be strengthened and completed more economically "during the current year with the regular and a few extra repair hands".[111]

General Superintendent Stephen Gambrill, on October 5, 1881, reported to the board on the suspension of navigation at Dam No. 6 during the summer drought:

> The great drought did not affect the canal until the 6th of August when the water commenced falling very rapidly at Dam No. 6, causing the stoppage of loaded boats. On the 8th the water in the Canal had fallen nearly two feet. We immediately concentrated a large force at that point in order to tighten the dam as much as possible, the leakage being very great. We also started the Steam Pump [near Lock No. 72] but did not succeed in moving the boats until the 15th when we passed 208 boats. We reduced the draught of the boats from 5-3/4 ft. to 4-1/2 ft., but the water continued falling so rapidly that we found it impossible to move the boats regularly. We had therefore to resort to the plan of accumulating the water in the upper levels and getting the loaded boats in fleets when we could pass them over the lower levels by drawing from the upper ones; in this way we could pass a fleet every six or eight days. We continued in this way until the 19th of September when a good rain fell at Cumberland and the river rose sufficient to furnish the canal with an abundance of water for navigation.[112]

Because Dam No. 6 continued to hinder canal navigation during low-water periods, the company undertook a project in 1884 to ascertain the "real status" of its structural composition. A coffer dam was constructed on the Maryland side of the river and a 50-foot section of the dam was "exposed to view". It was found that the inner fabric of the structure looked like a "sieve". The dam was "fairly honey-combed, the holes varying from the size of a man's fist to that of his body". Company hands rebuilt this portion in "a most substantial manner". When the work was completed, two "more larger sections were rebuilt in the same excellent manner, the material selected being the best that could be had". About 200 feet of the old dam were "replaced by an entirely new structure", which was one foot higher than the old dam. All of the work was done under the

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[109] *Fiftieth Annual Report* (1878), C & O Co., p. 3. Also see *Proceedings of the President and Board of Directors*, N, pp. 11–13.
[110] Gorman to Board of Directors, Dec. 12, 1877, Ltrs. Recd., C & O Co.
[111] *Proceedings of the President and Board of Directors*, N, p. 23.
[112] *Ibid*., pp. 151–152.

direction of the General Superintendent and under the immediate supervision of Division Superintendent Lewis G. Stanhope.[113]

The reconstruction work appeared to solve the leaking problem, because it was reported that the dam caused little or no detention to boats during the draught in the summer of 1884. However, by 1885, there were signs that the dam was leaking badly, thereby causing a serious water loss. Hence company hands "tightened" the structure during the winter of 1885–86.[114]

On April 1, 1886, a devastating flood swept down the entire length of the upper Potomac Valley, tearing a great hole in Dam No. 6, and generally wreaking havoc along the waterway. Four days later another freshet widened the gap in the dam and added to the destruction of the canal proper. After a thorough survey of the damage at Dam No. 6, General Superintendent Gambrill informed the board that:

> There is 204 feet of the center of this dam carried away; the remaining portion on the Virginia side about 125 feet is almost a total wreck though standing. On the Maryland side there is about 150 ft. which was partially rebuilt two years ago [which] remains intact, but as the lower half of it is old and rotten it would be policy to take it out; in other words, it will require an entire new dam from abutment to abutment, they being in good condition.[115]

At the same time, G. W. Smith, a civil engineer, was hired by the canal company to examine Dam No. 6 and make recommendations as to its repair or reconstruction. In a report to Col. L. Victor Baughman, president of the canal company, Smith observed:

> The breach, proper, is 175 ft. long, 183 ft. from the Virginia side and 117 ft. from the Maryland side. [The] entire length of [the] dam [is] 475 ft. The old timber above the water line is entirely gone and the stone only held in place by the sheathing. An entire new dam will be required. If rebuilt it should be of sawed white oak [and not hewn as in old dam] and filled with broken stone instead of field stone or stone from the river bottom which have been worn smooth by the action of the water, which latter fact was the cause of so much leakage in the dam. From a hasty examination I estimate it will cost about Fifty Thousand ($50,000) dollars to rebuild the dam, though a more thorough inspection at low water may increase or decrease the aforementioned amount. The estimate of "Engr. Fish" to build the dam and guard walls was Ninety One [Thousand] ($91,000) dollars. Comparing it with similar work in Kentucky, the abutments would cost double as much as [the dam] in Licking Creek or about $28,000. The dam must be rebuilt to insure a supply of water for navigation.[116]

On April 27 the board took up for consideration the matter of what should be done at Dam No. 6. It was decided "to engage Mr. Robert M. Martin, the Water engineer of the City of Baltimore, to prepare as soon as practicable, proper plans, specifications and estimates for the rebuilding of dam no. 6". If the plans, specifications and estimates were satisfactory, President Baughman would be authorized "to issue proposals for the rebuilding of said dam no. 6 after proper advertisement thereof". Before any proposal was accepted, the prospective contractor would be required to provide "good and sufficient Bond" for the execution of the work. To raise funds for the reconstruction of Dam No. 6 and the repair of the canal sections destroyed by the recent

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[113] *Fifty-Sixth Annual Report* (1884), C & O Co., p. 11.
[114] *Fifty-Eighth Annual Report* (1886), C & O Co., p. 23.
[115] *Proceedings of the President and Board of Directors*, N, p. 331.
[116] *Ibid*., p. 332, and *Fifty-Eighth Annual Report* (1886), C & O Co., pp. 15–17, 23–26.

freshets, the board authorized Baughman "to advertise for sale in the *Baltimore Sun*, *Baltimore American* and *Washington Star*, bonds of this Company issued under the [Maryland] Act of 1878, chap. 58, to the amount of one hundred thousand dollars."[117]

Before reconstruction work could begin on Dam No. 6, a third flood on May 9 widened the hole in the dam to 237 feet and added fresh damage to the canal.[118] Under the immediate supervision of Samuel D. Young of Cumberland, the dam was rebuilt during June and July. In a report submitted to President L. Victor Baughman on December 13, 1886, Young described the damage inflicted on the dam and the steps taken to reconstruct it:

> . . . The dam is 517 feet between abutments; 58 feet wide and 22-1/2 feet high to the crest. It is constructed of timber fastened together with long spike bolts. The space between the timbers being filled with loose stone, and the whole exterior covered with 3-inch and 6-inch sheathing boards. The gap or breach was 237 by width of dam, and, in addition to this, it was found necessary to tear out and rebuild the back or upper half of the 150 feet of old work left standing on the West Virginia side on account of its decayed condition. The work was commenced June 9th, and the gap closed and the water turned into the Canal July 15th; 225 men being employed including mechanics and laborers. It was also found necessary, in order to get a free flow of water into the Canal, to clean out the sediment which had collected in front of the feeder lock, amounting to about 1,000 cubic yards, and to rebuild about 100 feet of wing wall extending up the river from [the] mouth of [the] feeder. This was all done before the water was turned in the Canal. The dam was raised through its entire length two and a-half feet higher than the old dam, which had, no doubt, settled considerable from its original Height.
>
> The work of completing the dam after the water was turned in consisted of building up and sheathing the front or lower side and building about 150 feet of wing cribbing extending down the river from the Maryland abutment. The entire work was completed about the 10th of August. The principal items of material used in repairing the work were 800,000 feet of timber; 14,000 perches of stone; and 35 tons of iron spike bolts. The backing above the dam is clay, which was dug from the slopes of the river bank with the Company's steam dredge and hauled out in scows. There is about 5,000 yards of this filling, which makes the dam very tight.[119]

Between May 30 and June 1, 1889, disaster again struck the canal. A titanic flood swept down the Potomac, the crest of which was higher than any ever before recorded in the history of the valley. At Hancock, some ten miles below Dam No. 6, the water reached a point 3 feet above the previous records set in 1877. The damage caused by the rampaging river was fully as impressive as the record heights established by the flood. The damage included the partial destruction of Dam No. 6, in which the sheathing on the downstream slope was torn loose for about 160 feet from the Maryland abutment towards the center of the structure. The sheathing had been detached from the timbers on the front face of the dam. Many of the timbers on the front face had been washed away. About 100 feet of stone-filled cribwork had been destroyed. However, the

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[117] *Proceedings of the President and Board of Directors*, N, pp. 335–36.
[118] *Fifty-Ninth Annual Report* (1887), C & O Co., p. 25.
[119] *Ibid*., Appendix C, pp. 31–32. The cost of rebuilding the dam was $45,335.67, or about $10,000 less than the engineer's estimate, and $15,000 to $20,000 less than any proposal received from private contractors. *Proceedings of the President and Board of Directors*, N, p. 338.

upper slope of the dam and the ice guards were uninjured. The estimated cost of the necessary repairs for the dam was set at $10,850.[120]

The flood of 1889 forced the canal company to go into receivership, with the Baltimore and Ohio Railroad emerging as the majority owner of the canal bonds. Under the railroad, trustees were appointed, and the canal entered its last period of operation. In 1924, after the railroad had captured almost all of its carrying trade, the Chesapeake and Ohio Canal ceased to operate. While documentary data in the C & O Canal Company records dealing with maintenance and reconstruction problems for the period 1850-89 is sketchy, there is virtually no information dealing with these subjects for the years 1889-1924. All that can be determined is that Dam No. 6 was back in service in 1891, and secondary sources such as Sanderlin indicate that the canal operated under the railroad's management much as it had in previous years.

While the flood of 1924, which ended operation of the canal, did little damage to Dam No. 6, the great freshets of 1936 and 1942 turned the structure into the pile of rubble one sees today. In March 1936 the torrent of water in the Potomac washed away nearly half of Dam No. 6, leaving only a portion of the structure on the Maryland side still standing. The concrete protection wall below the dam was undermined, and fifteen feet of embankment on the towpath side of Guard Lock No. 6 was washed out. The top of the towpath below the railroad bridge at the dam was badly washed, and Lockhouse No. 55 was swept off its foundation.[121]

Today Dam No. 6 is in a state of ruin. Both of its abutments are still standing, but floodwaters have washed rock rubble into a corkscrew rapids with a clear channel on the Virginia side of the river. The portion of the dam that still extends out into the river from the Maryland abutment consists of rubble rock and washed-in debris covered with scrub brush and growing trees.[122]

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[120] Special Report of the President and Directors, June 13, 1889, to the 61st Annual Meeting, in Circuit Court for Washington County (Md), *George S. Brown et al. v. Chesapeake and Ohio Canal Company* (Equity No. 4191), pp. 6–9. Also see 2nd Report of Receivers in *George S. Brown et al. v. Chesapeake and Ohio Canal Company* (Equity Nos. 4191 and 4198), pp. 111–33, and Report of T. L. Patterson, J. P. Kingsley and Major Henry D. Whitcomb to Receivers, June 9, 1890, in Receivership Papers, Washington County Courthouse, Hagerstown, Md.

[121] Shiva to Nicholson, and Sterling to Nicholson, Mar. 22, 1936, Correspondence of Office of Trustees.

[122] Thomas F. Hahn, *Towpath Guide to the C & O Canal (Section Four)* (Washington, 1973); the author of this report also made a personal inspection of the Dam No. 6 complex on November 28, 1974.

APPENDIX

Payments Made by the Company for the Construction
Of Dam No. 6 and It's Associated Structures

Dam No. 6

Hollman & Reynolds, Contractor

Debit			Credit		
1837			1837		
Apr. 7	To Geo. Bender, Comm.	$5,500.00	Sept. 1	To Construction	$5,919.60
Sept. 14	To Geo. Bender, Comm.	4,735.68	Nov. 1	To Construction	8,146.92
Nov. 14	To Geo. Bender, Comm.	6,517.54	Dec. 15	To Construction	2,086.80
Dec. 18	To Geo. Bender, Comm.	1,669.44			
1838			1838		
May 15	To Geo. Bender, Comm.	2,200.00	May 1	To Construction	2,750.00
June 14	To Thos. Fillebroun, Comm.	914.67	June 12	To Construction	8,018.34
July 13	To Thos. Fillebroun, Comm.	2,019.12			$26,921.66
1839			1839		
Jan. 14	To Thos. Fillebroun, Comm.	600.00	Dec. 28	To Sundries	9,245.71
		$24,156.45			
1840					
Jan. 4	To Rob. Barnard, Treas.	2,139.65			
Jan. 4	To Acceptances	4,700.00			
1839					
Dec. 28	To J. R. Young	4,763.63			
Dec. 28	To J. A. Byers	407.64			
		$36,167.37			$36,167.37

Dam No. 6

J. R. Young, Superintendent of Dam No. 6

Debit			Credit		
1838					
Oct.	To M. C. Sprigg, Comm.	$4,000.00			
Nov.	To M. C. Sprigg, Comm.	4,324.35			
Dec.	To M. C. Sprigg, Comm.	1,675.65			
1839			1839		
Jan. 14	To M. C. Sprigg, Comm.	2,976.11	Dec. 28	To Construction	$15,976.11
Feb.	To M. C. Sprigg, Comm.	3,000.00			
		$15,976.1			$15,976.1

Dam No. 6

John A. Byers, Engineer in Charge of Sam No. 6

Debit			Credit		
Mar. 25	To M. C. Sprigg, Comm.	$2,000.00			
June 18	To M. C. Sprigg, Comm.	1,000.00			
Dec. 28	To J. R. Young	3,121.00			
		$7,081.00			
1839			1839		
Dec. 28	To Balance	9.86	Dec. 28	To Sundries	$7,071.14
			Dec. 28	To Balance	9.86
					$7,081.00
			Dec. 28	To J. A. Byers	9.86

Guard Bank to Dam No. 6 (Virginia)

George Weaver, Contractor

Debit			Credit		
1838			1838		
Apr. 21	To Geo. Bender, Comm.	$1,869.60	Apr. 1	To Construction	$2,337.00
July 5	To Thos. Fillebroun, Comm.	1,829.09	July	To Construction	1,361.69
		$3,698.69			$3,698.69

Abutments to Dam No. 6 and Guard Lock No. 6
George Weaver, Contractor

Debit			Credit		
1836			1836		
Nov. 17	To Geo. Bender, Comm.	$212.00	Nov. 1	To Construction	$265.00
Dec. 12	To Geo. Bender, Comm.	303.11	Dec. 1	To Construction	497.50
Dec. 12	To Cement (379 Bushels)	94.89			
1837			1837		
Jan. 14	To Geo. Bender, Comm.	512.00	Jan. 1	To Construction	640.00
Feb. 13	To Geo. Bender, Comm.	1,100.00	Feb. 1	To Construction	1,375.00
Mar. 14	To Geo. Bender, Comm.	502.40	Mar. 1	To Construction	628.00
Apr. 8	To Geo. Bender, Comm.	1,039.60	Apr. 1	To Construction	1,299.50
May 9	To Geo. Bender, Comm.	1,981.28	May 1	To Construction	2,985.90
May 9	To Cement (1,629 Bushels)	407.44	June 1	To Construction	3,111.25
June 12	To Cement (1,394 Bushels)	348.64	July 1	To Construction	3,026.10
June 12	To Geo. Bender, Comm.	2,140.36	Aug. 1	To Construction	3,867.95
July 13	To Geo. Bender, Comm.	1,614.04	Sept. 1	To Construction	4,410.00
Aug. 9	To Geo. Bender, Comm.	2,500.00	Oct. 1	To Construction	3,658.00
Aug. 9	To Cement (5,604 Bushels)	1,401.20	Nov. 1	To Construction	3,235.85
Sept. 12	To Geo. Bender, Comm.	2,965.44	Dec. 1	To Construction	4,196.61
Sept. 12	To Cement (2,250 Bushels)	562.56			
Oct. 16	To Cement (1,599 Bushels)	399.88			
Oct. 16	To Geo. Bender, Comm.	2,526.52			
Nov. 14	To Geo. Bender, Comm.	2,297.16			
Nov. 14	To Cement (1,166 Bushels)	291.53			
Dec. 15	To Geo. Bender, Comm.	3,021.92			
Dec. 15	To Geo. Bender, Comm.	3,319.66			
Dec. 15	To Cement (1,341 Bushels)	335.36			
1838			1838		
Jan. 31	To Geo. Bender, Comm.	854.40	Jan. 1	To Construction	1,068.00
Mar. 6	To Geo. Bender, Comm.	873.00	Feb. 1	To Construction	1,091.25
Apr. 17	To Geo. Bender, Comm.	426.00	Mar. 1	To Construction	532.50
Apr. 17	To Geo. Bender, Comm.	500.00	Apr. 1	To Construction	750.00
May 12	To Geo. Bender, Comm.	2,983.13	May 1	To Construction	3,960.00
May 12	To Cement (1,139 Bushels)	284.87	June 1	To Construction	3,050.15
June 13	To Thos. Fillebroun, Comm.	2,315.12	July 31	To Construction	2,900.02
June 13	To Cement (500 Bushels)	125.00			
Oct. 20	To M. C. Sprigg, Comm.	8,157.26			
Oct. 20	To Cement (611 Bushels)	152.80			
		$46,548.58			$46,548.58

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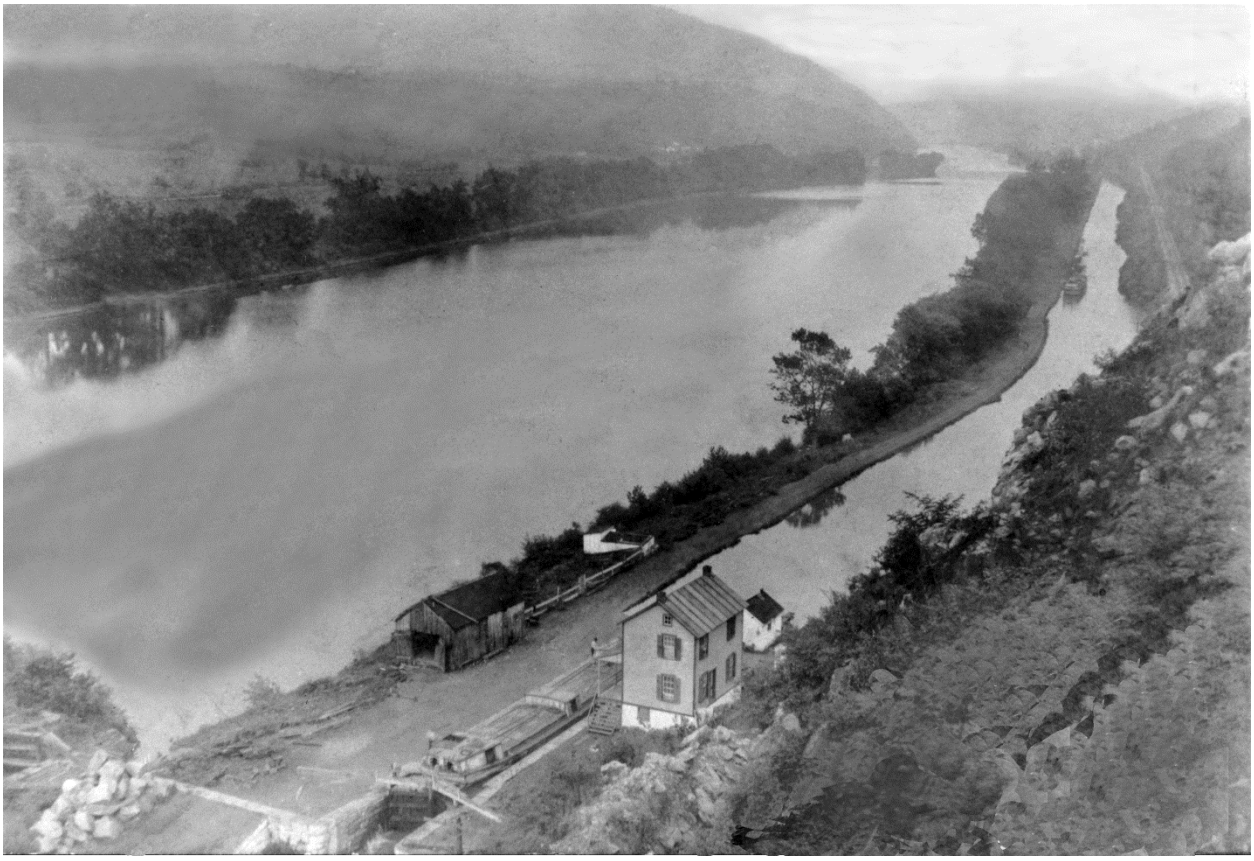
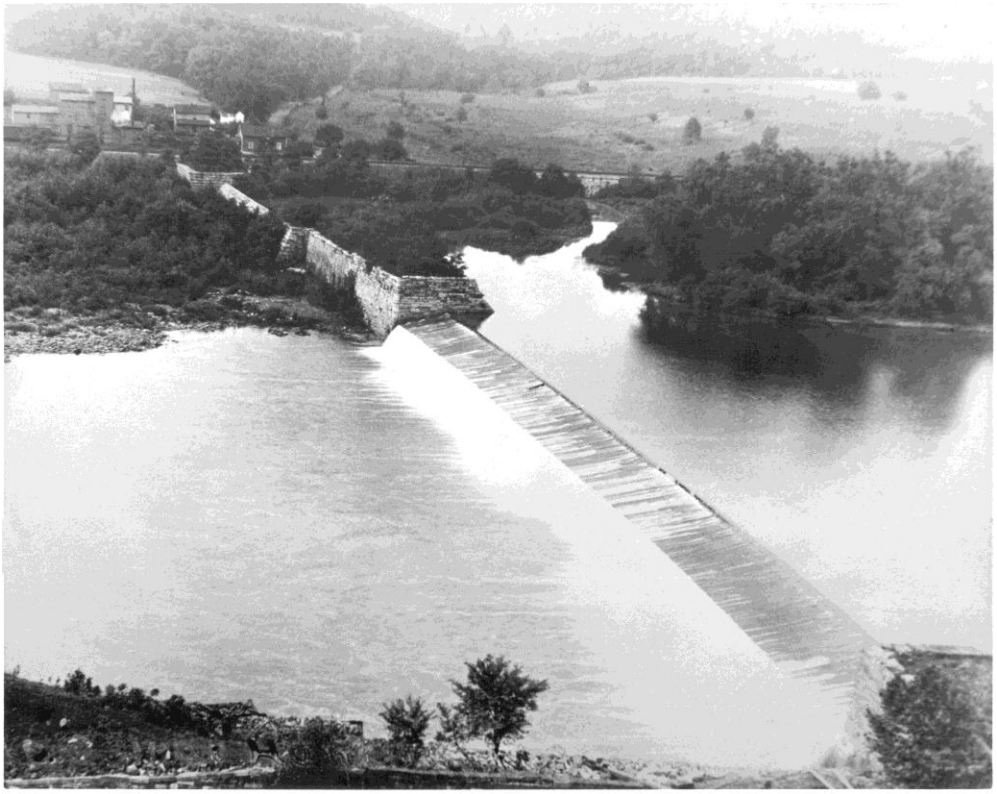


1. Dam No. 6 Inlet in the lower left with Lock No. 55 and Lockhouse in lower center.

2. Dam No. 6, Looking toward the West Virginia Abutment.

3. Dam No. 6, From West Virginia abutment with Maryland abutment, lockhouse, lock shanty, and other structures at Lock No. 55.

4. Dam No. 6 with Inlet Lock and abutment and wall on the West Virginia side.

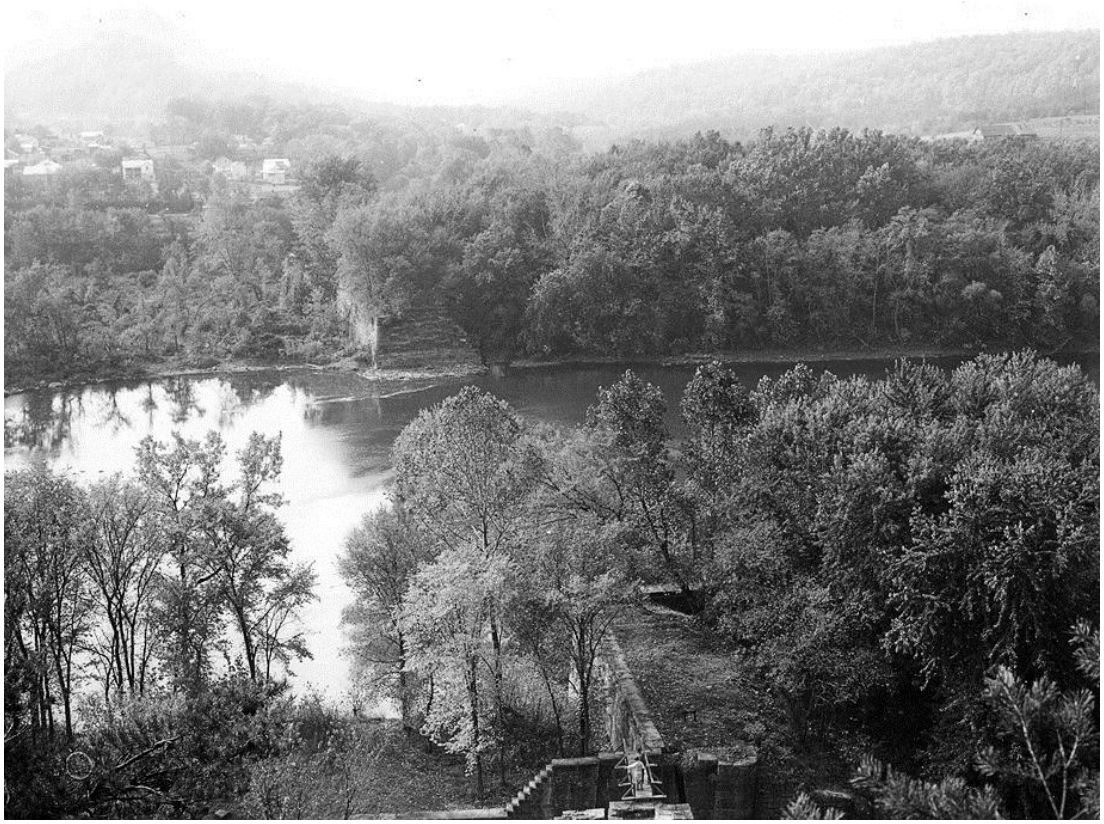


5. Dam No. 6 and West Virginia abutment and guard wall.

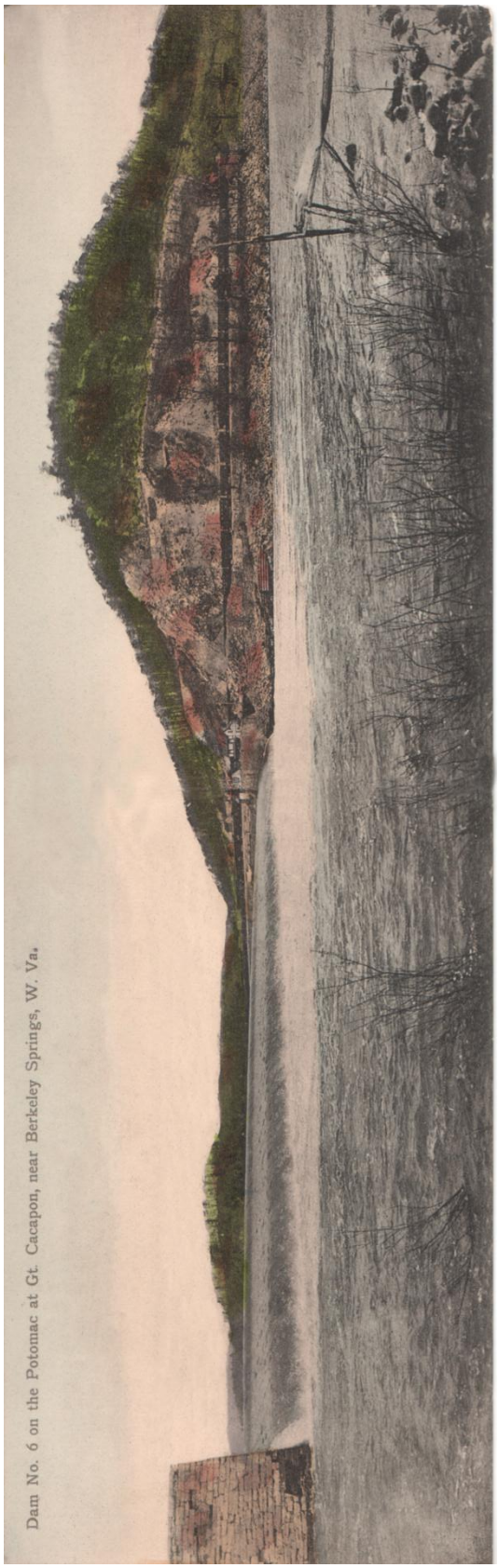
6. Dam No. 6, 1938, from the West Virginia side, showing interior construction.

7. Dam No. 6, downstream face with section of missing planks sheathing.

8. Dam No. 6 and Inlet Lock 6, Winter of 1960



9. Dam No. 6 abutments, dam entirely gone with woodland on both sides.



10. Folding postcard of Dam No. 6 with the Western Maryland RR on the berm side of the canal. Early 20th Century.

11. Top of abutment and guard wall, West Virginia side, Dam No. 6.

12. Guard wall on West Virginia side, Dam No. 6.

13. Top of the West Virginia guard wall at Dam No. 6.

14. Dam No. 6 Maryland abutment from upstream.

15. Dam No. 6 Maryland abutment from downstream

16. Dam No. 6 West Virginia abutment from downstream.

17. Dam No. 6 Maryland abutment from downstream.

18. Dam No. 6 Maryland abutment, Inlet Lock, and Lock 55.

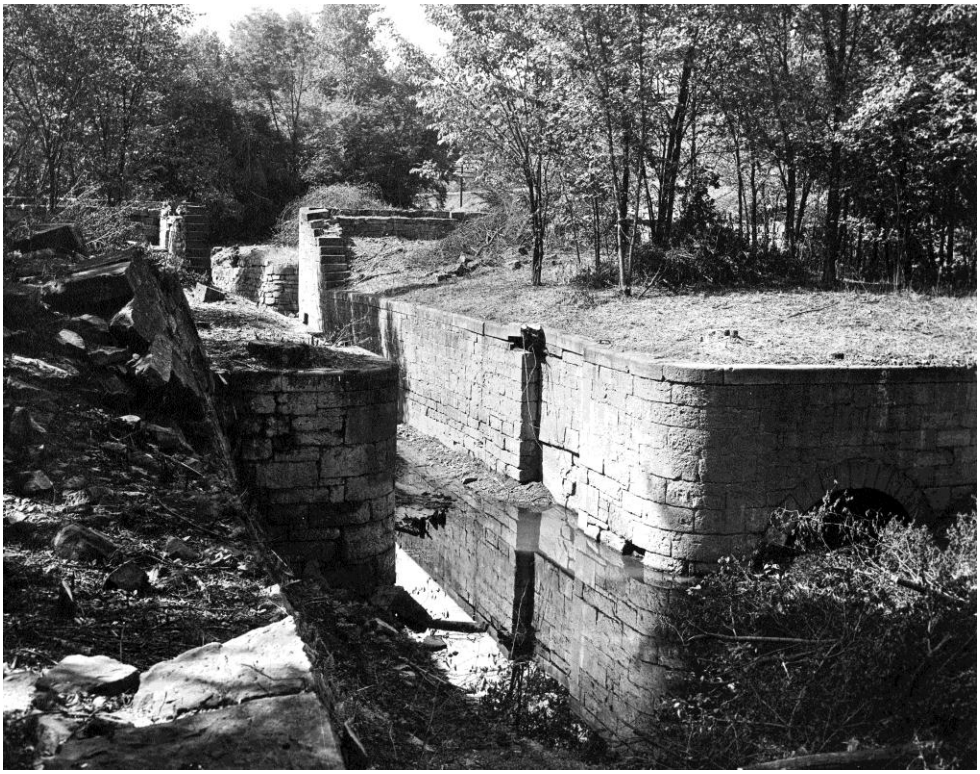
19. Dam No. 6 abutment guard wall and upstream end of Inlet Lock No. 6.

20. Inlet Lock No. 6, guard wall (upstream) end.

21. Inlet Lock No. 6 looking upstream at the guard wall end.

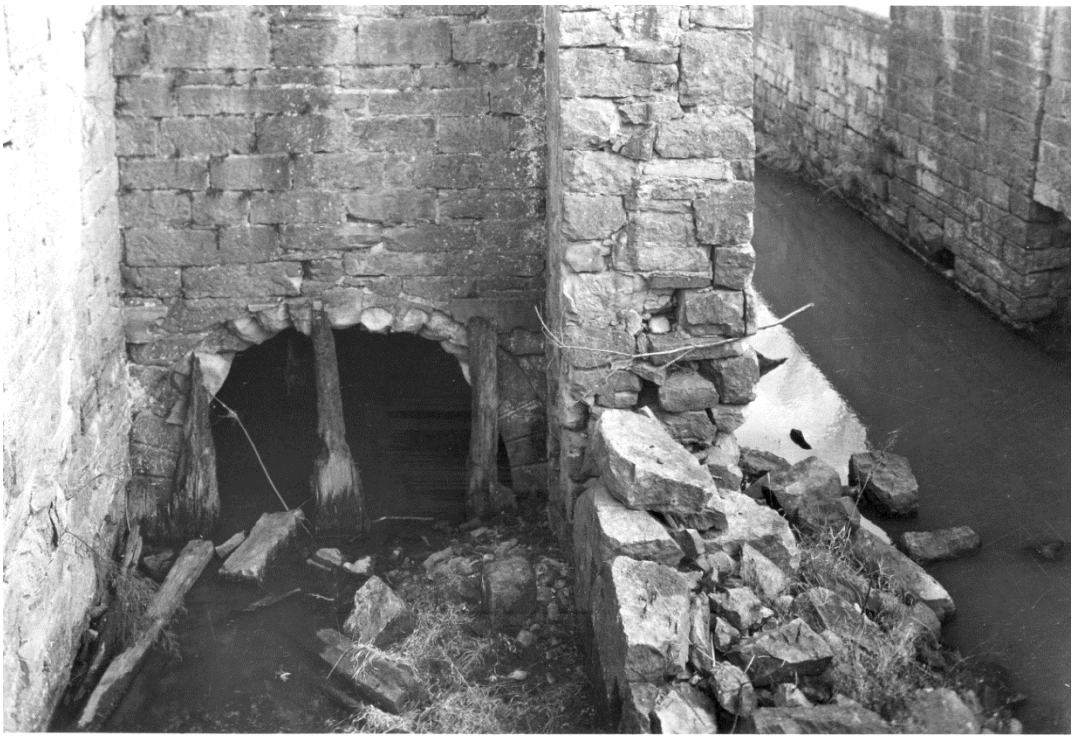
22. Inlet Lock No. 6 from upstream end, and inlet channel.

23. Looking down Inlet Lock No. 6 and masonry wall above the lock.



24. Inlet Lock No. 6 from inlet channel.

25. Bypass structure at the upstream end of Inlet Lock No. 6.

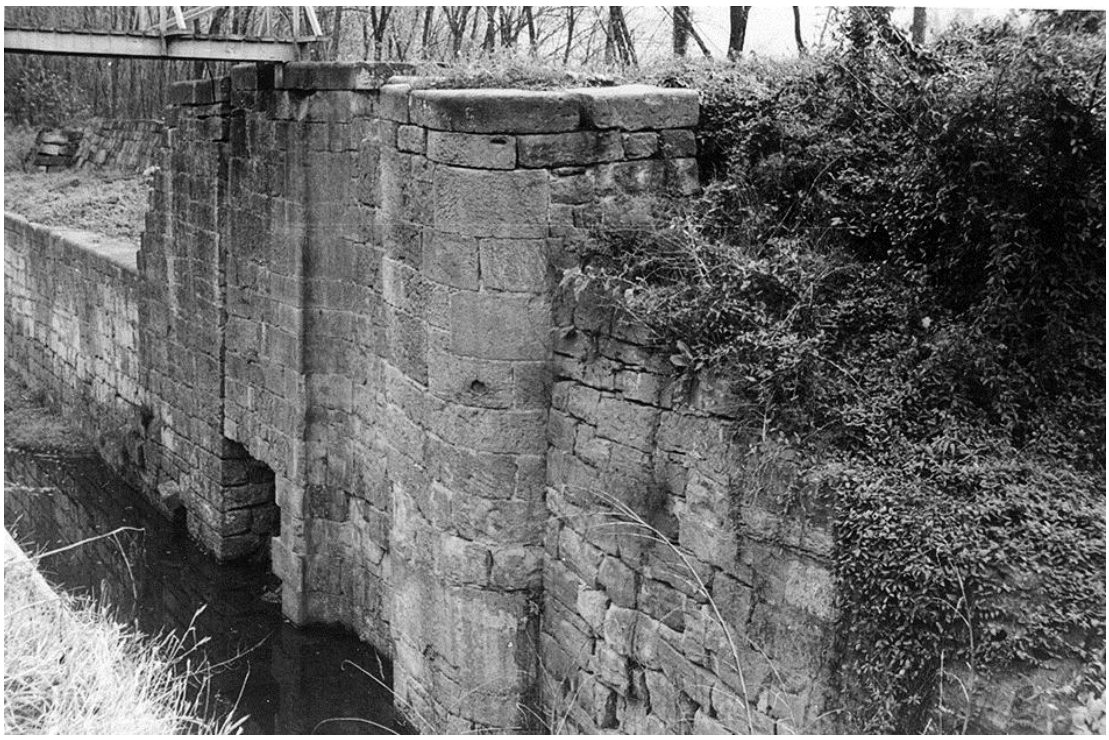


26. Bypass structure at the upstream end of Inlet Lock No. 6.

27. Bypass structure at the upstream end of Inlet Lock No. 6.

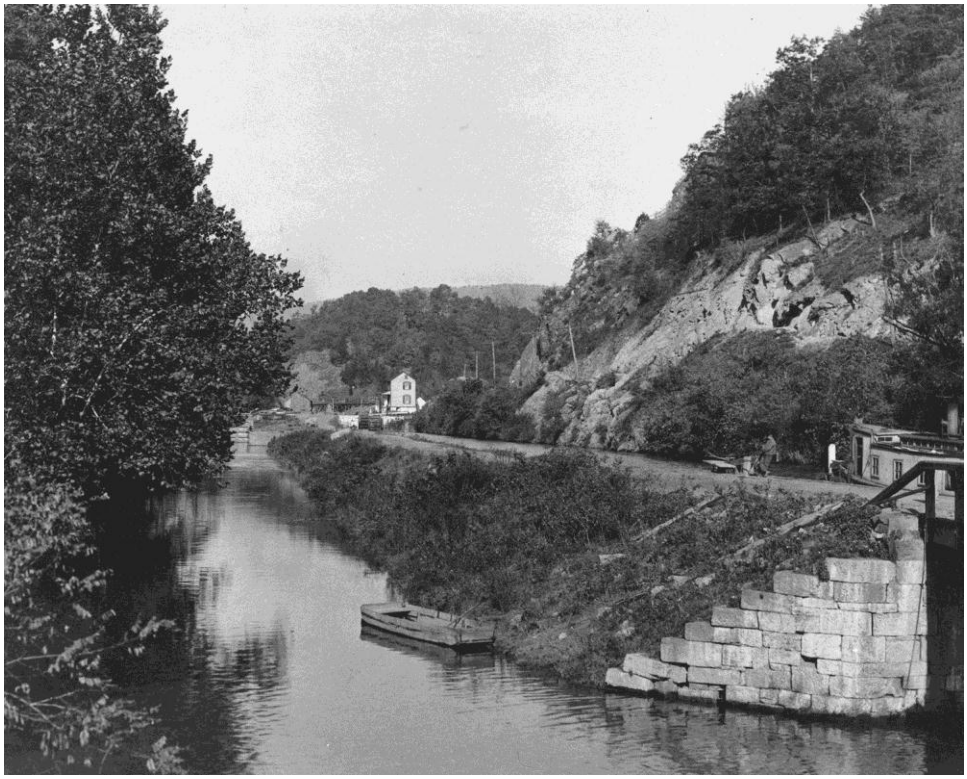
28. Bypass structure at the downstream end of Inlet Lock No. 6.

29. Diagonal break in abutment of Inlet Lock No. 6.



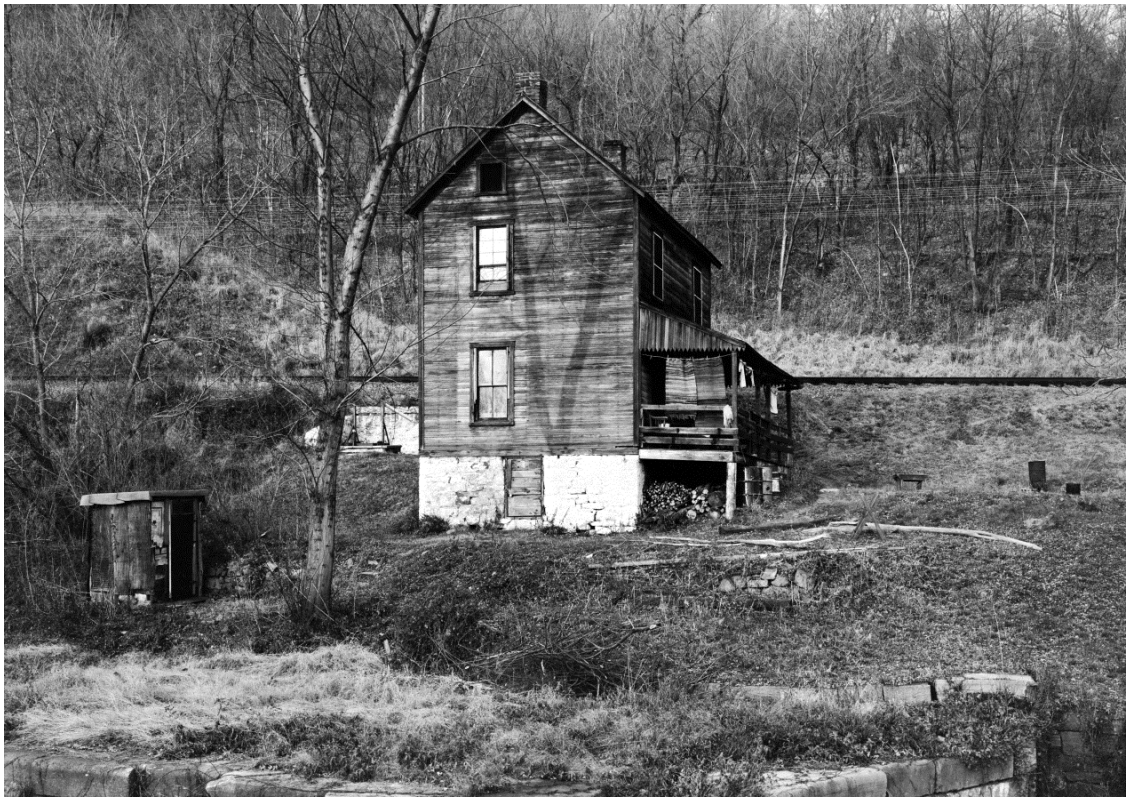
30. Upstream river-side abutment of Inlet Lock No. 6.

31. Inlet Lock No. 6 with towpath, Lock 55, and W.MD.RR on the right.



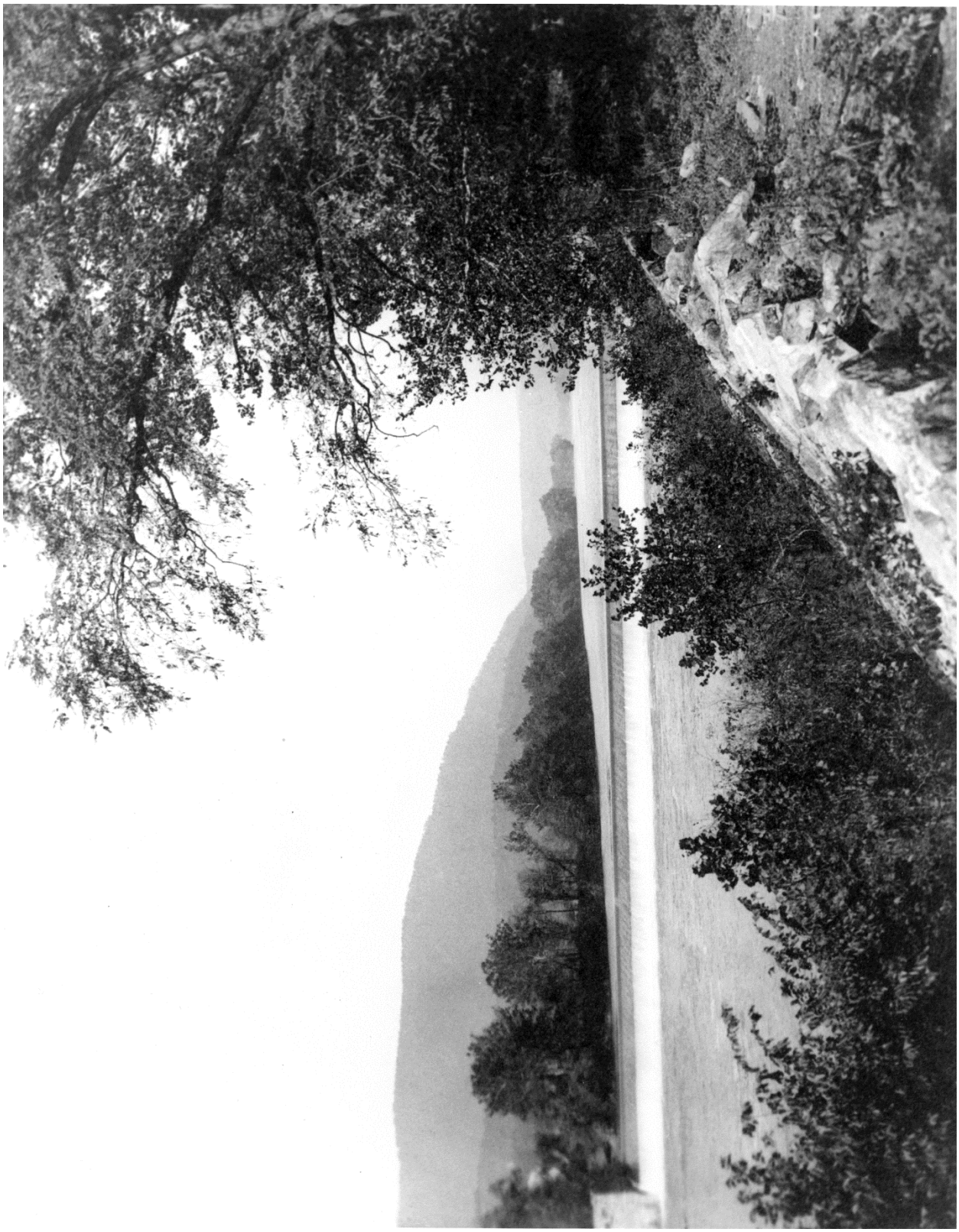
32. Inlet channel at conjunction with the main stem of the canal.
Note boat in Lock No. 54 and upstream end of mule crossover bridge.

33. Below Lock No. 55 with Lockhouse in the background.



34. Lockhouse at Lock 55 with W.MD.RR beyond.

35. Lock No. 55 looking toward the inlet lock from the WMRR.



36. Dam No. 6 from downstream.

37. Road on the bluff above Dam No. 6.