UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5

IN THE MATTER OF:	)	**Docket No. CWA-05-2008-0002**
	)	
Arclar Company, LLC,	)	**Proceeding to Assess Class II**
Black Beauty Coal Company, LLC	)	**Administrative Penalty under Section**
7100 Eagle Crest Boulevard	)	**309(g) of the Clean Water Act, 33 U.S.C.**
Evansville, IN 47715	)	**§ 1319(g)**
	)	
Respondent.	)	

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CONSENT AGREEMENT AND FINAL ORDER

1. This is an administrative action commenced and concluded under Section 309(g) of the Clean Water Act (Act), 33 U.S.C. § 1319(g), and Sections 22.13(b) and 22.18(b) of the Consolidated Rules of Practice Governing the Administrative Assessment of Civil Penalties and the Revocation/Termination or Suspension of Permits (Consolidated Rules), 40 C.F.R. §§ 22.13(b) and 22.18(b).

2. Complainant is the Director of the Water Division, United States Environmental Protection Agency, Region 5 (Complainant or U.S. EPA).

3. Respondent is Arclar Company, LLC of Equality, Illinois, a subsidiary of Black Beauty Coal Company, LLC ("Respondent" or "Arclar Company, LLC/BBCC") ,a corporation doing business in the State of Indiana.

4. Where the parties agree to settle one or more causes of action before the filing of a complaint, the administrative action may be commenced and concluded simultaneously by the issuance of a Consent Agreement and Final Order (CAFO). 40 C.F.R. § 22.13(b).

5. The parties agree that settling this action without the filing of a complaint or the adjudication of any issue of fact or law is in their interest and in the public interest.

6. Respondent consents to entry of this CAFO and the assessment of the specified civil penalty, and agrees to comply with the terms of the CAFO and further agrees that it will not contest the basis or validity of this CAFO or its terms. Respondent, however, does not admit, and retains the right to controvert in any subsequent proceedings other than proceedings to implement or enforce this CAFO, the validity of the factual allegations or alleged violations in this CAFO, including, without limitation, any allegations regarding the presence of jurisdictional "waters of the United States" at the Respondent's Wildcat Hills/Cottage Grove Pit Mine.

Jurisdiction and Waiver of Right to Hearing

7. Respondent admits the jurisdictional allegations in this CAFO, but denies the factual allegations or alleged violations set forth herein.

8. Arclar Company, LLC/BBCC waives its right to request a hearing as provided at 40 C.F.R. § 22.15(c) and Section 309(g)(2)(B) of the Act, 33 U.S.C. § 1319(g)(2)(B), any right to contest the allegations in this CAFO, and its right to appeal this CAFO under Section 309(g)(8)(B) of the Act, 33 U.S.C. § 1319(g)(8)(B).

9. In consideration of the alleged violations, the environmental and compliance significance of the matter, and based upon the nature, circumstances, extent and gravity of the violations alleged herein, as well as Respondent's ability to pay, prior history of such violations, culpability, economic benefit or savings (if any) resulting from the violations, and such other matters as justice may require, Complainant has determined that an appropriate civil penalty to settle this action is in the amount of twenty-five thousand dollars ($25,000). The Respondent shall pay the $25,000 civil penalty as specified below. The Respondent shall also successfully perform a Supplemental Environmental Project (SEP) valued at $97,448, as described below.

Respondent's payment of the penalty and performance of the SEP shall not constitute an admission of any liability.

Statutory and Regulatory Background

10. Section 301 of the Act, 33 U.S.C. § 1311, prohibits the discharge of pollutants into "waters of the United States" except in compliance with, among other things, a permit issued under Section 404 of the Act, 33 U.S.C. § 1344.

11. Section 404 of the Act, 33 U.S.C. § 1344, authorizes the Secretary of the Army, acting through the Chief of Engineers, U.S. Army Corps of Engineers (Corps), to issue permits for the discharge of dredged or fill material into "waters of the United States."

12. Section 502(12) of the Act, 33 U.S.C. § 1362(12), defines "discharge of pollutants" as "any addition of any pollutant to navigable waters from any point source...."

13. Section 502(14) of the Act, 33 U.S.C. § 1362(14), defines a "point source" as "any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation or vessel or other floating craft, from which pollutants are or may be discharged."

14. Section 502(6) of the Act, 33 U.S.C. § 1362(6), defines "pollutant" as "dredged spoil, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, and industrial, municipal, and agricultural waste discharged into water."

15. Section 502(7) of the Act, 33 U.S.C. § 1362(7), defines "navigable waters" as "the waters of the United States...."

16. 40 C.F.R. § 230.3 defines the term "waters of the United States" to include certain "wetlands" and "streams."

Factual Allegations and Alleged Violations

17. Respondent, which owns the Wildcat Hills/Cottage Grove Pit Mine ("Mine") in Gallatin and Saline Counties, Illinois, is an Illinois subsidiary of BBCC, a corporation incorporated under the laws of Indiana. See Map of the Mine attached as Exhibit 1.

18. Respondent is a "person" under Section 502(5) of the Act, 33 U.S.C. § 1362(5).

19. Respondent has been conducting surface coal mining and reclamation activities at the Mine since 1998 pursuant to an approved Surface Mining Control and Reclamation Act ("SMCRA") permit as subsequently amended from time to time. At certain sites, including the Mine, mining operations authorized under Respondent's approved SMCRA permits involve temporary impacts to ditches, streams, tributaries and other drainage features, which are mined-through and subsequently replaced during Respondent's reclamation activities.

20. Between January 2000 and May 1, 2008, Respondent mined-through or otherwise impacted or will have mined through or impacted with its earth moving equipment certain agricultural ditches, streams or other tributaries to the North Fork of the Saline River – which abuts the Mine on its east border - during mining operations under its SMCRA permits. During the time period March 2003 through May 1, 2008, it is estimated that approximately 18,568 linear feet of such ditches, streams and tributaries have been or will be directly impacted by Respondent's mining operations. In addition, during the time period January 2000 through April 1, 2008, it is estimated that approximately 3,141 linear feet of such ditches, streams and tributaries have been or will be indirectly impacted by Respondent's mining operations.

21. All Mine site waters drain to the North Fork of the Saline River. The North Fork of the Saline River is traditionally navigable water.

22. The fill deposited in the abovementioned ditches, streams, and tributaries during Respondent's mining operations is a "pollutant" as defined in Section 502(6) of the Act, 33 U.S.C. § 1362(6).

23. Respondent used earth moving equipment to deposit the fill.

24. The earth moving equipment is a "point source" as defined at Section 502(14) of the Act, 33 U.S.C. § 1362(14).

25. The depositing of fill material constitutes the "discharge of pollutants" as defined at Section 502(12) of the Act, 33 U.S.C. § 1362(12).

26. In December of 2004, the Corps requested the pursuit of after-the-fact permitting under Section 404 of the Act, 33 U.S.C. § 1344, for these ditches, streams, tributaries. The Corps assigned ID # 200600453-kam to this Section 404 permit application upon submittal by Respondent in response to this request.

27. At no time when Respondent impacted the abovementioned ditches, streams, tributaries (in the context of a variety of communications and conversations between Respondent and the Corps that led to an apparent presumption regarding the absence of any permitting obligations and approval to proceed with mining activities) had Respondent received authorization through a permit issued under Section 404 of the Act, 33 U.S.C. § 1344.

28. Each discharge by Respondent of pollutants into "waters of the United States," as described in paragraph 20, above, that is not authorized by a permit issued under Section 404 of the Act, 33 U.S.C. § 1344, constitutes a day of violation of Section 301(a) of the Act, 33 U.S.C. § 1311(a).

29. Each day the material discharged by Respondent remains in "waters of the United States" without authorization of a permit issued under Section 404 of the Act, 33 U.S.C. § 1344, constitutes a day of violation of Section 301 of the Act, 33 U.S.C. § 1311.

Civil Penalty

30. In consideration of Respondent's good faith and cooperation in settling this matter, U.S. EPA agrees to a penalty of $25,000.

31. Respondent must pay the $25,000 civil penalty by cashier's or certified check payable to the "Treasurer, United States of America," within 30 days after the effective date of this CAFO.

32. Respondent must send the check to:

US Environmental Protection Agency
Fines and Penalties
Cincinnati Finance Center
PO Box 979077
St. Louis, MO 63197-9000

33. A transmittal letter, stating Respondent's name, complete address, the case docket number, and the billing document number must accompany the payment. Respondent must write the case docket number and the billing document number on the face of the check. Respondent must send copies of the check and transmittal letter to:

Attn: Regional Hearing Clerk
U.S. Environmental Protection Agency, Region 5
77 West Jackson Blvd. (E-13J)
Chicago, Illinois 60604-3590

Gregory T. Carlson, Enforcement Officer
U.S. Environmental Protection Agency, Region 5
77 West Jackson Blvd. (WW-16J)

Chicago, Illinois 60604-3590

Thomas Turner
Office of Regional Counsel
U.S. Environmental Protection Agency, Region 5
77 West Jackson Blvd. (C-14J)
Chicago, Illinois 60604-3509

34. This civil penalty is not deductible for federal tax purposes.

35. On any amount that may become overdue under Paragraph 30, interest will accrue at the rate established by the Secretary of the Treasury pursuant to 31 U.S.C. § 3717. In addition, late payment will be subject to nonpayment penalties in accordance with Section 309(g)(9) of the Act, 33 U.S.C. § 1319(g)(9).

SUPPLEMENTAL ENVIRONMENTAL PROJECT

36. In addition to the civil penalty described in Paragraph 30, Respondent shall also initiate, perform and complete the SEP for forested wetland creation valued at $97,448, by implementing the Scope of Work attached hereto as Attachment A which has been reviewed and approved by U.S. EPA. The attached Scope of Work also satisfies Respondent's obligation to perform and complete a SEP as set forth in the CAFOs entered by the parties to resolve the administrative actions referenced in Docket No. **CWA-05-2008-0002**

37. Failure to properly perform the SEP, or failure to meet the agreed upon success standards for the SEP as set forth in the Scope of Work, may result in Stipulated Penalty liability for the Respondent. Subject to the provisions of Paragraph 52 of this CAFO, a stipulated penalty in an amount of $10,000 per violation may be assessed against Respondent for failure to meet the following project milestones:

(a) The completion of grading, seeding and tree planting of 18 acres of the wetlands as more fully described in Attachment A hereto by not later than October 31, 2009; and

(b) The completion of grading, seeding and tree planting of the remaining 18 acres of the wetlands and the 5 acre buffer as more fully described in Attachment A hereto by not later than October 31, 2010.

Subject to the provisions of Paragraph 52 of this CAFO, a stipulated penalty in the amount of $2,500 per violation may also be assessed for failure to submit annual monitoring reports beginning on November 1, 2010 and concluding on November 1, 2016.

38. Respondent must spend at least $97,448 to complete the SEP, as set forth in Paragraph 36 and Attachment A. In calculating such monies spent by Respondent to complete the SEP, U.S. EPA shall include lost crop income and the reduced land valuations from the establishment of a conservative easement as itemized in the cost summary included at Attachment A. Respondent shall also utilize available industry standards routinely relied upon by Respondent (e.g., CAT Handbook) to calculate the costs of services performed by employees of Respondent in implementing the SEP.

39. Respondent certifies that it is not required to perform or develop the SEP by any law, regulation, grant, order, or agreement, or as injunctive relief as of the date it signs this CAFO. Respondent further certifies that it has not received, and is not negotiating to receive, credit for the SEP in any other enforcement action.

40. Except as provided in Paragraph 41, if the SEP is not satisfactorily completed through implementation of the Scope of the Work attached hereto as Attachment A and achievement of the success standards set forth therein by the date of submittal of the Final Monitoring Report in November 1, 2016, Respondent will pay 100% of the settlement penalty

amount mitigated by the SEP, $97,448.00. The Final Monitoring Report prepared by Respondent shall contain the following information documenting the satisfactory completion of the SEP:

(a) detailed description of the SEP as completed;

(b) description of any operating problems and actions taken to correct the problems;

(c) itemized costs of goods and services used to complete the SEP documented by copies of bills of sale, invoices, purchase orders, canceled checks or other appropriate documentation that specifically identify and itemize the individual costs of the goods and services, including labor, equipment, materials, and additional job allowances;

(d) certification that Respondent has completed the SEP in compliance with this CAFO; and

(e) detailed description of the location, size, topography and vegetation of the SEP (wetland and buffer).

41. If the SEP is not completed satisfactorily, but Respondent can show that it has:

(a) made a good faith and timely effort to complete the project; and

(b) certifies, with supporting documentation consistent with that required in Paragraph 50, that at least 90 percent of the amount of money which was required to be spent was expended on the SEP, no stipulated penalty will be assessed.

42. If the SEP is satisfactorily completed, but Respondent spends less than 90 percent of the SEP amount of $97,448, a stipulated penalty of $15,566.00 (17.5% of the amount of the settlement penalty amount mitigated by the SEP) will be assessed.

43. If the SEP is satisfactorily completed, and the Respondent certifies, with supporting documentation consistent with that required in Paragraph 50, that it has spent at least 90 percent of the amount required to be spent for the SEP, no stipulated penalty will be assessed.

44. The determination of whether the SEP has been satisfactorily completed by implementation of the Scope of Work attached hereto as Attachment A and achievement of the stated performance criteria and whether the Respondent has made a good faith, timely effort to implement the SEP is reserved to the sole discretion of U.S. EPA.

45. Respondent must pay any stipulated penalties within 15 days of receiving U.S. EPA's written demand for penalties. Respondent will use the method of payment specified in Paragraphs 30-33 above, and will pay interest, handling charges, and nonpayment penalties on any overdue amounts.

46. Any public statement that Respondent makes referring to the SEP must include the following language, "Arclar Company, LLC/BBCC undertook this project under the settlement of the United States Environmental Protection Agency's enforcement action against BBCC for alleged violations of the Clean Water Act."

47. Respondent must submit all notices and reports required by this CAFO (and the requirements of the SEP at Attachment A) by first class mail to:

> Melissa Gebien (or Greg Carlson), Enforcement Officer
> U.S. Environmental Protection Agency, Region 5
> 77 West Jackson Blvd. (WW-16J)
> Chicago, Illinois 60604-3590

48. In each report that Respondent submits as provided by this CAFO (and the requirements of the SEP at Attachment A), it must certify that the report is true and complete by including the following statement signed by one of its officers:

> I certify that I am familiar with the information in this document and that, based on my inquiry of those individuals responsible for obtaining the information, the information is true and complete to the best of my knowledge. I know that there are significant

penalties for submitting false information, including the possibility of fines and imprisonment for knowing violations.

49. Respondent shall submit its first Annual Monitoring Report to U.S. EPA by not later than November 1, 2010 as provided in Attachment A hereto. This report must contain the following information:

(a) detailed description of the SEP major earth work completed to implement the SEP; and

(b) description of any operating problems and actions taken to correct the problems.

50. Following receipt of the Final Monitoring Report as described in Paragraph 40, U.S. EPA must notify Respondent in writing that:

(a) It has satisfactorily completed the SEP and the SEP report; or

(b) There are deficiencies in the SEP as completed or in the SEP report and U.S. EPA will give Respondent at least 90 days and, if deemed necessary by Respondent to correct the identified deficiencies, up to a maximum of 180 days to correct the deficiencies;

51. If U.S. EPA exercises option b. above, Respondent may object in writing to the deficiency notice within 10 days of receiving the notice. The parties will have 30 days from U.S. EPA's receipt of Respondent's objection to reach an agreement. If the parties cannot reach an agreement, U.S. EPA will give Respondent a written decision on its objection. Respondent will comply with any requirements that U.S. EPA imposes in its decisions. If Respondent does not complete the SEP as required by U.S. EPA's decision, Respondent will pay stipulated penalties to the United States under Paragraphs 40-43.

General Provisions

52. Force Majeure

(a) If any event occurs which causes or may cause delays in the completion of the SEP as required under this Agreement, Respondent shall notify U.S. EPA in writing not more than 10 days after the delay or Respondent's knowledge of the delay, whichever is earlier. The notice shall describe in detail the anticipated length of the delay, the precise cause or causes of the delay, the measures taken and to be taken by Respondent to prevent or minimize the delay, and the timetable by which those measures will be implemented. The Respondent shall adopt all reasonable measures to avoid or minimize any such delay. Failure by Respondent to comply with the notice requirements of this paragraph shall render this paragraph void and of no effect as to the particular incident involved and constitute a waiver of the Respondent's right to request an extension of its obligation under this Agreement based on such incident.

(b) If the parties agree that the delay in compliance with this Agreement has been or will be caused by circumstances beyond the control of Respondent, the time for performance hereunder may be extended for a period no longer than the delay resulting from such circumstances. In such event, the parties shall stipulate to such extension of time.

(c) In the event that the U.S. EPA does not agree that a delay in achieving compliance with the requirements of this CAFO has been or will be caused by circumstances beyond the control of the Respondent, U.S. EPA

will notify Respondent in writing of its decision and any delays in the completion of the SEP shall not be excused.

(d) The burden of proving that any delay is caused by circumstances beyond the control of the Respondent shall rest with the Respondent. Increased costs or expenses associated with the implementation of actions called for by this Agreement shall not, in any event, be a basis for changes in this Agreement or extensions of time under section (b) of this paragraph. Delay in achievement of one interim step shall not necessarily justify or excuse delay in achievement of subsequent steps.

53. Respondent certifies that upon issuance of its pending Section 404 permit application (#200600453-kam) it is complying fully with Sections 301(a) and 404 of the Act, 33 U.S.C. §§ 1311 and 1344. Furthermore, this CAFO and Respondent's pending Section 404 permit application (#200600453-kam) fully resolve all jurisdictional determinations under the Act for any ditches, streams, tributaries, wetlands or other drainage features currently present at the Mine.

54. U.S. EPA and Respondent consent to the terms of this CAFO.

55. This CAFO settles U.S. EPA's claims against Respondent for Section 404 permitting issues associated with jurisdictional waters of the United States currently present at the Mine and for civil penalties for the violations alleged in this Consent Agreement.

56. This CAFO does not affect Respondent's responsibility to comply with the Act and other applicable federal, state and local laws, and regulations.

57. Nothing in this CAFO restricts U.S. EPA's authority to seek Respondent's compliance with the Act and other applicable laws and regulations.

58. The terms of this CAFO bind Respondent, and its successors, and assigns.

59. Each person signing this CAFO certifies that he or she has the authority to sign this CAFO for the party whom he or she represents and to bind that party to its terms.

60. Each party agrees to bear its own costs and fees in this action.

61. This CAFO constitutes the entire agreement between the parties.

62. For federal income tax purposes, Respondent agrees that it will neither capitalize into inventory or basis nor deduct any costs or expenditures incurred in performing the SEP as provided in Paragraph 36 of this CAFO.

63. In accordance with Section 309(g)(5) of the Act, 33 U.S.C. § 1319(g)(5), this order will become effective 30 days after the execution of the accompanying Final Order by the Regional Administrator. No person responded to the public notice of the commencement of this action pursuant to Section 309(g)(4)(A) of the Act, 33 U.S.C. § 1319(g)(4)(A), and thus no interested persons need be notified of the issuance of the Final Order in this matter under Section 309(g)(4)(c) of the CWA, 33 U.S.C. § 1319(g)(4)(C).

In the Matter of: Black Beauty Coal Company, LLC, Arclar Company, LLC
Docket No. CWA-05-2008-0002

BLACK BEAUTY COAL COMPANY, LLC
Respondent

Dated: 2/26/2008

Charles A. Runggraf
Signature

Charles A. Runggraf
Name (print)

President
Title (print)

ARCLAR COMPANY, LLC
Respondent

Dated: 2/28/08

Mark Cavinder
Signature

Mark Cavinder
Name (print)

President
Title (print)

In the Matter of: Black Beauty Coal Company, LLC
Docket No. CWA-05-2008-0002

UNITED STATES ENVIRONMENTAL
PROTECTION AGENCY, REGION 5,
Complainant

Dated: 3/5/08

Tinka G. Hyde
Acting Director, Water Division
U.S. EPA, Region 5

In the Matter of: Black Beauty Coal Company, LLC
Docket No. CWA-05-2008-0002

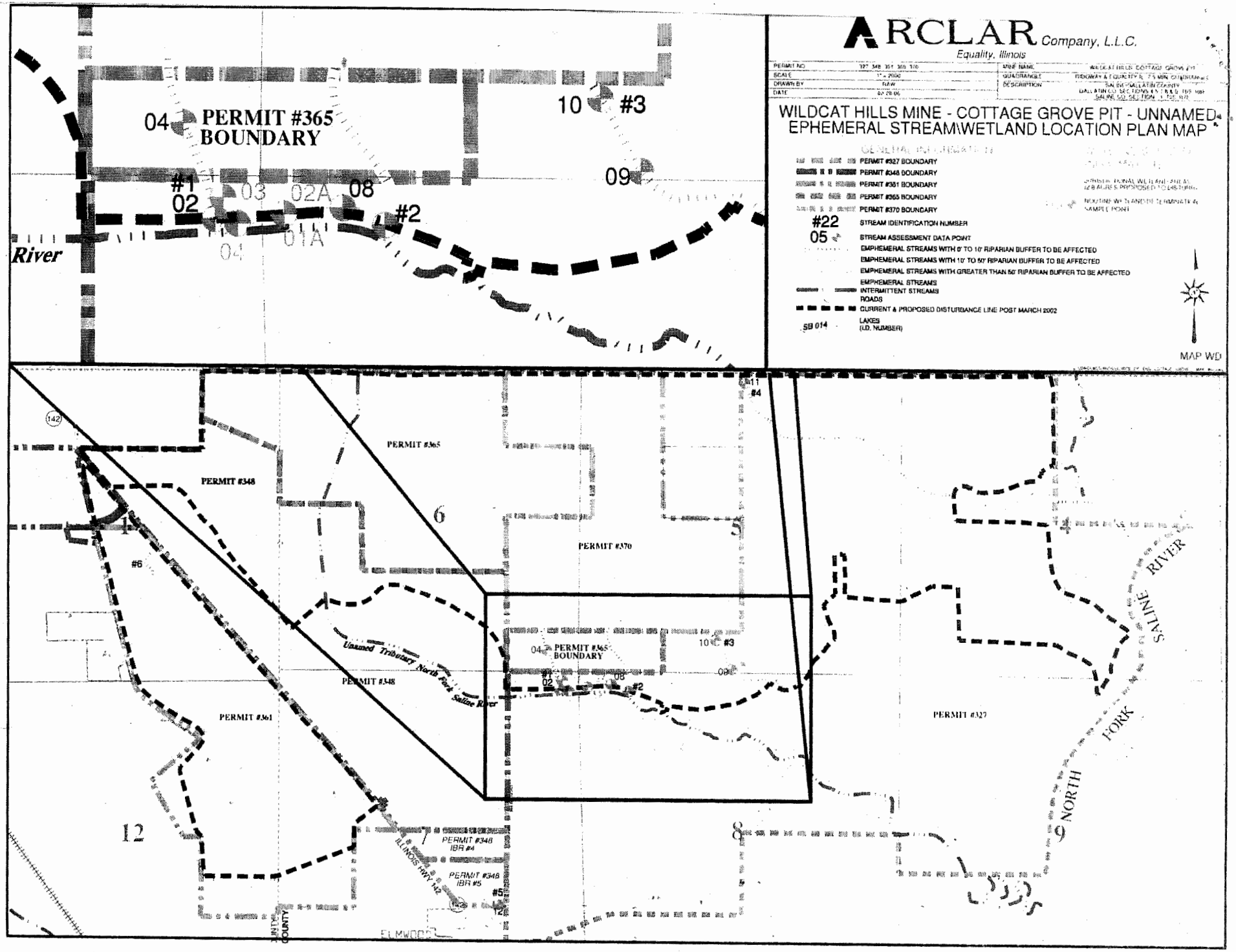
FINAL ORDER

The foregoing Consent Agreement is hereby approved and incorporated by reference into this Final Order. Black Beauty Coal Company, LLC, is hereby **ORDERED** to comply with all of the terms of the preceding Consent Agreement, effective 30 days after the date of my signature.

Dated:_____

Mary A. Gade
Regional Administrator
U.S. Environmental Protection Agency Region 5
Chicago, Illinois

EXHIBIT 1


ARCLAR Company, L.L.C.
Equality, Illinois
WILDCAT HILLS MINE - COTTAGE GROVE PIT - UNNAMED EPHEMERAL STREAM\WETLAND LOCATION PLAN MAP
PERMIT #327 BOUNDARY
PERMIT #348 BOUNDARY
PERMIT #361 BOUNDARY
PERMIT #365 BOUNDARY
PERMIT #370 BOUNDARY
#22 STREAM IDENTIFICATION NUMBER
05 STREAM ASSESSMENT DATA POINT
EMPHEMERAL STREAMS WITH 0' TO 10' RIPARIAN BUFFER TO BE AFFECTED
EMPHEMERAL STREAMS WITH 10' TO 50' RIPARIAN BUFFER TO BE AFFECTED
EMPHEMERAL STREAMS WITH GREATER THAN 50' RIPARIAN BUFFER TO BE AFFECTED
EMPHEMERAL STREAMS
INTERMITTENT STREAMS
ROADS
CURRENT & PROPOSED DISTURBANCE LINE POST MARCH 2002
SB 014 LAKES (I.D. NUMBER)
MAP WD
PERMIT #365 BOUNDARY
River
PERMIT #348
PERMIT #365
PERMIT #370
PERMIT #361
PERMIT #327
Unnamed Tributary North Fork Saline River
PERMIT #348 IBR #4
PERMIT #348 IBR #5
ILLINOIS HWY 142
ELMWOOD
SALINE RIVER
NORTH FORK

Feb 13, 2008

Supplemental Environmental Project

Black Beauty Coal Company (BBCC) proposes to create 33 additional acres of forested wetlands at its Farmersburg Mine in Vigo and Sullivan counties, Indiana. An additional 3.3 acres (10%) will be constructed to ensure a minimum final wetland acreage of 33 acres. The wetlands will be constructed during reclamation operations and will be located in one parcel that abuts Turman Creek and its intermittent tributary. A 50 foot wide forested buffer (approximately 5.5 acres in size) surrounding the wetland will also be constructed. Please see the attached SEP location map for the approximate location for the proposed wetlands.

Acreage currently planned to be reclaimed as non-prime cropland would be changed to a forested wetland containing the hard mast producing species. This project would require the preparation of a SMCRA permitting revision, intensive surveying, engineering design, increased grading of shale and soil materials, increased revegetation and maintenance costs, as well as lost annual income from crop proceeds.

The reclamation requirements for non prime cropland reclamation consist of final grading to a slope less than 12%, and subsoil and topsoil replacement to a minimum depth of 18 inches. Typically, small grains and hay crops are grown to demonstrate productivity required for SMCRA bond release. These crops are relatively inexpensive to grow when compared to the costs of wetland herbaceous species and tree seedlings. The small grains and hay also generate annual income. Non prime cropland and hayland is the least costly land use to reclaim in the Midwest. A forested wetland is the most expensive land use to reclaim. These increased costs are detailed on the next page.

Planning and design work would be completed in early 2008. Grading, seeding, deep tillage and tree planting of a minimum of 18 acres of the wetland will be completed by October 31, 2009. Grading, seeding, deep tillage and tree planting of the remaining balance of the wetland and forested upland buffer will be completed by October 31, 2010. The wetland will be monitored by BBCC for seven years and a complete wetland delineation will be completed at the end of the seven year monitoring period. A Conservation Easement (to be held by the Indiana Department of Natural Resources) will be placed on the wetland and the 50 foot wide forested buffer following completion of the final wetland delineation. Please see the attached Construction Schedule for more detail.

This project would provide a very significant benefit to the health and functionality of the applicable watershed by reducing the acreage of

ATTACHMENT A

future conventional tillage agriculture, providing an additional 36 acres of sediment filtering capacity, increasing carbon sequestration, increasing acreage of hardwood tree species, providing food and shelter to a wide variety of reptilian and mammalian species, as well as providing the habitat and refuge to numerous aquatic species.

The added value provided by a wetland land use goes beyond the obvious environmental enhancements such as groundwater recharge, nutrient and pollutant removal, flood and flow control, and aquatic and terrestrial habitat. Although wetland function is dependent on local soils, hydrology, geology, climate and biology; the average global value of ecosystem services provided by a wetland is approximately $6,000 per acre per year compared to approximately $40 per acre per year for cropland[1].

[1]Ewaschuk, E and Smyth, C. 2001. A Wetland Presentation for Agricultural Producers.

SEP Construction Schedule

2008-09

- Complete grading, soil replacement, deep tillage, seeding and tree planting on a minimum of 50% (18 acres) of the total wetland acreage by Oct. 31, 2009.

2009-10

- Complete grading, soil replacement, deep tillage, seeding and tree planting on the remaining balance of the total wetland acreage by Oct. 31, 2010.

2010-11

- Maintenance and Monitoring
- Complete and submit first Annual Monitoring report by Nov. 1, 2010. The first Annual Monitoring report shall include a full report on all SEP major earth work completed to implement the SEP and description of any operating problems and actions taken to correct the problems.

2011 – 2015

- Maintenance and Monitoring
- Annual Monitoring Reports due by Nov. 1 of each year.

2016

- Maintenance and Monitoring
- Final Monitoring Report by Nov. 1, 2016 (including final wetland delineation report)
- Execute Conservation Easement

Monitoring Reports and Success Standards

Annual monitoring reports will be based on field evaluations completed during May (spring) and September (fall) of each year. The reports will include assessments of vegetation, soils, hydrology and overall condition of the wetland. Only vegetation assessments will be completed for the forested buffer. The annual monitoring reports will be submitted to USEPA no later than November 1 of each year for the current year's monitoring. Vegetative and soil assessment points will be recorded on a site map which will be included in the Monitoring Report(s). The assessments will be completed in the following manner.

Vegetation
Annual vegetative assessments will be completed on a one evaluation for every five acres basis utilizing the following accepted SMCRA evaluation methods. Woody stems will be counted using a random point within the 5 acre block. A 20 foot radius of the evaluation point will be counted and converted to a per acre basis. Herbaceous vegetation will be assessed using a 100 foot long tape measure placed randomly within each 5 acre block. Vegetation, excluding vegetative litter, will be assessed at 1 foot intervals to determine the percentage of ground cover. Evaluation lines will be adjusted to avoid assessing areas where herbicides have been used to reduce vegetative competition or treat undesirable species. Species present will also be described. The spring and fall ground cover results will be averaged prior to submission to USEPA. Final success standards at the end of the 7 year monitoring period will be 450 live stems per acre with a 80% survival rate of the initial planted species and a minimum of 50% herbaceous ground cover.

Soils
Annual soils evaluations will be conducted within the same 20 foot radius as the woody stem counts. Soil probes will be taken to an 18" depth. Soil horizons, texture, color, redoximorphic features and other hydric soil indicators will be described. The final standard of success at the end of the 7 year monitoring period will be the presence of hydric soil indicators of a wetland per the 1987 Corps Wetland Delineation Manual.

Hydrology
Indicators of wetland hydrology will be noted and described in conjunction with the vegetation and soil assessments. Recording of the number of continuous days of inundation and/or saturation during the growing season may also be used to demonstrate wetland hydrology. The final standard of success at the end of the 7 year monitoring period will be the presence of indicators of wetland hydrology per the1987 Corps Wetland Delineation Manual.

The semi-annual field evaluations and annual monitoring reports will be used to develop maintenance plans. Completed and planned maintenance will be noted in the annual monitoring reports. The final report will include a complete wetland delineation per the 1987 Corps Wetland Delineation Manual. BBCC is committed to the successful completion of this project. A successfully constructed wetland is not only a necessary component of this SEP, but will also be necessary to meet the requirements of the Surface Mining Control and Reclamation Act (SMCRA). Should the wetland restoration and forested buffer prove to be a failure, BBCC will commit further time and resources and cooperate with USEPA to complete a successful contingency plan.

Wooded Wetland Seed Mix

Bob 1-6-07

Enter the requested Acres:	18						
			PLS				
Botanical Name	**Common Name**		**Ounces/Acre**				
				Required			
Permanent Grasses/Sedges				**Ounces**	**Lot Number**	**PLS factor**	**Total Oz Used**
Calamagrostis canadensis	Bluejoint Grass		1.00	18.00			
Carex crinita †	Fringed Sedge		2.00	36.00			
Carex lupulina †	Common Hop Sedge		4.00	72.00			
Carex lurida †	Bottlebrush Sedge		1.50	27.00			
Carex squarrosa †	Narrow-leaved Cattail Sedge		2.00	36.00			
Carex sparganioides v. cephalodea †	Rough-Clustered Sedge		1.50	27.00			
Carex typhinia †	Common Cattail Sedge		2.00	36.00			
Carex vulpinoidea	Brown Fox Sedge		4.00	72.00			
Elymus canadensis	Canada Wild Rye		8.00	144.00			
Elymus virginicus	Virginia Wild Rye		12.00	216.00			
Glyceria striata	Fowl Manna Grass		2.00	36.00			
Leersia oryzoides	Rice Cut Grass		2.00	36.00			
Scirpus atrovirens	Green Bulrush		2.00	36.00			
Spartina pectinata	Prairie Cord Grass		1.00	18.00			
		Total	45.00	810.00			
				Required			
Temporary Cover				**Ounces**	**Lot Number**	**PLS factor**	**Total Oz Used**
Avena sativa	Common Oats		537.00	9,666.00			
Lolium multiflorum	Annual Rye		112.00	2,016.00			
		Total	649.00	11,682.00			
				Required			
Forbs				**Ounces**	**Lot Number**	**PLS factor**	**Total Oz Used**
Alisma spp.	Water Plantain (Various Mix)		3.00	54.00			
Angelica atropurpurea †	Great Angelica		1.00	18.00			
Aster puniceus	Bristly Aster		0.75	13.50			
Aster umbellatus †	Flat-Top Aster		0.25	4.50			
Bidens cernua	Nodding Bur Marigold		2.50	45.00			
Campanula americana	Tall Bell Flower		0.25	4.50			
Cephalanthus occidentalis †	Button Bush		0.50	9.00			
Helenium autumnale	Sneezeweed		2.00	36.00			
Heraculeum lanatum †	Cow Parsnip		0.75	13.50			
Hibiscus moscheutos †	Swamp Rose Mallow		2.00	36.00			
Lobelia siphilitica	Great Blue Lobelia		1.50	27.00			
Mimulus ringens	Monkey Flower		1.25	22.50			
Rudbeckia laciniata	Cut-Leaf Coneflower		0.75	13.50			
Verbesina alternifolia	Wingstem		2.00	36.00			
		Total	18.00	324.00			

Mix Statistics

Native Component	PLS lbs./Acre	PLS Seeds/Acre	PLS Seeds/Sq. Ft.	% of Native Mix
Forbs	1.13	2,046,191	47.02	51.47%
Grasses	2.81	1,931,015	44.33	48.52%
Total Natives	3.94	3,979,206	91.35	100%
Cover	40.56	5,952,038	136.64	
Totals	44.50	9,931,244	227.99	

Volume Discounting is not valid if other discounting is already applied!!!

1-5 AC (699.00 per AC)	1/2 Acre	1/4 Acre
$12,582.00	$402.00	$230.00
6-14 AC Discounted (5%)	15-20 Ac Discounting (15%)	
-11952.0	-$10,694.70	
20-50 AC Discounting (20%)	50-100 AC Discounting (25%)	
-$10,065.60	-$9,436.50	

Suggested Substitutes: Carex grayii, Carex muskingumensis, Carex tuckermanii, Clematis virginicus, Elymus riparius, Napea dioica, Solidago rugosa, Silphium perfoliatum, Teucrium canadense, Clematis virginica, Agrimonia parviflora, Aster lateriflorus, Caltha palustris (wet sites) Hypericum virginicum (rich soils), Ranunculus pensylvanicus, Solidago flexicaulis, Carex intumescens, Glyceria canadensis, Milium effusum, Panicum clandestine, Carex retrosa, Lindera benzoin,

$594 /ac
+ 6/ac delivery
- 20/ac cover

BLACK BEAUTY COAL COMPANY
SUPPLEMENTAL ENVIRONMENTAL PROJECT

ACTIVITY	FORESTED WETLAND (includes costs above cost of non prime cropland only) UNITS		$ RATE	COST/ACRE	NONPRIME CROPLAND COST/ACRE	COMMENTS
Pre Design Survey & Data Download	hours	1	$35.00	$35.00	$0.00	Already completed via Typical Cross Section in SMCRA permit
Prep & Submittal of SMCRA Permit revision to change non prime cropland to forested wetland.	hours	0.2	$55.00	$11.00	$0.00	Not required, current approved land use is Non prime Cropland
Engineering Design & Mapping	hours	2	$65.00	$130.00	$0.00	Not needed
Pre Reclamation Survey & Stakeout (2 people)	hours	1	$35.00	$35.00	$0.00	Not needed
Precision grading of shale w/ D10 Dozer (1.5' depth = 2420 cu yards/acre)	cu yards	2420	$0.70	$1,694.00	$0.00	Rough Grading is sufficent for non prime cropland.
Survey of graded shale to monitor and verify required elevations	hours	0.2	$35.00	$7.00	$0.00	Not Required
Soil Replacement (Part of normal reclamation cost)				$0.00	$10,387.72	4' depth @ $1.61/cubic yard
Soil surface survey and stakeout (2 people)	hours	1	$35.00	$35.00	$0.00	Not Required
Precision grading of replaced soil w/ D7 Dozer (1' depth = 1613 cu yards/acre)	cu yards	1613	$0.80	$1,290.40	$0.00	Not Required
Survey of graded soil to monitor and verify required elevations	hours	0.2	$35.00	$7.00	$0.00	Experienced Operator can accomplish w/out survey assistance
Soil Testing, Fertilizer & Ag Lime applications (Part of normal reclamation costs)				$0.00	$125.00	Average Cost, actual is based on soil test results
Tillage, Planting, harrowing, etc (Part of normal reclamation costs)				$0.00	$99.00	
Deep tillage to 24" to alleviate compaction from Precision grading	acres	1	$80.00	$80.00	$0.00	Not required for non prime cropland, where less grading has occurred.
Discing to smooth soil surface after deep tillage	acres	1	$12.00	$12.00	$0.00	Not required if Deep Tillage is not required
Herbaceous revegetation (includes difference in wet species seed vs. wheat seed)				$44.00	$0.00	Wet species cost = $60/ac, Wheat seed cost = $16/ac
Mulching to promote seed germination and soil protection (includes 3 round bales/acre)	acres	1	$210.00	$210.00	$0.00	Wheat crop would be drilled on non prime cropland.
Tree seedlings, pick up, cold storage, planting	trees	600	$0.70	$420.00	$0.00	Crops would be planted on non prime cropland
Maintenance, herbicide treatment, fertilization for 7 year period				$345.00	$0.00	Considered in net crop income calculation.
Monitoring & Reporting for 5 year period (8 hours/year)	hours	40	$55.00	$2,200.00	$0.00	Only reporting required is yield results in bond release application.
Stem Count and Ground Cover Survey required for Forest Land use in SMCRA (0.5 hr/ac)	hours	0.5	$55.00	$27.50	$0.00	Only reporting required is yield results in bond release application.
Annual loss of net crop income ($50 per acre for 5 years)				$250.00	$0.00	Income loss for 5 years is estimated; however, actual crop income loss is permanent.
TOTAL COST PER ACRE				$6,832.90	$10,611.72	
TOTAL COST FOR 36.3 ACRES				$248,034.00		
Forested Buffer (5.5 ac @ $3,496.50/ac)				$19,230.00		
Conservation Easement Reduction in Land Value (41.8 ac @ $600/ac)				$25,080.00		
TOTAL ESTIMATED SEP COST				$292,344.00		

NOTES:
All surveying completed on 50' X 50' grid or closer if needed.
Surveying, Engineering, Monitoring and Reporting costs are based on internal costs. External costs would be considerably higher.
Actual line item costs may vary (+ or -); however, final total cost will be within 90% of estimated total.

Deciduous Woodland Seed Mix

Bob 1/5/07

Enter the requested Acers: 5.5

Botanical Name	Common Name	PLS Ounces/Acre	Required Ounces	Lot Number	PLS Factor	Total Oz used
Permanent Grasses						
Bromus pubescens	Woodland Brome	4.00	22.00			
Carex apaganoides var. cephaloidea †	Rough Clustered Sedge	6.00	33.00			
Diarrhena americana	Beak Grass	0.50	2.75			
Elymus villosus	Silky Wild Rye	6.00	33.00			
Elymus hystrix	Bottlebrush Grass	16.00	88.00			
	Totals	32.50	178.75			
Temporary Cover			Required Ounces	Lot Number	PLS Factor	Total Oz used
Avena sativa	Seed Oats	360.00	1,980.00			
Lolium Multiflorum	Annual Rye	120.00	660.00			
	Totals	480.00	2,640.00			
Forbs			Required Ounces	Lot Number	PLS Factor	Total Oz used
Actea pachypoda	Dolls Eyes-dogbane	1.00	5.50			
Anemone cylindrica	Thimbleweed	1.00	5.50			
Aquilegia canadensis	Wild Columbine	1.25	6.88			
Aster sagittifolius	Arrow-leaved Aster	2.50	13.75			
Aureolaris flava	Smooth False Foxglove	1.00	5.50			
Campanula americana	Tall Bellflower	2.00	11.00			
Caulophylum thalictroides	Blue Cohosh	2.00	11.00			
Osmorhiza claytonii †	Hairy Sweet Cicely	4.00	22.00			
Polygonatum canlculatum †	Smooth Solomons Seal	2.00	11.00			
Scrophularia marilandica	Late Figwort	2.00	11.00			
Smilacina racemosa †	Feathery False Solomons Seal	1.75	9.63			
Trillium grandiflorum	Grand-Flowered Trillium	0.25	1.38			
	Totals	20.75	114.13			

Mix Statistics

Native Component	PLS lbs./Acre	PLS Seeds/Acre	PLS Sds/sq.Ft.	% of Native Mix
Forbs	1.29	2,229,515	51.18	90.00%
Grasses	2.03	245,412	5.63	10.00%
Total Natives	3.32	2,474,927	56.81	100.00%
Cover	30.00	4,627,560	106.23	
Totals	30.00	4,627,560	163.04	

Volume discounting is not valid if other discounting has been applied!

1-5 Acres ($1065) per acre $5,857.50	1/2 Acre $532.50	1/4 Acre $266.25
6-14 AC Discounting (5%) -$5,564.63	15-20 AC Discounting (15%) -$4,978.88	
21-50 AC Discounting (20%) -$4,686.00	51-100 AC Discounting (25%) -$4,393.13	

$1,011.75/ac + $/ac delivery

Suggested Substitutes

Allium triccum, Cryptotaenia canadensis, Eupatorium purpurescens, Eupatorium rugosum, Geranium maculatum, Hydrophylum virginicum, Osmorhiza claytonii, Podophylum peltatum, Sanguina canadensis, Sanicula gregorri, Solidago caesia, Stylophorum diphylum, Thalictrum diocium, Desmodium glutinosum, Aster shortii, Penstemon calycosus, Taenidia interrima, Carex sprengelli, Carex swanii,

VEGETATIVE SPECIES AND PLANTING PLAN

Forested Buffer Area Seeding & Planting Stock

Scientific Name	Common Name	Approx. Seeding or Planting Rate	Method of Application
Lolium multiflorum	Annual Rye	40 lb/ac	Drilled or Broadcast
Triticum aestivum	Wheat	40 lb/ac	Drilled or Broadcast
Avena sativa	Oats	40 lb/ac	Drilled or Broadcast
Liriodendron tulipifera	Yellow Poplar	600 seedlings/ac	Mechanical or Hand
Diospyros virginiana	Persimmon	600 seedlings/ac	Mechanical or Hand
Quercus spp.	Red Oak species	600 seedlings/ac	Mechanical or Hand
Quercus spp.	White Oak species	600 seedlings/ac	Mechanical or Hand
Carya spp.	Hickory	600 seedlings/ac	Mechanical or Hand
Juglans nigra	Black Walnut	600 seedlings/ac	Mechanical or Hand

Note:

1. Planting mix for herbaceous species will consist of a mixture of a minimum of 4 perennial and 1 annual species to assure diversity
2. Woody plantings will consist of a minimum of 5 species with no single tree species comprising more than 25% of the total planting.
3. Spacing of woody plantings will be ~8' X 9'.
4. See the JF New Deciduous Woodland Seed Mix for perennial herbaceous species to be used.

Wetland Seeding & Planting Stock

Scientific Name	Common Name	Approx. Seeding or Planting Rate	Method of Application
Lolium multiflorum	Annual Rye	40 lb/ac	Drilled or Broadcast
Triticum aestivum	Wheat	40 lb/ac	Drilled or Broadcast
Avena sativa	Oats	40 lb/ac	Drilled or Broadcast
Quercus lyrata	Overcup Oak	600 seedlings/ac	Mechanical or Hand
Quercus bicolor.	Swamp White Oak	600 seedlings/ac	Mechanical or Hand
Quercus macrocarpa	Bur Oak	600 seedlings/ac	Mechanical or Hand
Quercus palustris	Pin Oak	600 seedlings/ac	Mechanical or Hand
Quercus michauxii	Swamp Chestnut Oak	600 seedlings/ac	Mechanical or Hand
Taxodium distichum	Bald Cypress	600 seedlings/ac	Mechanical or Hand
Platanus occidentalis	Sycamore	600 seedlings/ac	Mechanical or Hand
Carya laciniosa	Shellbark Hickory	600 seedlings/ac	Mechanical or Hand
Carya illinoinensis	Pecan[FacW]	600 seedlings/ac	Mechanical or Hand

Note:

1. Planting mix for herbaceous species will consist of a mixture of a minimum of 4 perennial and 1 annual species to assure diversity
2. Woody plantings will consist of a minimum of 5 species with no single tree species comprising more than 25% of the total planting.
3. Spacing of woody plantings will be ~8' X 9'.
4. Undesirable invasive species will be treated and controlled with appropriate herbicides according to manufacturer's recommendations. Desirable volunteer species will be encouraged.
5. See the JF New Wooded Wetland Seed Mix for herbaceous species to be used.

Design Summary

Flooding Frequency and Magnitude:

Flooding frequency and magnitude for the undisturbed East Branch of Turman Creek adjacent to the proposed SEP mitigation site was considered in design of the constructed wetland. Current plans are to mine through the east branch; however, stream dimensions will be restored to the approximate pre-mining conditions. Enhancements to the stream channel will be made per the applicable Section 404 authorization. The SEP flooding frequency and magnitude design study is based on current channel dimensions and the restored channel will reflect the same approximate dimensions. Similar to premining conditions, reconstruction will not allow over bank flooding along the west bank of the east branch of Turman Creek. TR-20 Hydrographs were developed to predict watershed runoff for the one year (1 yr/24 hr) and two year (2 yr/24 hr) twenty four hour storm events. The rainfall events are 2.71 inches (1 yr/24 hr) and 3.11 inches (2 yr/24 hr). The watershed area upstream of the project area totaled 539.9 acres. An average runoff curve of 70 was applied with a time of concentration of 1.5 hours. The hydrograph model calculated peak discharge of 97.5 cfs and 145.5 cfs (see TR-20 Hydrograph Model Reports pages 1 and 2). Channel conveyance of the hydrograph modeled discharge was calculated using Mannings equation to determine the channel depth at design flow. Existing channel cross-sections were surveyed at three locations immediately adjacent to the proposed mitigation site (Section 5, 8, and 11). The predicted flow elevation (flood magnitude) for each cross-section was determined using Mannings equation. Input parameters of wetted perimeter and wetted cross-sectional area, channel slope, Mannings coefficient, and flow depth were used in the calculation to obtain a conveyance discharge capacity approximating the design runoff events. The predicted water surface elevation at this conveyance capacity was then used to interpolate the elevation at which overbank flooding could be predicted for the given recurrence interval of 1.8 years. The 1.8 year recurrence interval was derived from the USGS Scientific Investigations Report 2005-5153 – Bankfull Characteristics of Ohio Streams and Their Relation to Peak Streamflows.

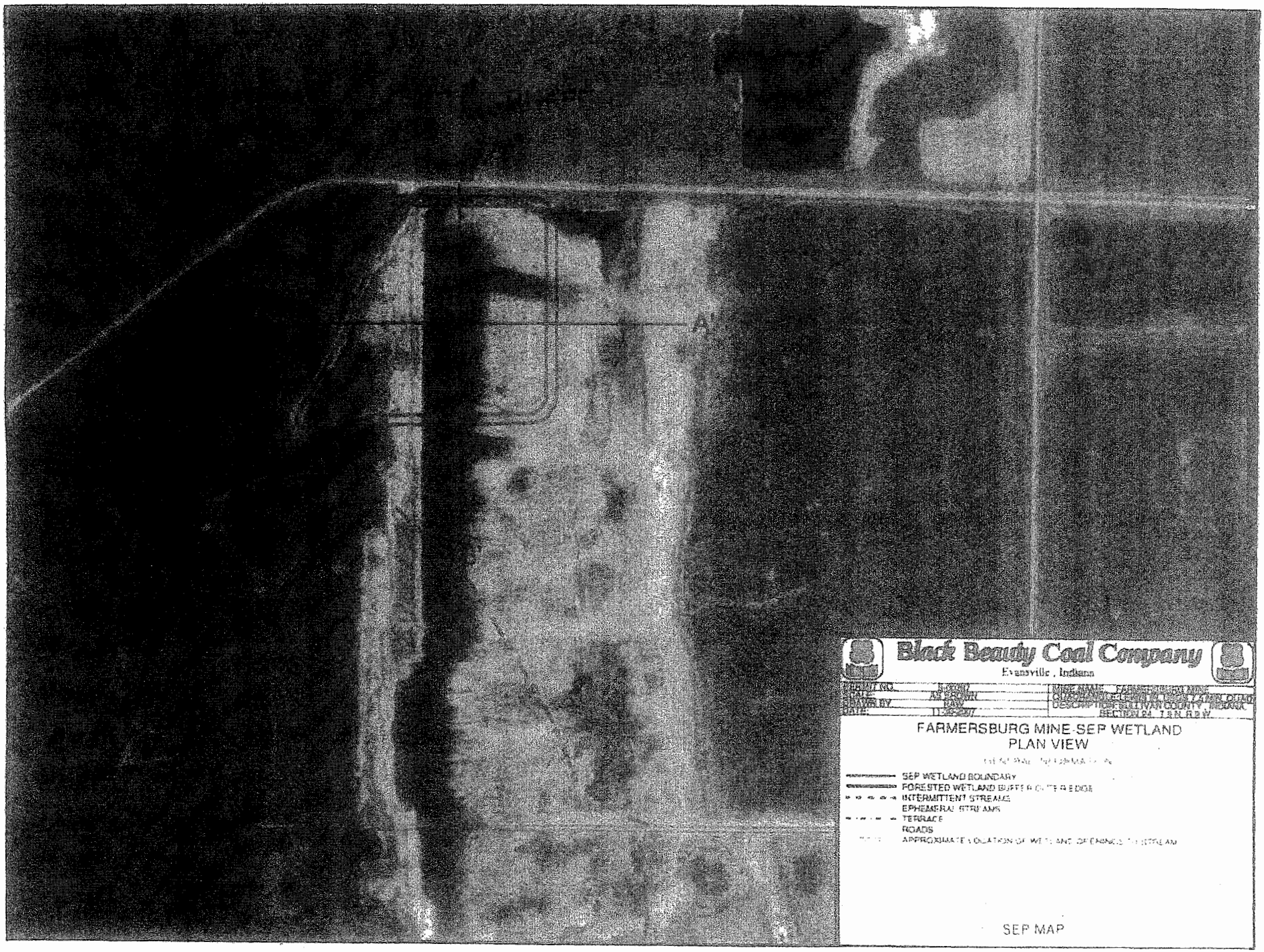
SEP Mitigation Site:

The calculated bankfull discharge was utilized to determine the elevation of the incipient point of flooding that would occur along the mitigated Turman Creek tributary for the proposed SEP mitigation site. The mitigation site will be constructed at the same elevation or below to ensure that inundation or saturation will occur to create adequate hydrology for the creation of hydric soils and success of hydrophytic

vegetation. A near flat topography will be constructed for the wetland. Criteria for wetland determination as found in the 1987 Corps of Engineers Wetland Delineation Manual will be used to validate the presence of hydrophytic vegetation and hydric soils. The site will be ultimately self-sustaining after the establishment of the permanent vegetation.

Proposed Direct Watershed Runoff:

In addition to the contribution of upstream overbank flooding from Turman Creek and its' tributaries an additional 240 acres of direct watershed will flow through the proposed SEP mitigation site. Hydrograph runoff models for the direct watershed were also developed for the (1 yr/24 hr) and (2 yr/24 hr) events. The TR-20 hydrographs predict a runoff volume for the direct watershed of 11.2 and 15.5 acre-feet, respectively. The direct watershed can be predicted to result in a contribution 0.3-0.4 feet of runoff depth across the entire 36 acre SEP mitigation site.


Black Beauty Coal Company
Evansville, Indiana
FARMERSBURG MINE-SEP WETLAND
PLAN VIEW
SEP WETLAND BOUNDARY
FORESTED WETLAND BUFFER OUTER EDGE
INTERMITTENT STREAMS
EPHEMERAL STREAMS
TERRACE
ROADS
SEP MAP

CERTIFICATION OF PLAN

I, Ann M. Nelson, P.E., certify [2] the plan entitled "Farmersburg Mine - SEP Wetland" was developed in accordance with prudent engineering principles and practices, and applicable design criteria.

ANN M. NELSON
REGISTERED
No. 10606515
STATE OF
INDIANA
PROFESSIONAL ENGINEER

SIGNED: Ann M. Nelson
Ann M. Nelson, P.E.

DATE: 12-3-07
Peabody Energy

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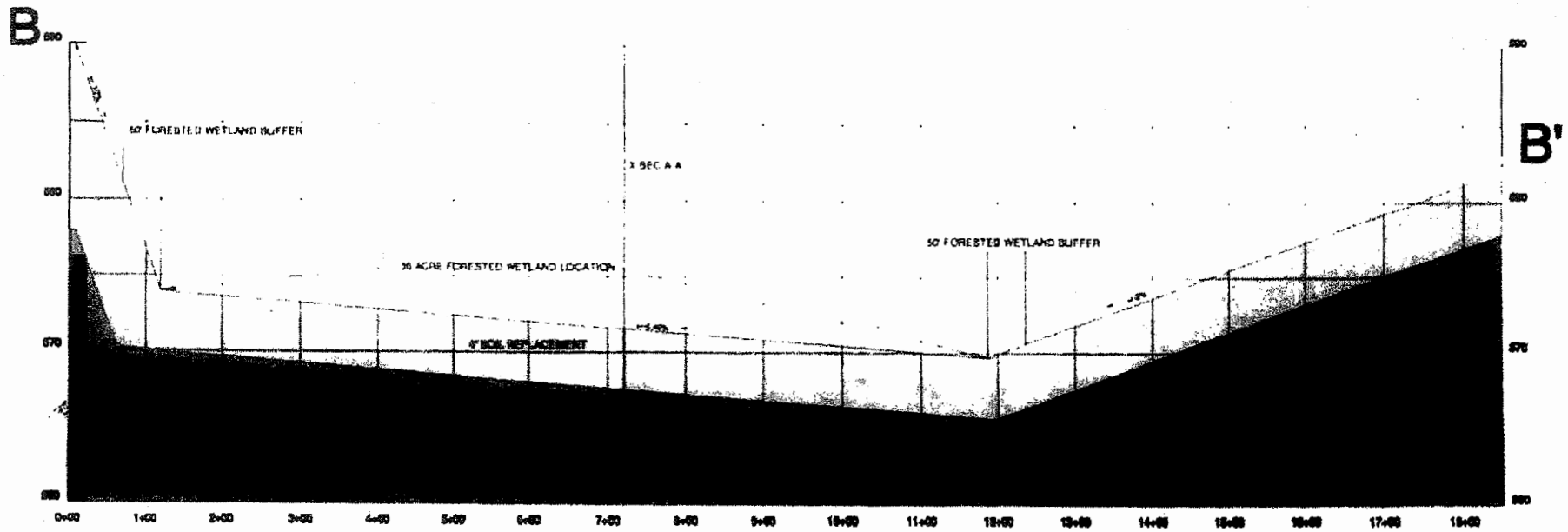
[2] The term "certify," as used herein, is defined as follows: "An Engineer's certification of conditions is a declaration of professional judgment. It does not constitute a warranty or guarantee, either expressed or implied, nor does it relieve any other party of their responsibility to abide by contract documents, applicable codes, standards, regulations, and ordinances."



Black Beauty Coal Company

Evansville, Indiana

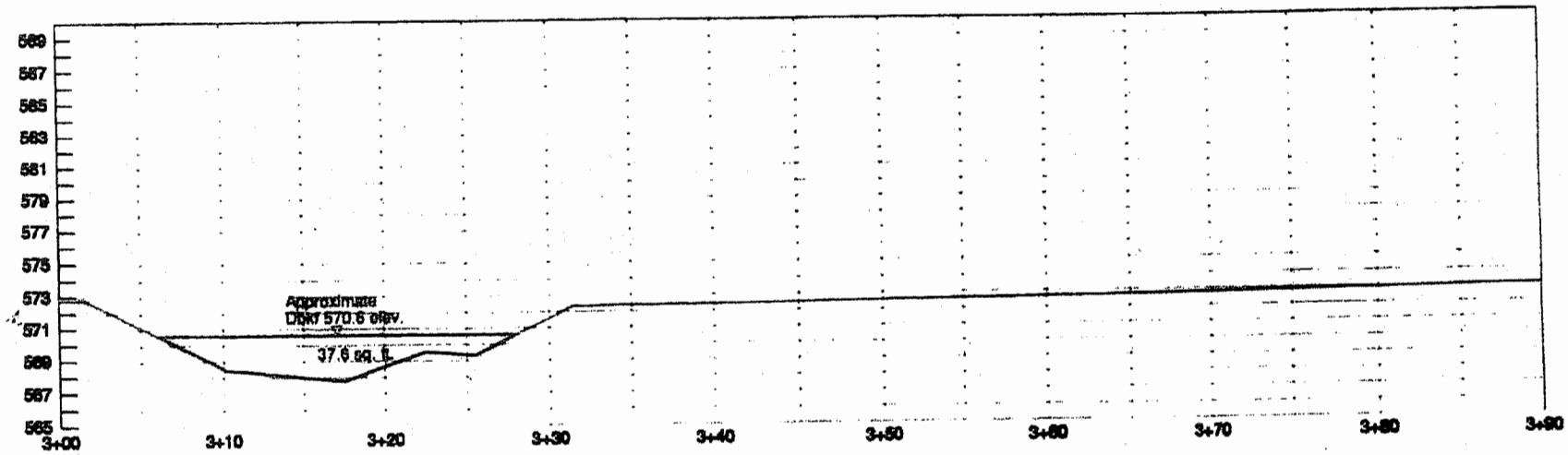
FARMERSBURG MINE-SEP WETLAND
CROSS SECTION B-B' DOWN VALLEY

GENERAL INFORMATION

WETLAND SOIL PLACEMENT
WETLAND OVERBURDEN PLACEMENT
A——A' CROSS-SECTION

SEP MAP

Turman Creek Section 8 1.8yr/24hr Event Conveyance Section-Pre-Mining



*Depth of Bankful (DBkf) determined by utilizing the 1 and 2 year flood frequency models to calculate the related streamflow elevations. These elevations were used to extrapolate the elevation of a 1.8 year flood frequency event. The approximated 1.8 year interval was derived from the USGS Scientific Investigations report 2005-5153-Bankful Characteristics of Ohio Streams and Their Relation to Peak Streamflows. The mean Dbkf was estimated to be at an approximate 1.8 year interval.

Black Beauty Coal Company

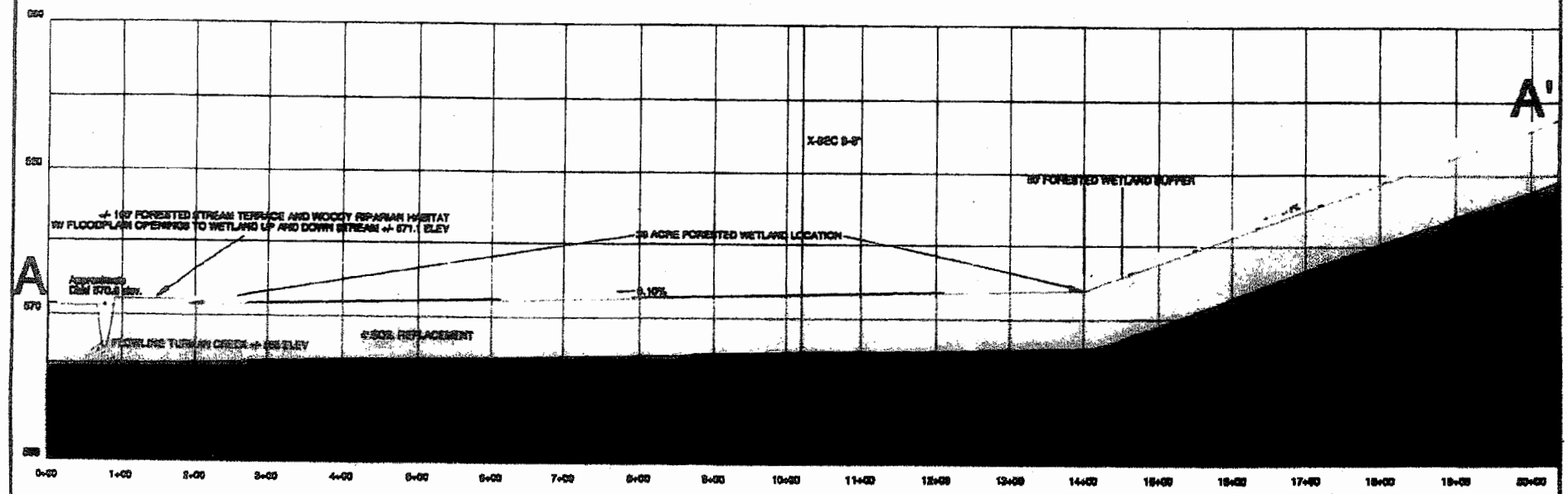
Evansville, Indiana

FARMERSBURG MINE-SEP WETLAND
ASSESSED STREAM CROSS SECTION

GENERAL INFORMATION

DEPTH AT BANK FULL (DBkf)
GROUND LINE

SEP MAP



Black Beauty Coal Company

Evansville, Indiana

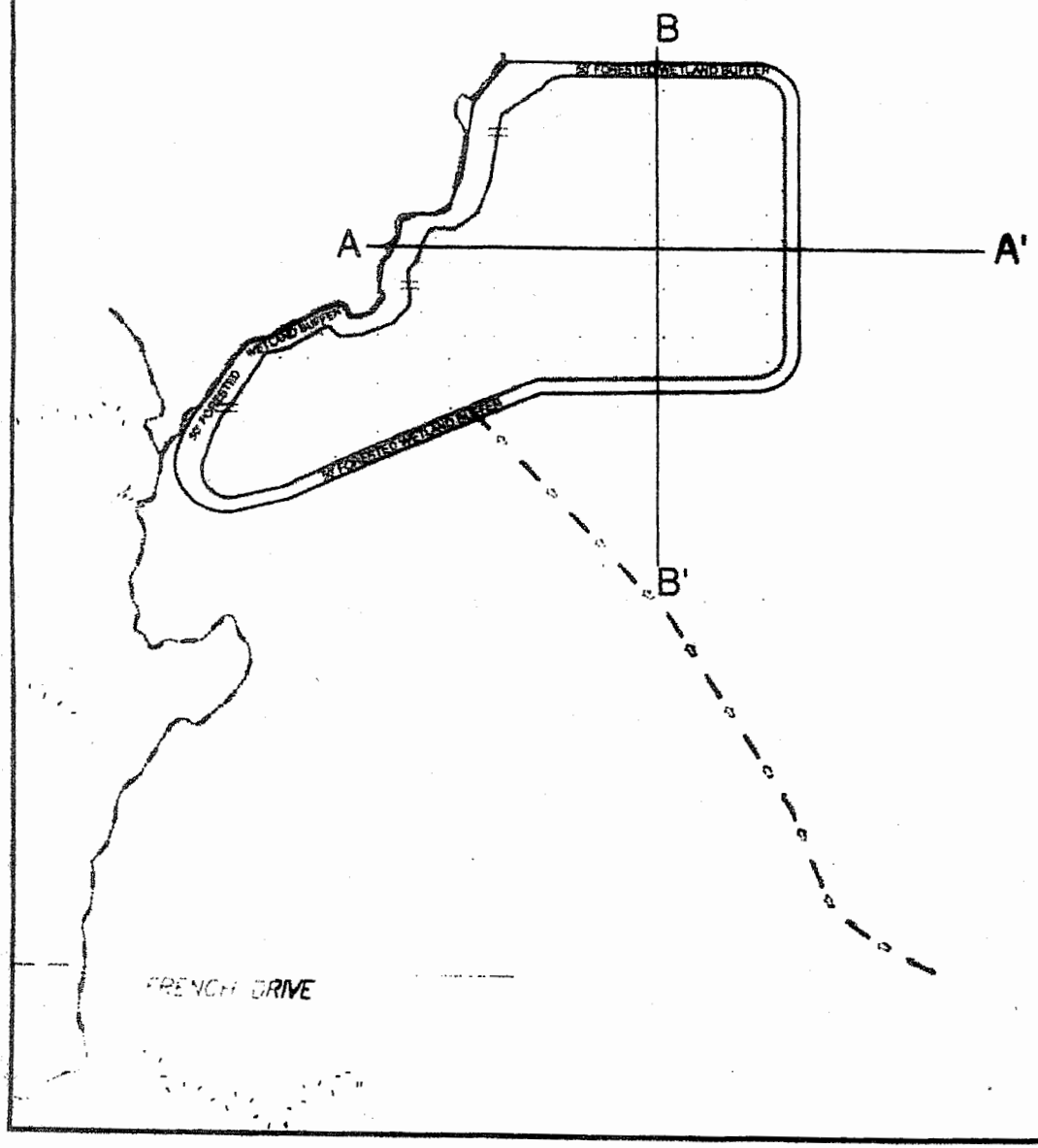
FARMERSBURG MINE-SEP WETLAND
CROSS SECTION A-A' THROUGH STREAM

GENERAL INFORMATION

WETLAND SOIL PLACEMENT
WETLAND OVERBURDEN PLACEMENT
A——A' CROSS-SECTION

SEP MAP

APPROXIMATE LOCATION OF
SEP WETLAND
TURMAN CREEK WATERSHED
36 ACRES IN SIZE W/50' FORESTED BUFFER



BRIGGS ST.

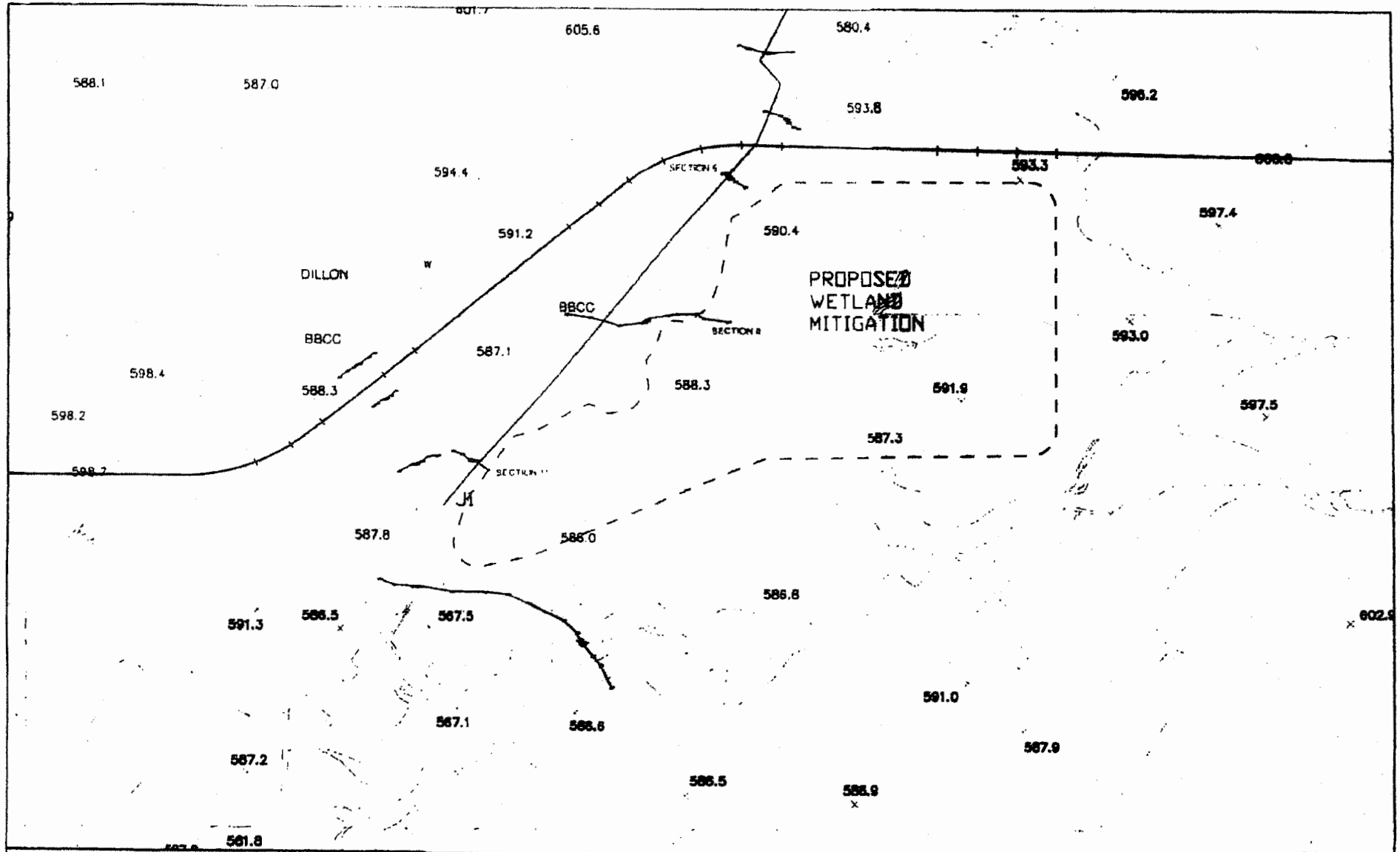
Black Beauty Coal Company
Evansville, Indiana

FARMERSBURG MINE-SEP WETLAND
PLAN VIEW

GENERAL INFORMATION

- SEP WETLAND BOUNDARY
- FORESTED WETLAND BUFFER OUTER EDGE
- INTERMITTENT STREAMS
- EPHEMERAL STREAMS
- TERRACE
- ROADS
- APPROXIMATE LOCATION OF WETLAND OPENINGS TO STREAM

SEP MAP



Black Beauty Coal Company
EVANSVILLE, INDIANA
Cross-Section Locations
Turman Creek East Branch
Farmersburg Mine, IDNR #S-287

DATE: 11/30/2007		REVISION NO.:	DATE:
ENGINEER:	TECH: ABN		
SCALE: 1 in = 500 ft		NOTES:	
SHEET 1 OF 1			

TR20 SCS - VERSION 2.04 Hyrdrograph Model
Turman Creek East Branch Watershed
Runoff Storm Event 1yr / 24hr, 2.71 inches

EXECUTIVE CONTROL INCREM MAIN TIME INCREMENT = .100 HOURS
EXECUTIVE CONTROL COMPUT FROM XSECTION 1 TO XSECTION 1
STARTING TIME = .00 RAIN DEPTH = 2.71 RAIN DURATION = 1.00
ANT. RUNOFF COND. = 2 MAIN TIME INCREMENT = .100 HOURS
ALTERNATE NO. = 1 STORM NO. = 1 RAIN TABLE NO. = 2
OPERATION RUNOFF XSECTION 1
OUTPUT HYDROGRAPH = 6 RUNOFF AREA = 539.9 acres, .84 SQ MI
INPUT RUNOFF CURVE = 70. TIME OF CONCENTRATION = 1.50 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0947 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET) (RUNOFF)
12.95	97.5	

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 1
MAIN TIME INCREMENT = .100 hr, DRAINAGE AREA = .84 SQ.MI.

HRS								
11.80	CFS	.47	2.32	6.63	13.61	23.44	36.38	51.47	66.33
12.60	CFS	78.86	88.17	94.25	97.22	97.28	95.14	91.03	84.99
13.40	CFS	78.07	71.81	66.42	61.62	57.37	53.56	50.03	46.81
14.20	CFS	43.93	41.32	38.95	36.79	34.84	33.07	31.49	30.09
15.00	CFS	28.83	27.71	26.70	25.78	24.95	24.20	23.50	22.85
15.80	CFS	22.25	21.69	21.14	20.61	20.09	19.57	19.06	18.57
16.60	CFS	18.11	17.71	17.34	17.00	16.68	16.40	16.13	15.88
17.40	CFS	15.66	15.44	15.24	15.05	14.87	14.69	14.52	14.35
18.20	CFS	14.19	14.02	13.86	13.71	13.55	13.39	13.24	13.08
19.00	CFS	12.93	12.77	12.62	12.46	12.30	12.15	11.99	11.83
19.80	CFS	11.67	11.51	11.35	11.19	11.03	10.87	10.71	10.56
20.60	CFS	10.41	10.27	10.14	10.03	9.92	9.82	9.74	9.66
21.40	CFS	9.59	9.53	9.47	9.42	9.37	9.33	9.29	9.25
22.20	CFS	9.21	9.18	9.14	9.11	9.08	9.04	9.01	8.98
23.00	CFS	8.95	8.92	8.89	8.87	8.84	8.81	8.78	8.75
23.80	CFS	8.72	8.69	8.66	8.61	8.51	8.34	8.09	7.72
24.60	CFS	7.23	6.64	5.99	5.31	4.64	4.00	3.41	2.87
25.40	CFS	2.40	2.00	1.68	1.41	1.19	1.00	.84	.71
26.20	CFS	.59	.50						

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
.56 WATERSHED INCHES; 304 CFS-HRS; 25.2 ACRE-FEET.

DURATION(HRS)	2	4	6	8	10	12	14	14
FLOW(CFS)	39	20	14	11	9	9	1	0

TR20 ---------- SCS - VERSION 2.04TEST
11/28/**
10:51:25 SUMMARY, JOB NO. 1 PAGE 2

SUMMARY TABLE 1

SELECTED RESULTS OF STANDARD AND EXECUTIVE CONTROL IN ORDER PERFORMED.
A CHARACTER FOLLOWING THE PEAK DISCHARGE TIME AND RATE (CFS) INDICATES:
F-FLAT TOP HYDROGRAPH T-TRUNCATED HYDROGRAPH R-RISING TRUNCATED HYDROGRAPH

XSECTION/ STRUCTURE ID	STANDARD CONTROL OPERATION	DRAINAGE AREA (SQ MI)	RUNOFF AMOUNT (IN)	PEAK DISCHARGE ELEVATION (FT)	TIME (HR)	RATE (CFS)	RATE (CSM)
RAINFALL OF 2.71 inches AND 24.00 hr DURATION, BEGINS AT .0 hrs.							
RAINTABLE NUMBER 2, ARC 2							
MAIN TIME INCREMENT .100 HOURS							
ALTERNATE 1 STORM 1							
XSECTION 1	RUNOFF	.84	.56	---	12.95	98	116.7

Black Beauty Coal Company EVANSVILLE, INDIANA TR-20 Hydrograph Model Report Turman Creek East Branch Farmersburg Mine, IDNR #S-287	DATE: 11/30/2007	REVISION NO.:	DATE:
	ENGINEER: TECH: ABN		
		NOTES:	
	SHEET 1 OF 4		

TR20 SCS - VERSION 2.04 Hydrograph Model
Turman Creek East Branch Watershed
Runoff Storm Event 2yr/24hr, 3.11 Inches

EXECUTIVE CONTROL INCREM MAIN TIME INCREMENT = .100 HOURS
EXECUTIVE CONTROL COMPUT FROM XSECTION 1 TO XSECTION 1
STARTING TIME = .00 RAIN DEPTH = 3.11 RAIN DURATION = 1.00
ANT. RUNOFF COND. = 2 MAIN TIME INCREMENT = .100 HOURS
ALTERNATE NO. = 1 STORM NO. = 1 RAIN TABLE NO. = 2
OPERATION RUNOFF XSECTION 1
OUTPUT HYDROGRAPH = 6 Runoff AREA = 539.9 acres, .84 SQ MI
INPUT RUNOFF CURVE = 70. TIME OF CONCENTRATION = 1.50 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0947 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET) (RUNOFF)
12.92	145.4	

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 1
MAIN TIME INCREMENT = .100 hr, DRAINAGE AREA = .84 SQ.MI.

HRS								
11.70 CFS	.34	1.52	5.08	12.39	23.83	39.55	59.56	82.12
12.50 CFS	104	122	134	142	145	144	140	132
13.30 CFS	123	112	102	94	87	80	75	69
14.10 CFS	64.51	60.27	56.46	53.01	49.89	47.08	44.54	42.29
14.90 CFS	40.29	38.51	36.93	35.51	34.22	33.05	31.99	31.02
15.70 CFS	30.12	29.28	28.51	27.75	27.02	26.30	25.59	24.90
16.50 CFS	24.23	23.62	23.07	22.58	22.13	21.71	21.32	20.97
17.30 CFS	20.64	20.34	20.05	19.78	19.53	19.28	19.04	18.81
18.10 CFS	18.59	18.37	18.15	17.94	17.73	17.52	17.32	17.11
18.90 CFS	16.91	16.70	16.49	16.29	16.08	15.87	15.67	15.46
19.70 CFS	15.25	15.04	14.83	14.62	14.41	14.20	13.99	13.79
20.50 CFS	13.59	13.40	13.22	13.05	12.89	12.75	12.63	12.51
21.30 CFS	12.41	12.32	12.24	12.16	12.10	12.03	11.97	11.92
22.10 CFS	11.87	11.82	11.77	11.72	11.68	11.64	11.59	11.55
22.90 CFS	11.51	11.47	11.43	11.39	11.35	11.31	11.27	11.24
23.70 CFS	11.20	11.16	11.12	11.08	11.01	10.88	10.67	10.34
24.50 CFS	9.87	9.24	8.48	7.65	6.79	5.93	5.11	4.35
25.30 CFS	3.66	3.05	2.55	2.14	1.80	1.52	1.28	1.08
26.10 CFS	.90	.76	.64	.53	.45			

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
.78 WATERSHED INCHES; 423 CFS-HRS; 34.9 ACRE-FEET.

DURATION(HRS)	2	4	6	8	10	12	14	15
FLOW(CFS)	56	26	19	14	12	11	2	0

TR20 ---------- SCS - VERSION 2.04TEST
11/28/**
10:45:44 SUMMARY, JOB NO. 1 PAGE 2
SUMMARY TABLE 1

SELECTED RESULTS OF STANDARD AND EXECUTIVE CONTROL IN ORDER PERFORMED.
A CHARACTER FOLLOWING THE PEAK DISCHARGE TIME AND RATE (CFS) INDICATES:
F-FLAT TOP HYDROGRAPH T-TRUNCATED HYDROGRAPH R-RISING TRUNCATED HYDROGRAPH

XSECTION/ STRUCTURE ID	STANDARD CONTROL OPERATION	DRAINAGE AREA (SQ MI)	RUNOFF AMOUNT (IN)	PEAK DISCHARGE ELEVATION (FT)	TIME (HR)	RATE (CFS)	RATE (CSM)

RAINFALL OF 3.11 Inches AND 24.00 hr DURATION, BEGINS AT .0 hrs.
RAINTABLE NUMBER 2, ARC 2
MAIN TIME INCREMENT .100 HOURS
ALTERNATE 1 STORM 1

XSECTION 1	RUNOFF	.84	.78	---	12.92	145	172.6

Black Beauty Coal Company EVANSVILLE, INDIANA TR-20 Hydrograph Model Report Turman Creek East Branch Farmersburg Mine, IDNR #S-287	DATE: 11/30/2007 ENGINEER: TECH: ABN SHEET 2 OF 4	REVISION NO.: DATE: NOTES:

TR20 SCS - Version 2.04 Hydrograph Model
SEP Mitigation Wetland Direct Post-Mine Reclaimed Watershed
Runoff Storm Event 1yr/24hr, 2.71 Inches

EXECUTIVE CONTROL INCREM MAIN TIME INCREMENT = .100 HOURS
EXECUTIVE CONTROL COMPUT FROM XSECTION 1 TO XSECTION 1
STARTING TIME = .00 RAIN DEPTH = 2.71 RAIN DURATION = 1.00
ANT. RUNOFF COND. = 2 MAIN TIME INCREMENT = .100 HOURS
ALTERNATE NO. = 1 STORM NO. = 1 RAIN TABLE NO. = 2
OPERATION RUNOFF XSECTION 1
OUTPUT HYDROGRAPH = 6 Runoff AREA = ~240 acres, .38 SQ MI
INPUT RUNOFF CURVE = 70. TIME OF CONCENTRATION = 1.00 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0923 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.60	57.0	(RUNOFF)

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 1
HRS MAIN TIME INCREMENT = .100 hr, DRAINAGE AREA = .38 SQ.MI.

HRS								
11.70 CFS	.07	.65	3.01	8.39	17.26	28.93	40.86	50.12
12.50 CFS	55.45	56.98	55.34	51.18	45.57	40.25	35.83	32.15
13.30 CFS	28.98	26.24	23.93	21.96	20.26	18.79	17.52	16.42
14.10 CFS	15.46	14.59	13.82	13.14	12.54	12.01	11.56	11.15
14.90 CFS	10.77	10.44	10.15	9.90	9.68	9.47	9.27	9.08
15.70 CFS	8.89	8.71	8.52	8.34	8.15	7.97	7.80	7.63
16.50 CFS	7.47	7.32	7.19	7.08	6.97	6.88	6.79	6.71
17.30 CFS	6.63	6.56	6.49	6.42	6.35	6.28	6.21	6.15
18.10 CFS	6.08	6.01	5.95	5.88	5.81	5.75	5.68	5.61
18.90 CFS	5.54	5.48	5.41	5.34	5.27	5.20	5.13	5.05
19.70 CFS	4.98	4.91	4.84	4.77	4.69	4.62	4.55	4.49
20.50 CFS	4.43	4.37	4.32	4.28	4.25	4.22	4.20	4.17
21.30 CFS	4.16	4.14	4.12	4.11	4.09	4.08	4.06	4.05
22.10 CFS	4.04	4.02	4.01	4.00	3.99	3.98	3.96	3.95
22.90 CFS	3.94	3.93	3.91	3.90	3.89	3.88	3.86	3.85
23.70 CFS	3.84	3.82	3.81	3.79	3.75	3.64	3.45	3.15
24.50 CFS	2.77	2.34	1.92	1.52	1.18	.91	.71	.55
25.30 CFS	.43							

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
.56 WATERSHED INCHES; 135 CFS-HRS; Runoff Volume = 11.2 ACRE-FEET.

DURATION(HRS)	2	4	6	8	10	12	14
FLOW(CFS)	15	8	6	5	4	4	0

TR20 ---------- SCS -
VERSION
11/30/** 2.04TEST
10:36:35 SUMMARY, JOB NO. 1 PAGE 2
SUMMARY TABLE 1

SELECTED RESULTS OF STANDARD AND EXECUTIVE CONTROL IN ORDER PERFORMED.
A CHARACTER FOLLOWING THE PEAK DISCHARGE TIME AND RATE (CFS) INDICATES:
F-FLAT TOP HYDROGRAPH T-TRUNCATED HYDROGRAPH R-RISING TRUNCATED HYDROGRAPH

XSECTION/ STRUCTURE ID	STANDARD CONTROL OPERATION	DRAINAGE AREA (SQ MI)	RUNOFF AMOUNT (IN)	PEAK DISCHARGE ELEVATION (FT)	TIME (HR)	RATE (CFS)	RATE (CSM)

RAINFALL OF 2.71 Inches AND 24.00 hr DURATION, BEGINS AT .0 hrs.
RAINTABLE NUMBER 2, ARC 2
MAIN TIME INCREMENT .100 HOURS
ALTERNATE 1 STORM 1

XSECTION 1	RUNOFF	.38	.56	---	12.60	57	150.0

Black Beauty Coal Company EVANSVILLE, INDIANA TR-20 Hydrograph Model Report SEP Mitigation Area Watershed Farmersburg Mine, IDNR #S-287	DATE: 11/30/2007 ENGINEER: TECH: ABN SHEET 3 OF 4	REVISION NO.: DATE: NOTES:

TR20 SCS - Version 2.04 Hydrograph Model
SEP Mitigation Wetland Direct Post-Mine Reclaimed Watershed
Runoff Storm Event 2yr/24hr; 3.111 Inches

EXECUTIVE CONTROL INCREM MAIN TIME INCREMENT = .100 HOURS
EXECUTIVE CONTROL COMPUT FROM XSECTION 1 TO XSECTION 1
STARTING TIME = .00 RAIN DEPTH = 3.11 RAIN DURATION = 1.00
ANT. RUNOFF COND. = 2 MAIN TIME INCREMENT = .100 HOURS
ALTERNATE NO. = 1 STORM NO. = 1 RAIN TABLE NO. = 2
OPERATION RUNOFF XSECTION 1
OUTPUT HYDROGRAPH = 6 Runoff AREA = ~240 acres, .38 SQ MI
INPUT RUNOFF CURVE = 70. TIME OF CONCENTRATION = 1.00 HOURS
COMPUTED INTERNAL TIME INCREMENT = .0923 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET) (RUNOFF)
12.57	85.5	

HYDROGRAPH POINTS FOR ALTERNATE = 1, STORM = 1
MAIN TIME INCREMENT = .100 hr, DRAINAGE AREA = .38 SQ.MI.

HRS								
11.70 CFS	.46	2.02	6.53	15.61	29.66	47.24	64.54	77.43
12.50 CFS	84.21	85.25	81.39	74.26	65.61	57.45	50.71	45.12
13.30 CFS	40.37	36.32	32.91	30.03	27.56	25.43	23.64	22.08
14.10 CFS	20.71	19.49	18.41	17.45	16.62	15.89	15.26	14.69
14.90 CFS	14.17	13.71	13.31	12.98	12.68	12.40	12.13	11.87
15.70 CFS	11.62	11.37	11.12	10.87	10.63	10.39	10.15	9.93
16.50 CFS	9.72	9.53	9.35	9.20	9.05	8.93	8.81	8.70
17.30 CFS	8.60	8.50	8.41	8.31	8.22	8.13	8.04	7.95
18.10 CFS	7.87	7.78	7.69	7.60	7.51	7.42	7.33	7.24
18.90 CFS	7.15	7.06	6.97	6.88	6.79	6.70	6.60	6.51
19.70 CFS	6.42	6.32	6.23	6.14	6.04	5.95	5.86	5.77
20.50 CFS	5.69	5.62	5.56	5.51	5.46	5.42	5.39	5.36
21.30 CFS	5.34	5.31	5.29	5.27	5.25	5.23	5.21	5.19
22.10 CFS	5.18	5.16	5.14	5.13	5.11	5.09	5.08	5.06
22.90 CFS	5.04	5.03	5.01	4.99	4.98	4.96	4.94	4.93
23.70 CFS	4.91	4.89	4.87	4.85	4.79	4.66	4.41	4.03
24.50 CFS	3.54	3.00	2.45	1.95	1.52	1.17	.91	.70
25.30 CFS	.55	.42						

RUNOFF ABOVE BASEFLOW (BASEFLOW = .00 CFS)
.78 WATERSHED INCHES; 188 CFS-HRS; Runoff Volume = 15.5 ACRE-FEET

DURATION(HRS)	2	4	6	8	10	12	14
FLOW(CFS)	21	11	8	6	5	5	0

TR20 ---------- SCS - VERSION 2.04TEST
11/30/** PAGE 2
10:37:49

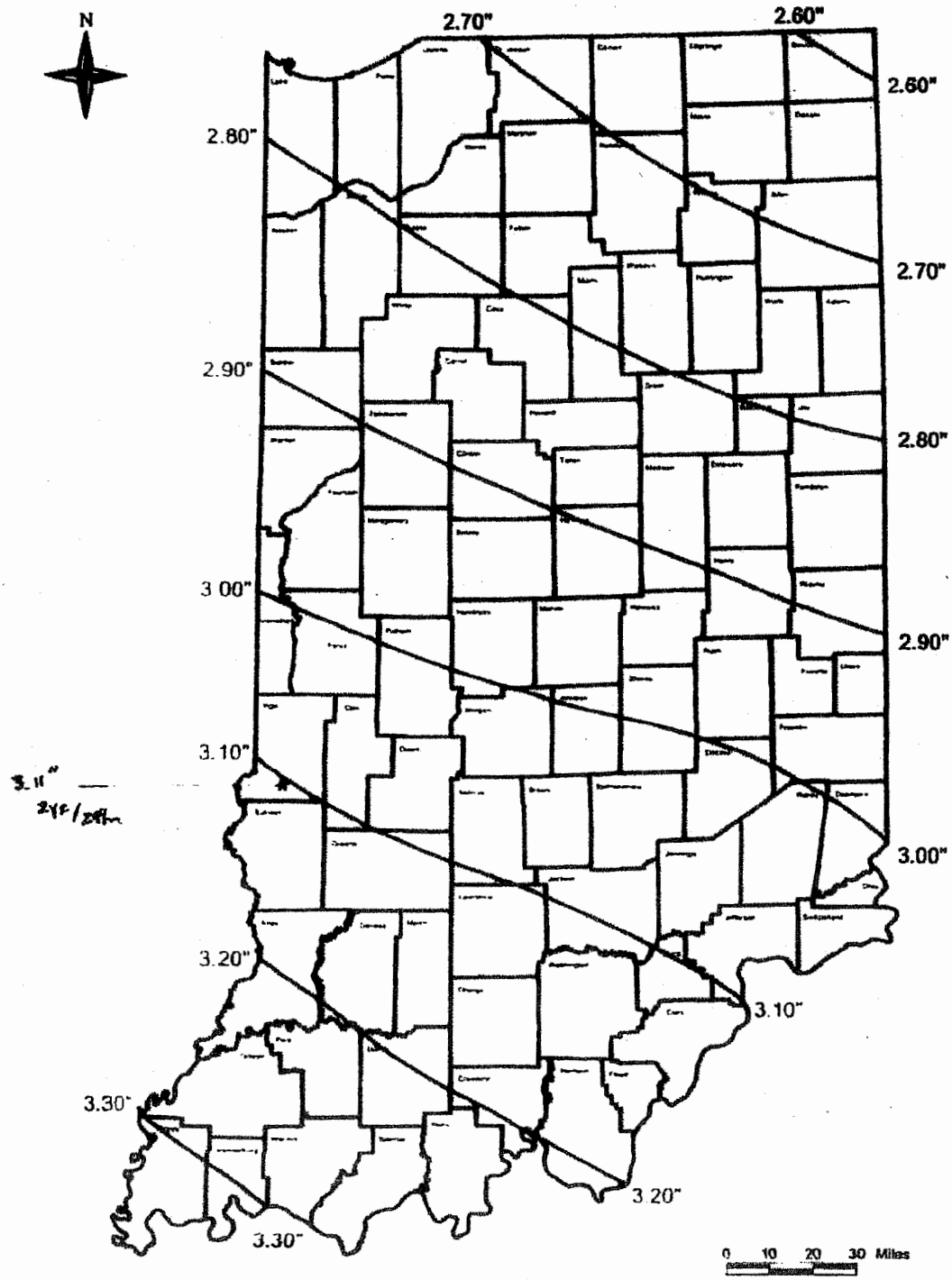
SUMMARY, JOB NO. 1
SUMMARY TABLE 1

SELECTED RESULTS OF STANDARD AND EXECUTIVE CONTROL IN ORDER PERFORMED.
A CHARACTER FOLLOWING THE PEAK DISCHARGE TIME AND RATE (CFS) INDICATES:
F-FLAT TOP HYDROGRAPH T-TRUNCATED HYDROGRAPH R-RISING TRUNCATED HYDROGRAPH

XSECTION/ STRUCTURE ID	STANDARD CONTROL OPERATION	DRAINAGE AREA (SQ MI)	RUNOFF AMOUNT (IN)	PEAK DISCHARGE ELEVATION (FT)	TIME (HR)	RATE (CFS)	RATE (CSM)
RAINFALL OF 3.11 Inches AND 24.00 hr DURATION, BEGINS AT .0 hrs.							
RAINTABLE NUMBER 2, ARC 2							
MAIN TIME INCREMENT .100 HOURS							
ALTERNATE 1 STORM 1							
XSECTION 1	RUNOFF	.38	.78	---	12.57	85	223.7

Black Beauty Coal Company EVANSVILLE, INDIANA TR-20 Hydrograph Model Report SEP Mitigation Area Watershed Farmersburg Mine, IDNR #S-287	DATE: 11/30/2007	REVISION NO.:	DATE:
	ENGINEER: TECH: ABN		
		NOTES:	
	SHEET 4 OF 4		

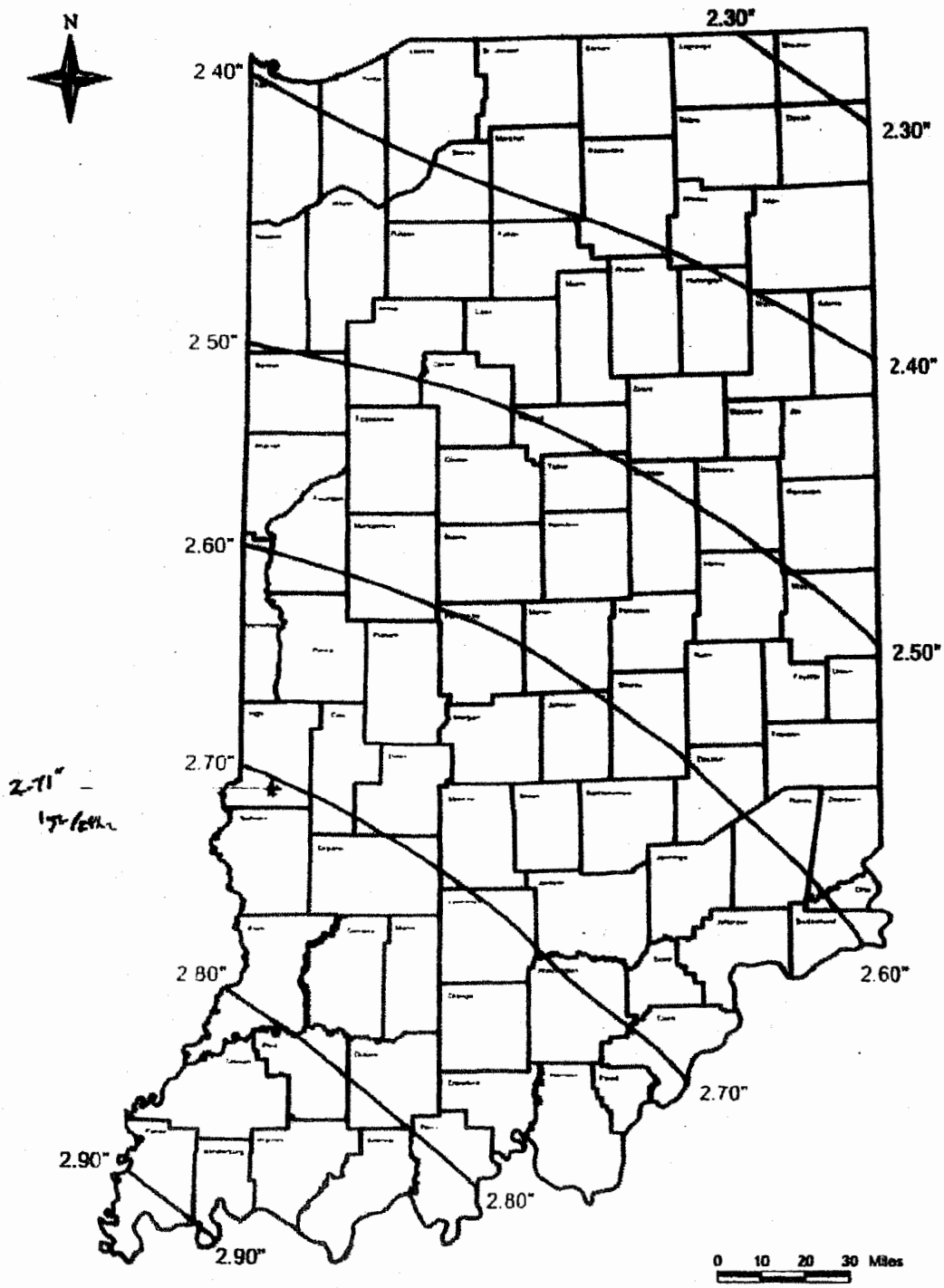
RAINFALL - 2 YEAR FREQUENCY - 24 HOUR DURATION



REFERENCE
TECHNICAL PAPER NO. 40
NATIONAL WEATHER SERVICE

STATE OF INDIANA
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF WATER

RAINFALL - 1 YEAR FREQUENCY - 24 HOUR DURATION



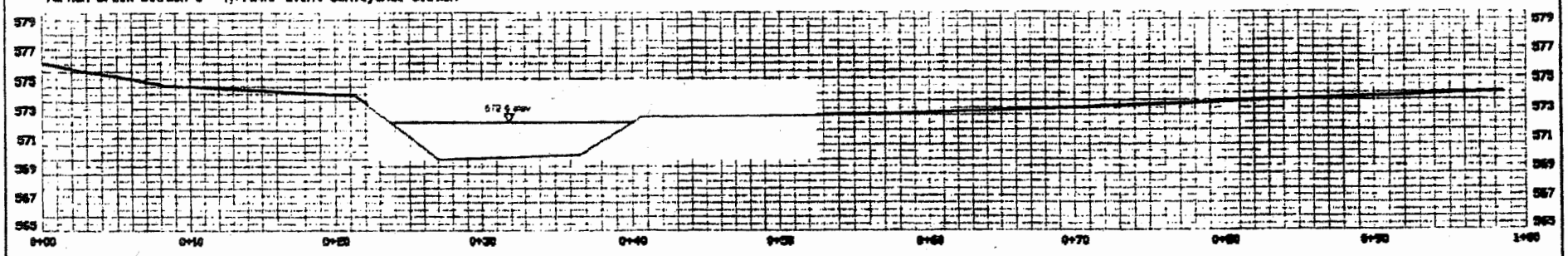
REFERENCE
TECHNICAL PAPER NO. 40
NATIONAL WEATHER SERVICE

STATE OF INDIANA
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF WATER

Turman Creek East Branch
Section 5
Existing Channel Conveyance
Rannings Predicted
1yr/24hr, 2.71 inch event

Channel
Dimensions
Wetted Perimeter: 17.90 ft
Area of Wetted Cross Section: [illegible] sq ft
Channel slope = 0.246%
Rannings n = [illegible]
Discharge: 97.00 cfs
Depth of Flow: 2.60 ft @ 572.6 ft elev.
Velocity: 3.08 fps
Channel Lining: Earth,Weeds/Cobble Bottom

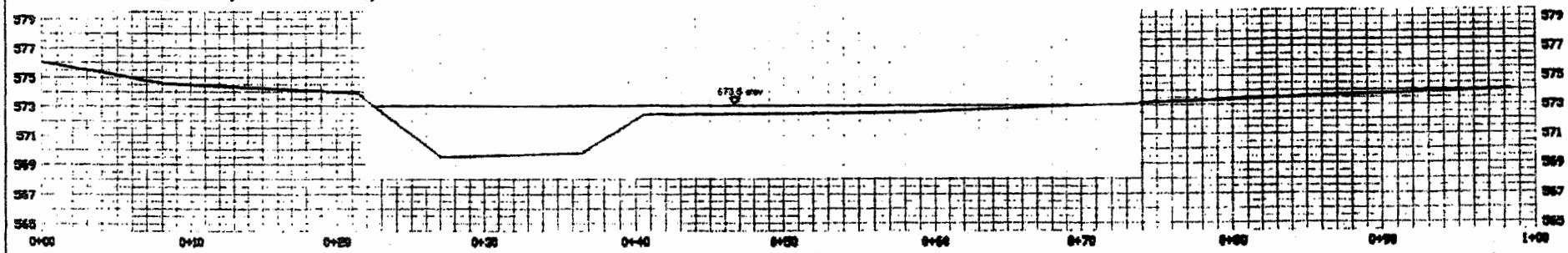
Turman Creek Section 5 1yr/24hr Event Conveyance Section



Turman Creek East Branch
Section 5
Existing Channel Conveyance
Rannings Predicted
2yr/24hr, 3.11 inch event

Channel
Dimensions
Wetted Perimeter: 50.40 ft
Area of Wetted Cross Section: [illegible] sq ft
Channel slope = 0.246%
Rannings n = [illegible]
Discharge: 148.50 cfs
Depth of Flow: 3.50 ft @ 573.5 ft elev.
Velocity: 2.37 fps
Channel Lining: Earth,Weeds/Cobble Bottom

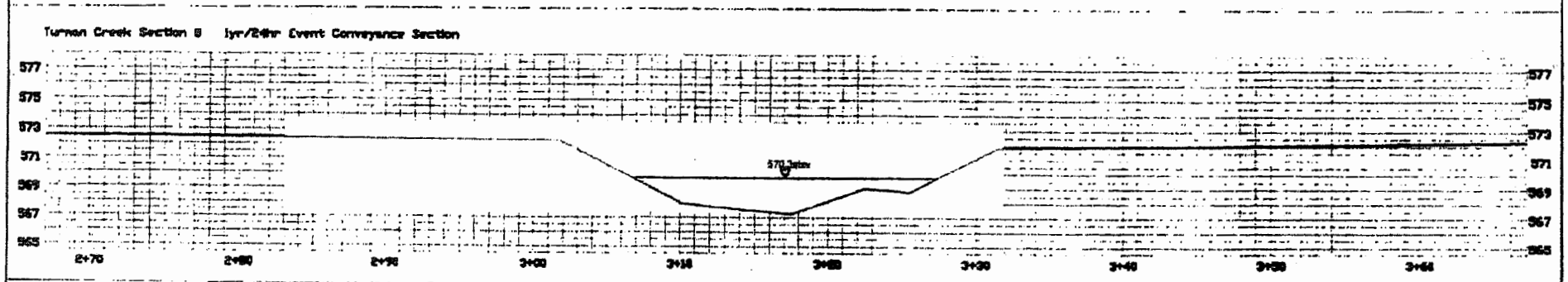
Turman Creek Section 5 2yr/24hr Event Conveyance Section



Black Beauty Coal Company EVANSVILLE, INDIANA Channel Conveyance Section 5 Turman Creek East Branch Farmersburg Mine, IDNR #S-287	DATE: 11/30/2007	REVISION NO.:	DATE:
	ENGINEER: TECH: ABN		
	SCALE: 1 in = 10 ft	NOTES:	
	SHEET 1 OF 3		

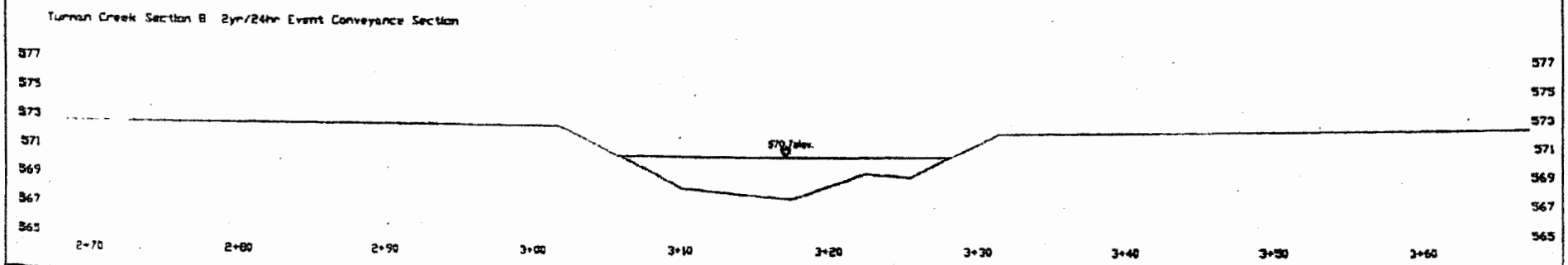
Turman Creek East Branch
Section 8
Existing Channel Conveyance
Mannings Equation Predicted
1yr/24hr, 2.71 inch Event

Channel
Dimensions:
Wetted Perimeter: 21.70 ft
Area of Wetted Cross Section: 30.38 sq ft
Channel slope = 0.0350%
Mannings n = 0.0350
Discharge: 96.16 cfs
Depth of Flow: 2.50 feet @ 570.3 ft elev.
Velocity: 3.17 fps
Channel Lining: Earth,Weeds/Cobble Bottom



Turman Creek East Branch
Section 8
Existing Channel Conveyance
Manning Equation Predicted
2yr/24hr, 3.11 inch event

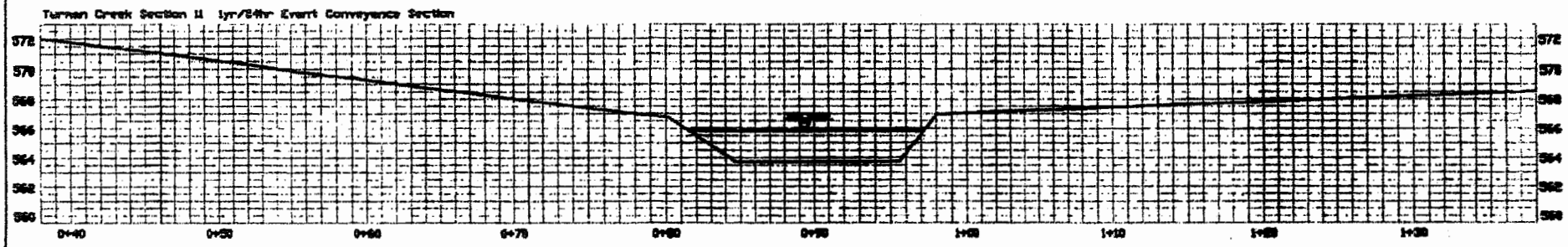
Channel
Dimensions:
Wetted Perimeter: 23.50 ft
Area of Wetted Cross Section: 38.50 sq ft
Channel slope = 0.0350%
Mannings n = 0.0350
Discharge: 138.28 cfs
Depth of Flow: 2.98 feet @ 570.7 ft elev.
Velocity: 3.55 fps
Channel Lining: Earth,Weeds/Cobble Bottom



Black Beauty Coal Company EVANSVILLE, INDIANA Channel Conveyance Section 8 Turman Creek East Branch Farmersburg Mine, IDNR #S-287	DATE: 11/30/2007	REVISION NO.:	DATE:
	ENGINEER: TECH: ABN		
	SCALE: 1 in = 10 ft	NOTES:	
	SHEET 2 OF 3		

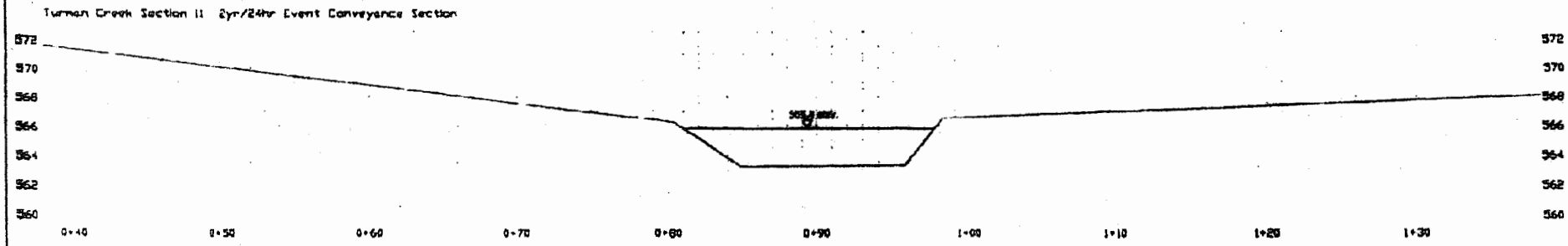
Turman Creek East Branch
Section 11
Existing Channel Conveyance
Mannings Equation Predicted
1yr/24hr, 2.71 inch event

Channel
Dimensions
Wetted Perimeter: 17.30 ft
Area of Wetted Cross Section: 27.78 sq ft
Channel slope = 0.3358%
Mannings n = 0.0356
Discharge: 96.31 cfs
Depth of Flow: 2.10 ft @ 566.3 ft elev.
Velocity: 3.48 fps
Channel Lining: Earth,Weeds/Cobble Bottom



Turman Creek East Branch
Section 11
Existing Channel Conveyance
Mannings Equation Predicted
2yr/24hr, 3.11 inch event

Channel
Dimensions
Wetted Perimeter: 18.80 ft
Area of Wetted Cross Section: 35.58 sq ft
Channel slope = 0.3358%
Mannings n = 0.0356
Discharge: 140.37 cfs
Depth of Flow: 2.60 ft @ 566.8 ft elev.
Velocity: 3.91 fps
Channel Lining: Earth,Weeds/Cobble Bottom



Black Beauty Coal Company EVANSVILLE, INDIANA Channel Conveyance Section 11 Turman Creek East Branch Farmersburg Mine, IDNR #S-287	DATE: 11/30/2007	REVISION NO.:	DATE:
	ENGINEER: TECH: ABN		
	SCALE: 1 in = 10 ft	NOTES:	
	SHEET 3 OF 3		