Public Notice

US Army Corps of Engineers
Huntington District

In reply refer to: **Public Notice No.** 200300238
Issuance Date: August 24, 2003
Stream: UT Abbott Creek
Expiration Date: September 23, 2004

Address comments to: US Army Corps of Engineers, Huntington District
502 Eighth Street
ATTN: CELRH-F
Huntington, West Virginia 25701-2070

TO WHOM IT MAY CONCERN: The following application has been submitted for a Department of the Army Permit under the provisions of Section 404 of the Clean Water Act. This notice serves as the Corps of Engineers' request to the West Virginia Department of Environmental Protection to act on Section 401 Water Quality Certification for the following application.

APPLICANT: Hanna Land Company LLC
Post Office Box 2814
Charleston, West Virginia 25330

LOCATION: The proposed project is located in unnamed tributaries of Long Branch and Abbott Creek approximately 1.5 miles south of Carbon, Kanawha County, West Virginia as depicted on the attached Figure 1. The location of the proposed valley fills and associated sediment ponds are also depicted on Figure 1.

DESCRIPTION OF THE PROPOSED WORK: The applicant proposes to place fill material into waters of the United States in conjunction with the construction of four valley fills, four sediment ponds, and the upgrade of an existing haul road at the Republic No. 1 Surface Mine. According to the applicant, the purpose of the project is to construct valley fills to dispose of excess overburden spoil generated by surface mining operations into waters of the United States in order to achieve optimal recovery of available coal reserves within the project area and to provide the mandatory sediment control and access.

The construction of the proposed valley fills would result in the permanent discharge of fill material into approximately 9,833' (0.84 acre) of four jurisdictional stream channels. Of this total, approximately 8,658' of intermittent stream and 1175' of ephemeral stream would be impacted. Approximately 100' of intermittent stream channel would be impacted by secondary impacts associated with sediment transport. The construction of the four sediment ponds would result in the temporary discharge of fill material into 2,700' (0.28 acre) of intermittent stream channel. A total of 12,633' (1.12 acres) of waters of the United States would be impacted by the proposed surface coal mining activities. Tables A and B of this public notice provide additional information regarding the proposed impacts sites and watershed acreages.

The West Virginia Department of Environmental Protection (WVDEP) issued the required Surface Mining Permit (S-3025-00) on October 6, 2003 and the required NPDES permit (WV1019414) on November 20, 2003.

The applicant's proposed operation would affect 900 acres of surface area in order to facilitate removal of approximately 11.9 million tons of coal available in the 5-Block, Clarion, Upper Stockton, Stockton-Lewisburg, Upper Coalburg, and Lower Coalburg seams. Coal extraction would be accomplished utilizing mountaintop removal mining techniques. The proposed operation would generate approximately 89 million cubic yards of overburden (including the 20% swell factor) of which approximately 83 million cubic yards would be placed on the mined areas as backfill. The remaining approximate 6 million cubic yards of excess overburden would be placed in the proposed valley fills as detailed on the Table C of this public notice.

The proposed project would be accomplished in five phases over a period of 5 years. A discussion of each phase follows:

Phase I: Phase I would consist of coal removal activities on 356 acres. Haul Road A would be upgraded by widening the existing road to current standards. The existing 78" steel pipe culvert would be replaced with a 7' x 10' box culvert. The embankments associated with Pond 33 below Valley Fill No. 4 and Pond 34 below Valley Fill No. 3 would be constructed. Temporary sediment control measures (on-bench sediment channels) would be installed as provided for in the approved temporary sediment control plan. Concurrent mining of all seams would take place during this phase. Excess spoil generated during mining would be placed into Valley Fill No. 4 and No. 3. It is anticipated Phase I would begin in November 2004 and conclude in November 2006.

Phase II: Phase II would consist of concurrent coal removal within all seams. The embankment associated with Pond 35 would be constructed below Valley Fill No. 2. Temporary sediment control measures would be installed as provided for in the approved temporary sediment control plan. Excess spoil generated during mining would be placed into Valley Fill No. 2. Placement of excess spoil into Valley Fill No. 4 would be completed and reclamation activities would be commenced. It is anticipated Phase II would begin in November 2006 and would conclude in November 2008.

Phase III: Phase III would consist of concurrent coal removal within all seams. The embankment associated with Pond 32 below Valley Fill No. 1 would be constructed. Temporary sediment control measures would be installed as provided for in the approved temporary sediment control plan. Excess spoil generated during mining would be placed into Valley Fill No. 1 and Valley Fill No. 2. Placement of excess spoil into Valley Fill No. 3 would be completed and reclamation activities would be commenced. It is anticipated Phase III would begin in November 2008 and would conclude in November 2009.

Phase IV: Phase IV would consist of the completion of all regarding at the site and final reclamation of the entire permit area.

A description of the mining and reclamation acreage, by phase, is also provided on the Table D of this public notice.

MITIGATION PLAN: In order to compensate for the permanent loss of approximately 9,833' (0.84 acre) of intermittent and ephemeral stream channel, the applicant proposes both on-site and off-site migration. Off-site mitigation would consist of restoration and enhancement activities within Cabin Creek, Long Branch, and Fifteenmile Fork near Decota, Kanawha County, West Virginia. The applicant has received authorization from this office under nationwide permit #27 to conduct the restoration and enhancement activities within approximately 17,143' of Cabin Creek, 11,242' of Long

Branch and 1,825' of Fifteenmile Creek. The proposed restoration and enhancement activities include reduction of sediment run-off, improvement of in-stream and riparian habitat, removal of trash and debris, stabilization of eroded and collapsed stream banks, installation of proper road crossing and the establishment of riparian vegetation. The applicant would then utilize the enhanced and restored stream channels as compensatory mitigation for future impacts associated with the proposed surface coal mining activities within the effected watershed.

The applicant has requested authorization to utilize 8,658' of the restored/enhanced stream channels as compensatory mitigation for permanent impacts to 8,658' of intermittent tributaries of Long Branch and Abbott Creek. Approval of this request would be contingent upon actual completion of the restoration/enhancement activities within the stream channels, concurrence of the commenting agencies, and analysis of quality, functions, and values of resources lost at the impact site as compared to quality, functions, and values of resources gained at the mitigation sites. The applicant is aware that utilization of the restored/enhanced stream channels may not be acceptable as sole compensation for permanent impacts associated with the mining activities. Figure 13 depicts the geographic relationship between the proposed impact sites and the proposed mitigation sites.

To compensate for permanent impacts to 1175' of ephemeral unnamed tributaries of Abbott Creek, the applicant proposes to utilize on-bench sediment channels by converting them into ephemeral, sinuous stream channels. Approximately 1000' of an on-bench sediment channel would be converted into an ephemeral stream channel. The sediment channels are designed to handle a 2-year flood event within the primary channel and a 100-year flood event within the secondary channel. The channels contain several barriers to form individual holding cells. To create sinuosity, sections of the barriers would be removed breached. Because of the flat channel slope, it is anticipated that once the section is removed and water levels subside, a sinuous channel would form within the sediment-laden cells. It is also anticipated that because of the organic sediments within the cells, a variety of grasses and other semi-aquatic planes would develop within the secondary channels. The portions of the barriers left in place, as well as the addition of root wads, boulders, and log weirs would provide in-stream habitat, nutrients, and substrate. A vegetated riparian zone, consisting of but not limited to reed canary grass, orchid grass, millet grass, redtop grass, bankers dwarf willow, purpleozier willow, silky dogwood, smooth alder, arrowwood viburnum, spicebush, yellow poplar, sycamore, silver and red maple, black walnut, and red oak, would be established along the stream channels. Figure 14 depicts the location of the on-site mitigation for permanent impacts.

To compensate for temporary impacts to 2,170' of intermittent tributaries associated with construction of four sediment control structures, the applicant proposes to restore each stream channel to its pre-mining conditions. Stream surveys have been conducted for each stream channel proposed for impact to ensure restoration based on original stream habitat parameters and physical dimensions. Upon completion of mining activities and upon release of the Phase II bond, restoration activities would take place. All restoration activities would take place during low-flow periods. The sediment pond would be dewatered and immediately seeded and mulched to stabilize the area. A two-stage channel would be constructed based on the pre-mining physical dimensions. In-stream habitat structures, such as boulders, root-wads, logs, would be added to the stream channel. A 50-foot riparian buffer, 25' on each side of the stream, would be established along the restored stream channels. The species listed above would be planted within the riparian buffer. Figure 15 depicts the location of on-site mitigation for temporary impacts.

All restored stream channels will be monitored for a five year period.

Plans of the proposed work are attached to this public notice.

WATER QUALITY CERTIFICATION: A Section 401 Water Quality Certification is required for this project. It is the applicant's responsibility to obtain certification from the West Virginia Department of Environmental Protection.

HISTORIC AND CULTURAL RESOURCES: The National Register of Historic Places (NRHP) has been consulted and it has been determined there are no properties currently listed on the register that are in the area affected by the project. A copy of this public notice will be sent to the State Historic Preservation Office for their review. Comments concerning archeological sensitivity of a project area should be based upon collected data.

ENDANGERED/THREATENED SPECIES REVIEW: The project is located within the known or historic range of the Indiana bat, a federally listed endangered species. The applicant has provided information to the United States Fish and Wildlife Service regarding Indiana bat summer roosting habitat within the proposed mining area. Based on the amount of habitat within the mining area, the applicant has proposed to conduct seasonal clearing during the period between November 15 and March 31. This public notice serves as a request to the U.S. Fish and Wildlife Service for any additional information they may have on whether any listed or proposed to be listed endangered or threatened species may be present in the area which would be affected by the activity, pursuant to Section 7(c) of the Endangered Species Act of 1972 (as amended).

PUBLIC INTEREST REVIEW AND COMMENT: Any person who has an interest that may be adversely affected by the issuance of a permit may request a public hearing. The request must be submitted in writing to the District Engineer on or before the expiration date of this notice and must clearly set forth the interest which may be adversely affected and the manner in which the interest may be adversely affected by the activity.

Interested parties are invited to state any objections they may have to the proposed work. The decision whether to issue a permit will be based on an evaluation of the probable impact including cumulative impacts of the proposed activity on the public interest. That decision will reflect the national concern for both protection and utilization of important resources. The benefit that reasonably may be expected to accrue from the proposal must be balanced against its reasonably foreseeable detriments. All factors that may be relevant to the proposal will be considered including the cumulative effects thereof; of those are conservation, economics, aesthetics, general environmental concerns, wetlands, historic properties, fish and wildlife values, flood hazards, floodplain values, land use, navigation, shoreline erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs, considerations of property ownership and, in general, the needs and welfare of the people. In addition, the evaluation of the impact of the activity on the public interest will include application of the guidelines promulgated by the Administrator, Environmental Protection Agency, under the authority of Section 404(b)(1) of the Clean Water Act. Written statements on these factors received in this office on or before the expiration date of this public notice will become a part of the record and will be considered in the final determination. A permit will be granted unless its issuance is found to be contrary to the public interest.

The Corps of Engineers is soliciting comments from the public; Federal, state, and local agencies and officials; Indian Tribes; and other interested parties in order to consider and evaluate the impacts of this proposed activity. Any comments received will be considered by the Corps of Engineers to determine whether to issue, modify, condition or deny a permit for this proposal. To make this decision, comments are used to assess impacts on endangered species, historic properties, water quality, general environmental effects, and the other public interest factors listed above. Comments are used in the preparation of an Environmental Assessment and/or an Environmental Impact Statement pursuant to the National Environmental Policy Act. Comments are also used to determine the need for a public hearing and to determine the overall public interest of the proposed activity.

If you have any questions concerning this public notice, please call Kimberly Courts-Brown at 304-399-5210.

for Mark A. Taylor
Ginger Mullins, Chief
Regulatory Branch

(W)

Table A
Hanna Land Company LLC.
Republic No. 1 Surface Mine
Jurisdictional Waters Impact Summary

Structure	Permanent Intermittent		Permanent Ephemeral		Temporary Intermittent		Temporary Ephemeral		Secondary Intermittent		Secondary Ephemeral	
	feet	acres	Feet	Acres	feet	acres	feet	acres	feet	acres	feet	acres
Valley Fill No. 1 UN Trib Long Br.	2300	0.211										
Pond No. 32					900	0.105						
Valley Fill No. 2 UN Trib Abbott Cr.	2359	0.238	1016	0.096								
Pond No. 35					700	0.080						
Valley Fill No. 3 UN Trib Abbott Cr.	2241	0.175	159	0.012								
Pond No. 34					600	0.051						
Valley Fill No. 4	1758	0.109							100	0.008		
Pond No. 33					500	0.038						
Total	**8,658**	**0.733**	**1,175**	**0.108**	**2,700**	**0.274**	**0**	**0.000**	**100**	**0.008**	**0**	**0.000**

Table B

Hanna Land Company LLC.
Republic No. 1 Surface Mine
Affected Drainage Areas

Disposal Site	**Drainage Area Fill Toe (acres)**
Valley Fill 1	133.73
Valley Fill 2	96.16
Valley Fill 3	97.93
Valley Fill 4	121.01
	448.83

Table C
Hanna Land Company LLC
Republic No. 1 Surface Mine
Total Fill Volume/Valley Fill Disposal Site

Disposal Site	**Fill Volume Cubic Yards**
Valley Fill 1	7,428,802
Valley Fill 2	12,863,821
Valley Fill 3	10,466,282
Valley Fill 4	7,557,847
Total	**38,316,752**

Table D
Hanna Land Company LLC
Republic No. 1 Surface Mine
Mining and Reclamation Schedule

PHASE	**MINING***			**RECLAMATION**			**UNRECLAIMED**
	START	**END**	**ACRES**	**START**	**END**	**ACRES**	**ACRES**
I	11/2004	11/2006	356.1	N/A	N/A		356.1
II	11/2006	11/2008	620.8	11/2008	11/2010	243.6	386.2
III	11/2008	11/2009	878.2	11/2009	11/2012	507.1	371.2
IV	N/A	N/A	990.0	11/2012	5/2012	934.8	55.2

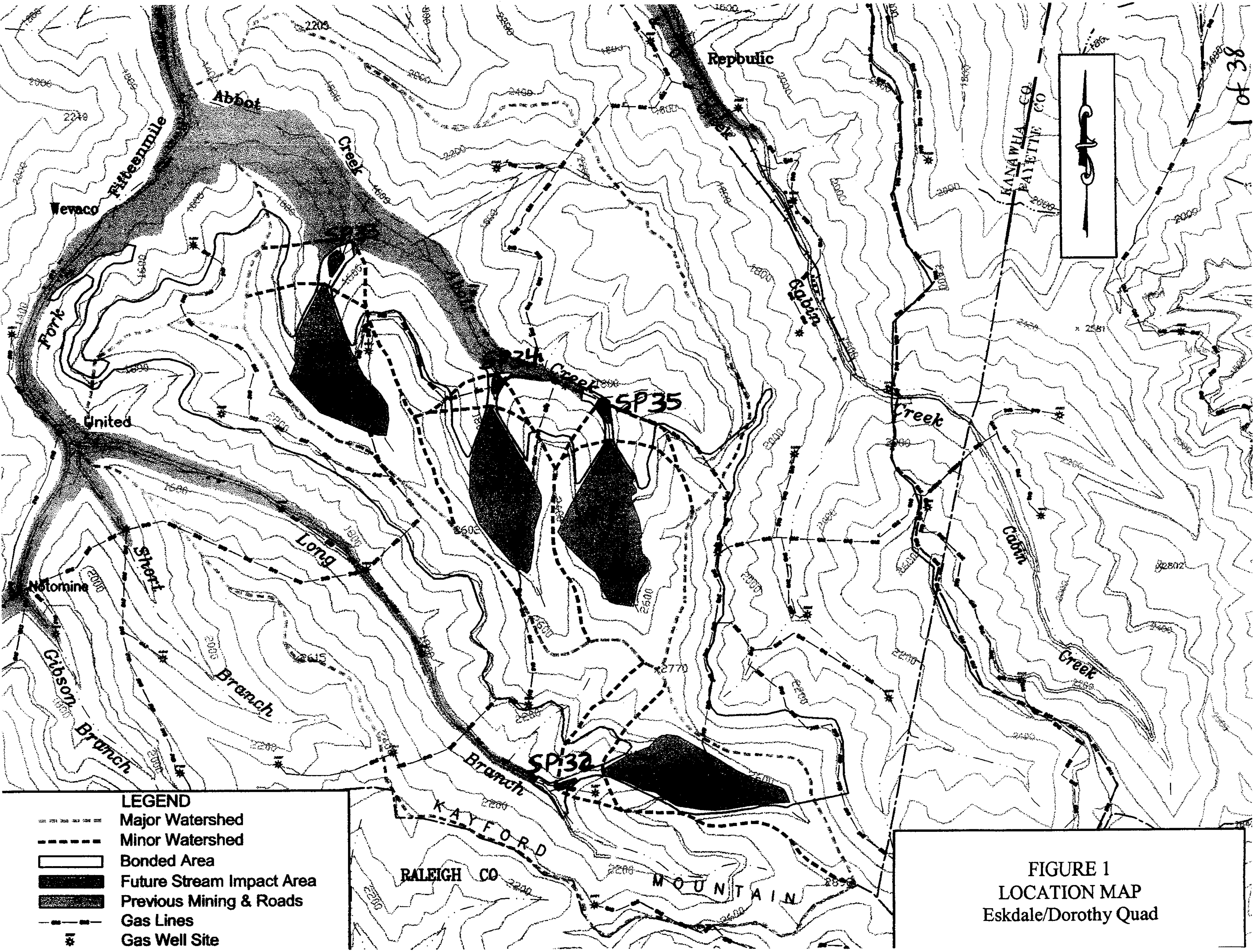
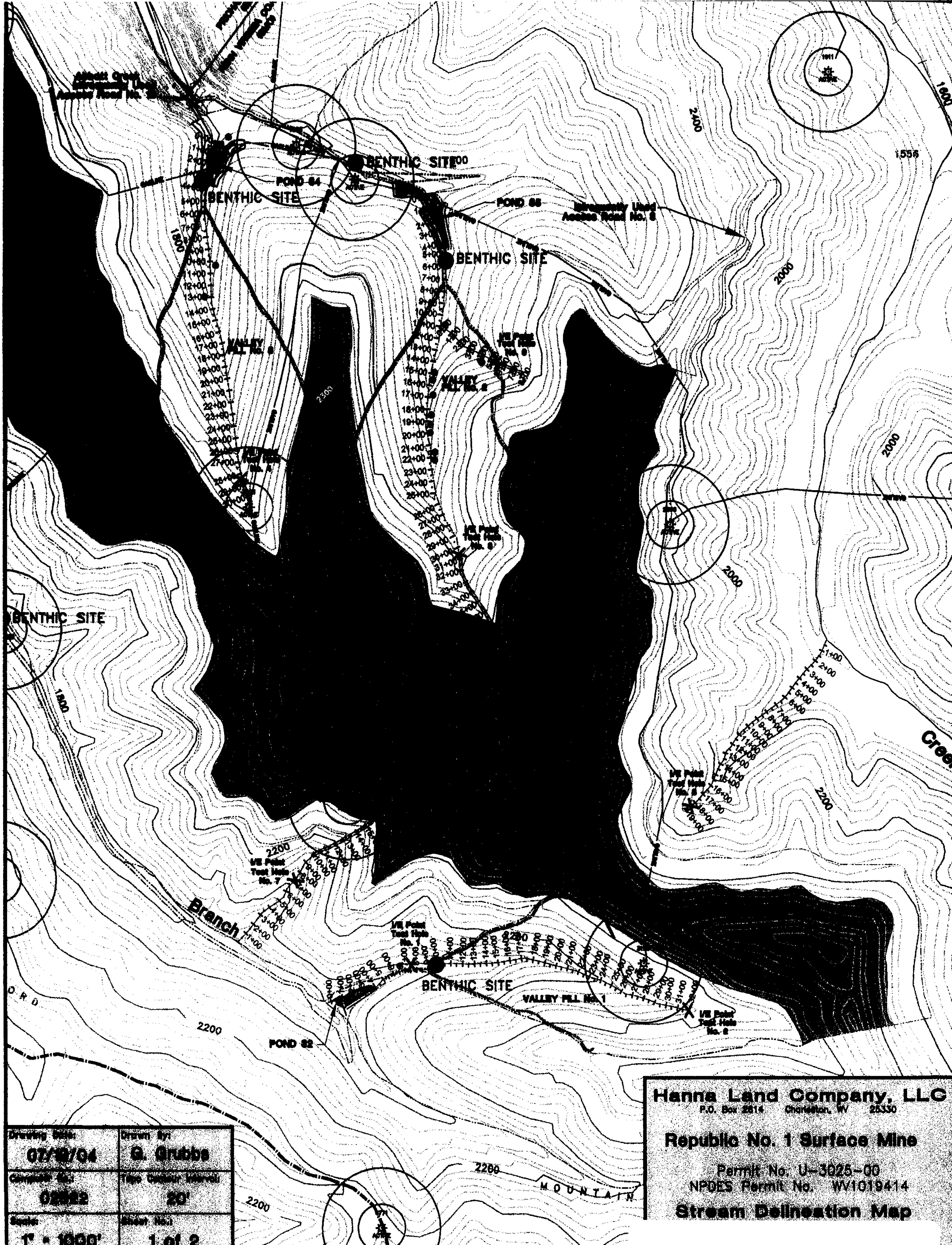


FIGURE 1
LOCATION MAP
Eskdale/Dorothy Quad



BENTHIC SITE
POND 84
BENTHIC SITE
POND 85
BENTHIC SITE
VALLEY FILL No. 2
BENTHIC SITE
Branch
BENTHIC SITE
VALLEY FILL No. 1
POND 82
MOUNTAIN
Creek
2400
2000
2200
1800
Hanna Land Company, LLC
P.O. Box 2814 Charleston, WV 25330
Republic No. 1 Surface Mine
Permit No. U-3025-00
NPDES Permit No. WV1019414
Stream Delineation Map
Drawing Date:
07/9/04
Drawn By:
G. Grubbs
Topo Contour Interval:
20'
Scale:
1" = 1000'
Sheet No.:
1 of 2

FIGURE 2

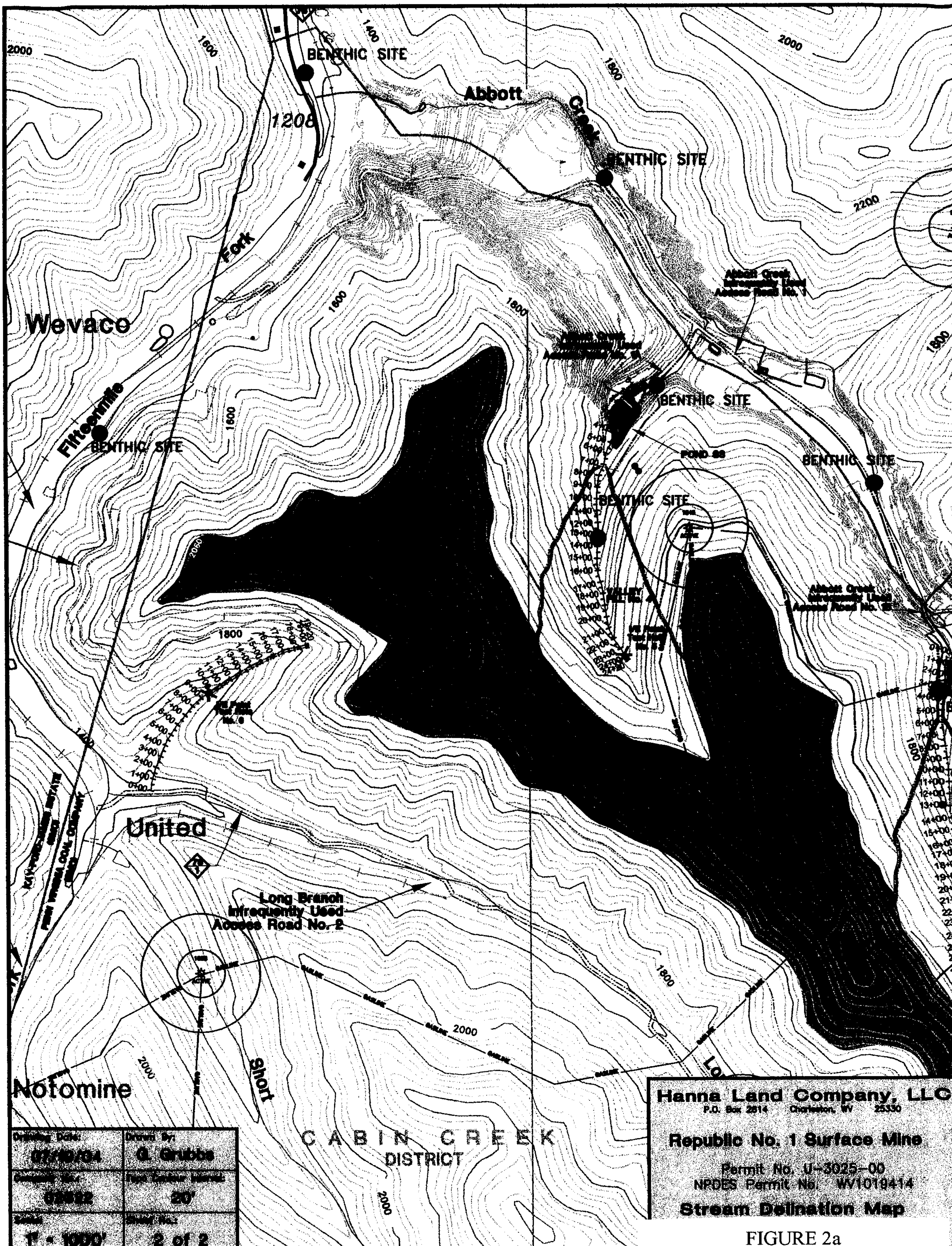
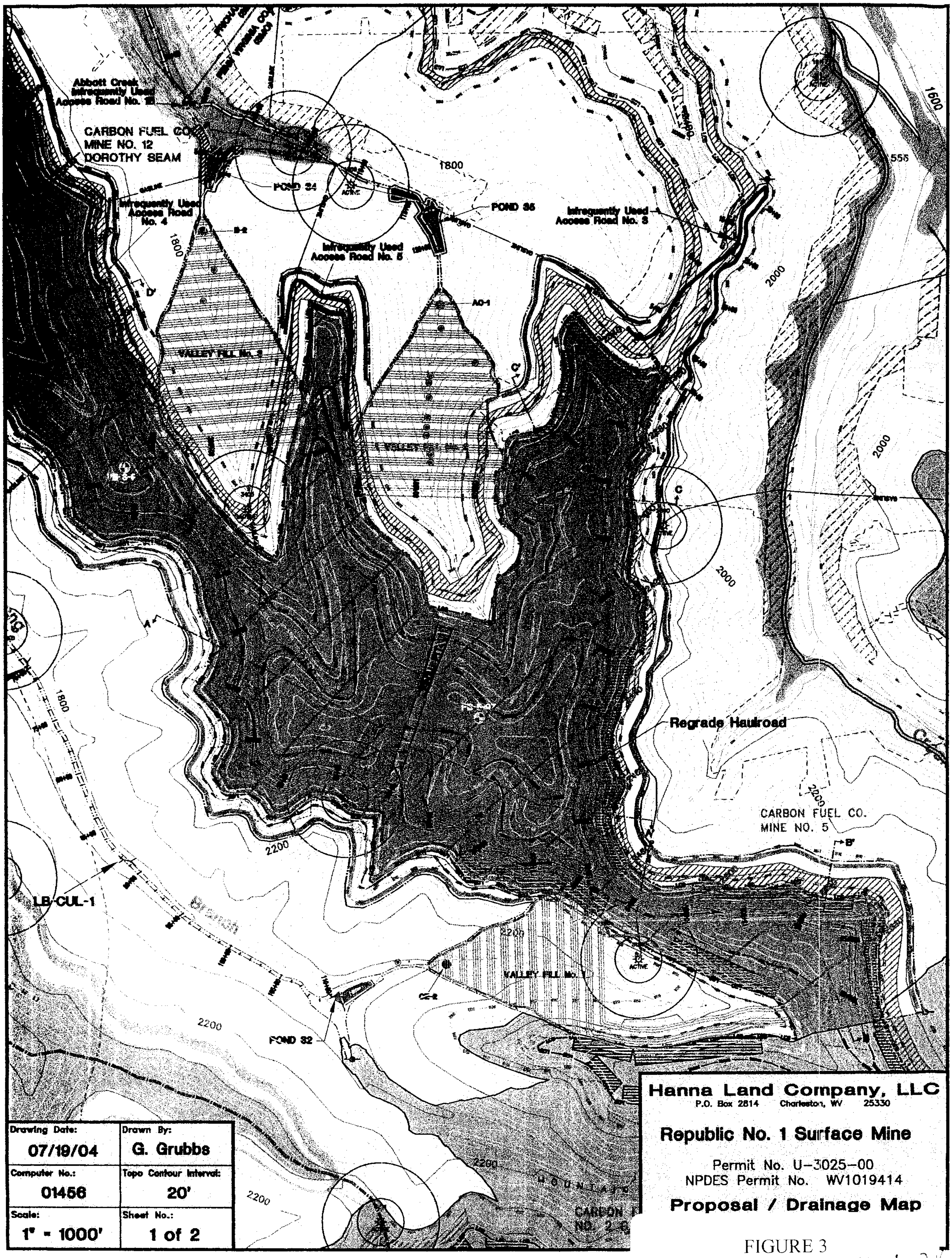


FIGURE 2a

3 of 38



Abbott Creek Infrequently Used Access Road No. 12
CARBON FUEL CO. MINE NO. 12 DOROTHY SEAM
POND 34
POND 35
1800
Infrequently Used Access Road No. 4
Infrequently Used Access Road No. 5
Infrequently Used Access Road No. 3
VALLEY FILL No. 3
VALLEY FILL No. 4
AO-1
D'
C'
C
2000
1600
556
Regrade Haulroad
2200
CARBON FUEL CO. MINE NO. 5
B'
LB-CUL-1
Branch
VALLEY FILL No. 1
ACTIVE
POND 32
Hanna Land Company, LLC
P.O. Box 2814 Charleston, WV 25330
Republic No. 1 Surface Mine
Permit No. U-3025-00
NPDES Permit No. WV1019414
Proposal / Drainage Map
Drawing Date: 07/19/04
Drawn By: G. Grubbs
Computer No.: 01456
Topo Contour Interval: 20'
Scale: 1" = 1000'
Sheet No.: 1 of 2

FIGURE 3

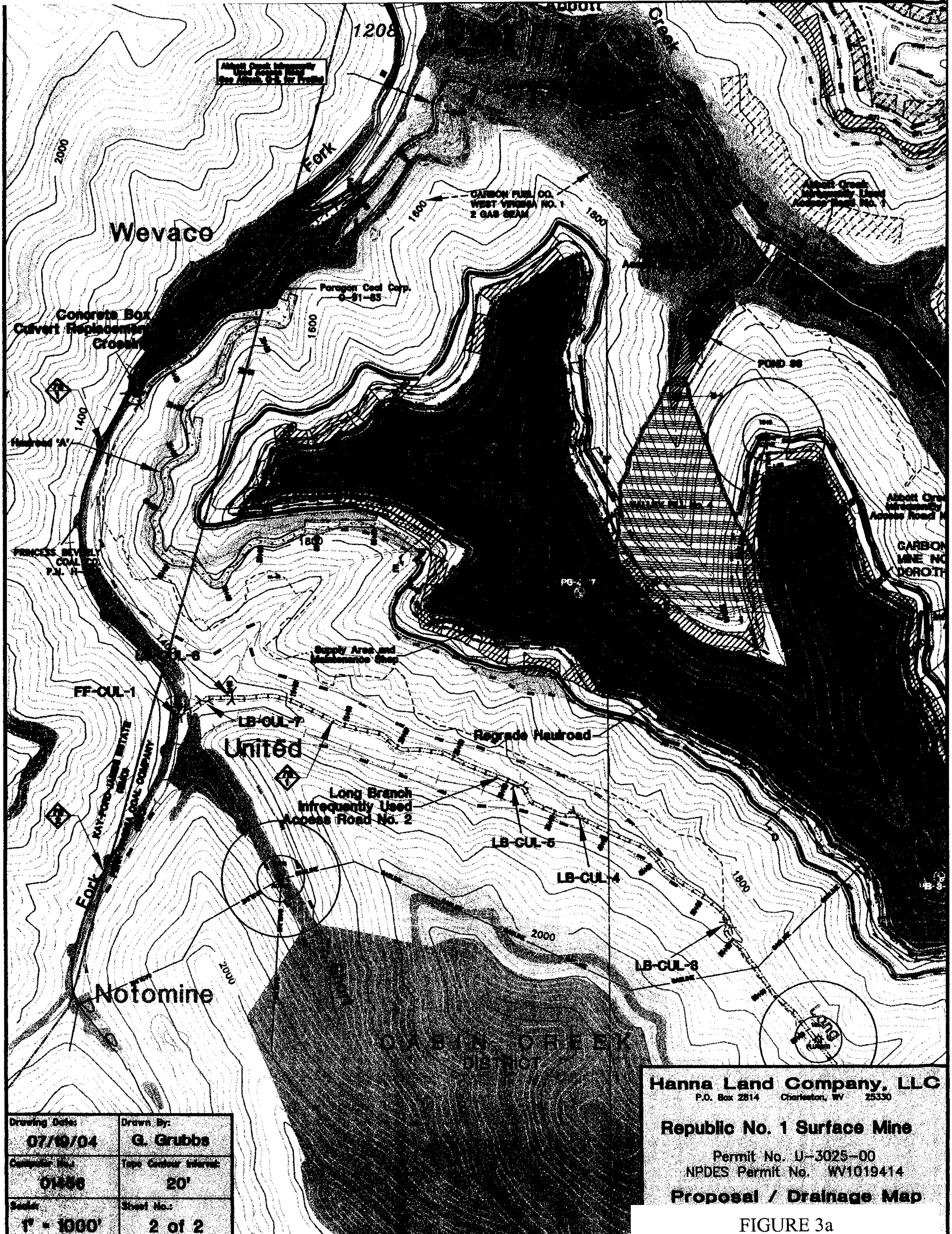

1208
Fork
Wevaco
CARBON FUEL CO.
WEST VIRGINIA NO. 1
2 GAS SEAM
1600
1800
Paragon Coal Corp.
Concrete Box
Haulroad 'A'
1400
PRINCESS BEVERLY
COAL CO.
POND 98
Supply Area and
Maintenance Shop
FF-CUL-1
LB-CUL-7
Regrade Haulroad
United
Long Branch
Infrequently Used
Access Road No. 2
LB-CUL-5
LB-CUL-4
LB-CUL-8
2000
Notomine
CABIN CREEK
DISTRICT
Drawing Date:
07/19/04
Drawn By:
G. Grubbs
Topo Contour Interval:
20'
Scale:
1" = 1000'
Sheet No.:
2 of 2
Hanna Land Company, LLC
P.O. Box 2814 Charleston, WV 25330
Republic No. 1 Surface Mine
Permit No. U-3025-00
NPDES Permit No. WV1019414
Proposal / Drainage Map

FIGURE 3a

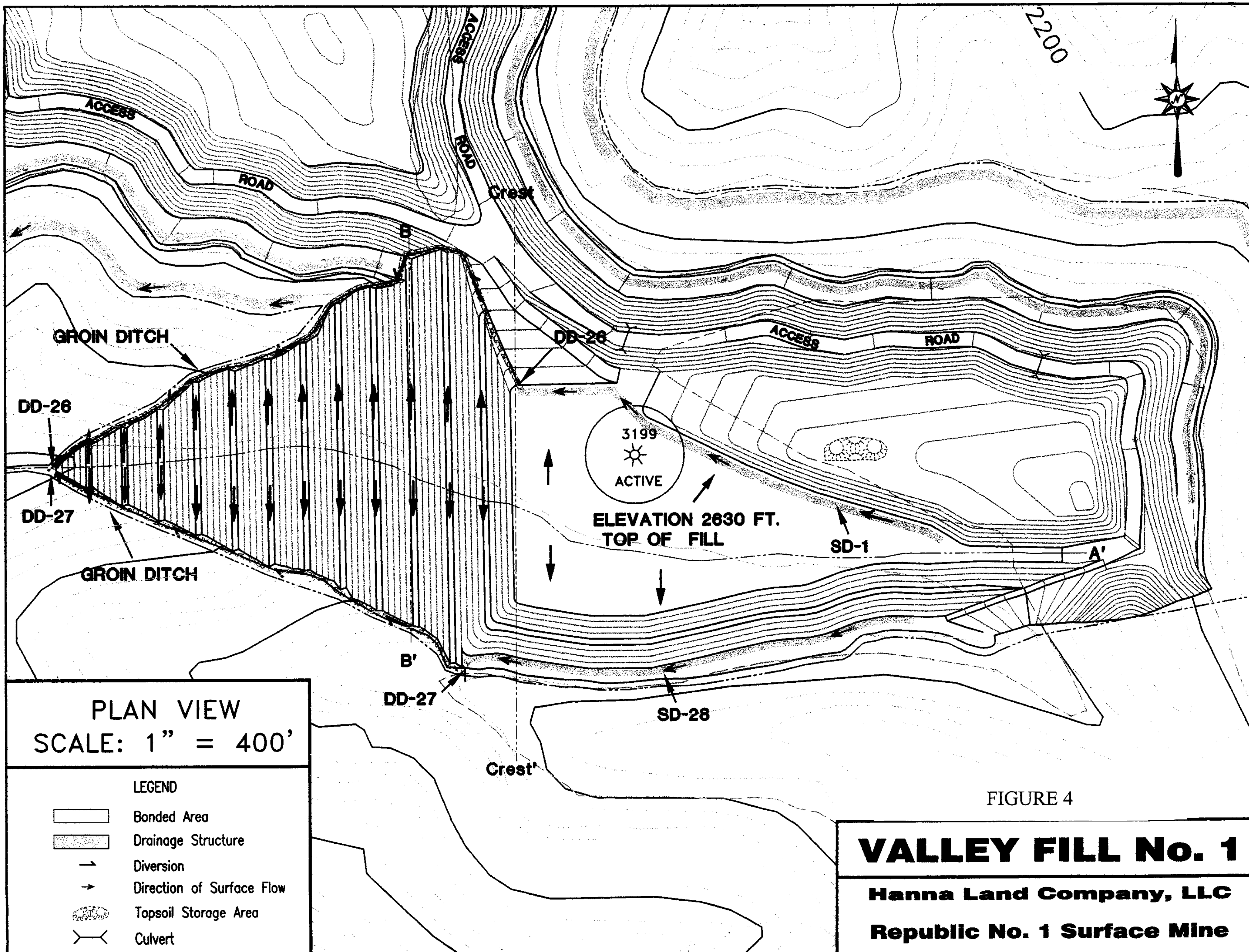
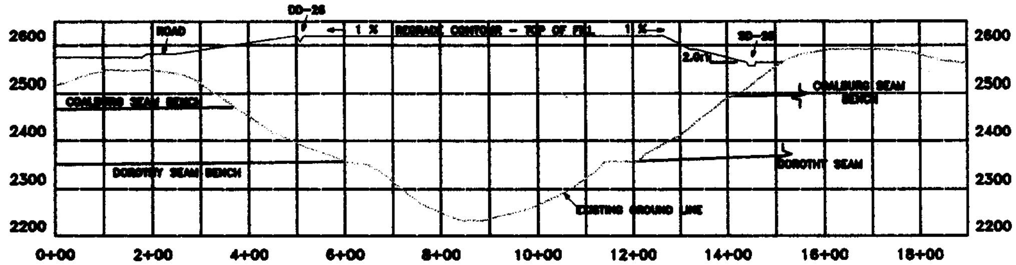


FIGURE 4

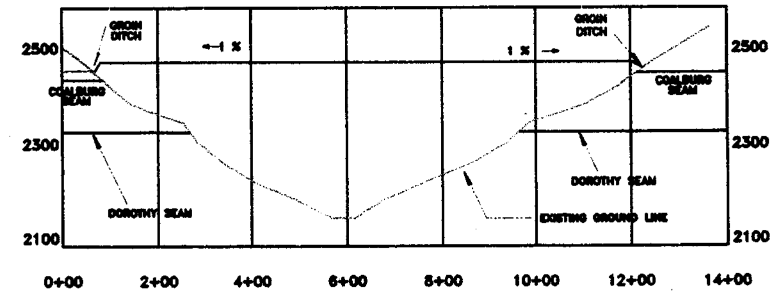
VALLEY FILL No. 1

Hanna Land Company, LLC

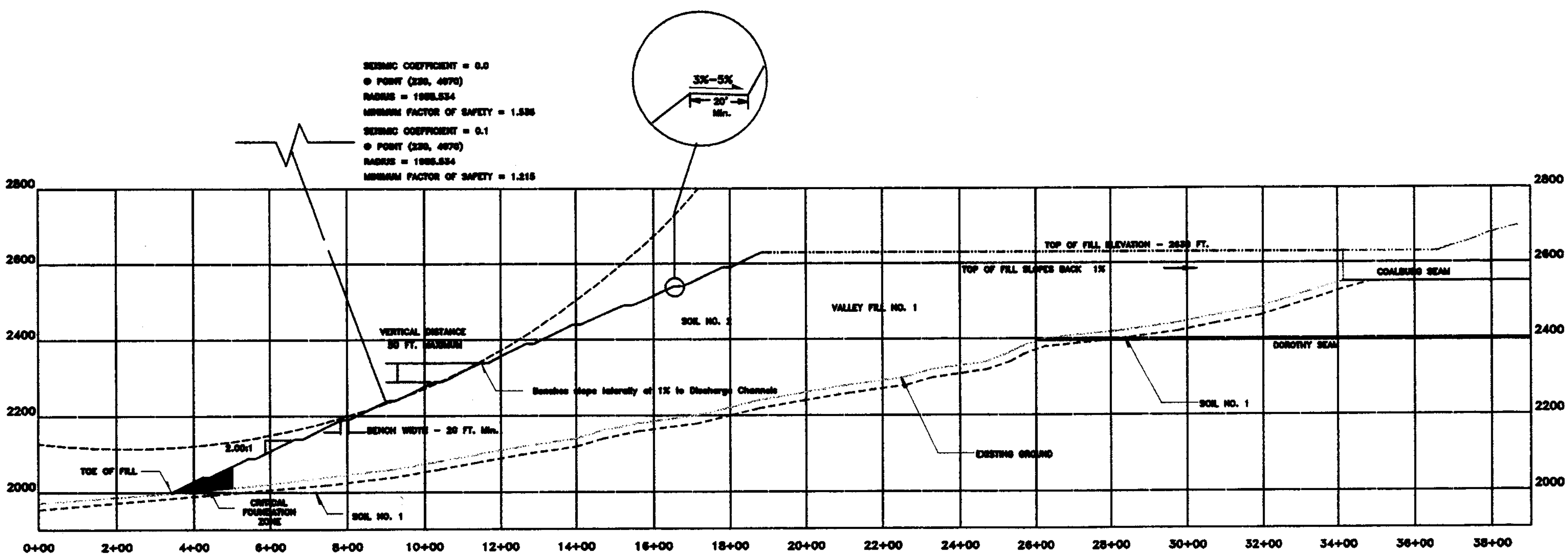
Republic No. 1 Surface Mine



CROSS–SECTION CREST – CREST'
SCALE: 1" = 400'



CROSS–SECTION B – B'
SCALE: 1" = 400'



PROFILE – A–A'
SCALE: 1" = 400'

FIGURE 4a

Hanna Land Company, LLC Republic No. 1 Surface Mine	VALLEY FILL No. 1 PROFILE & SECTIONS

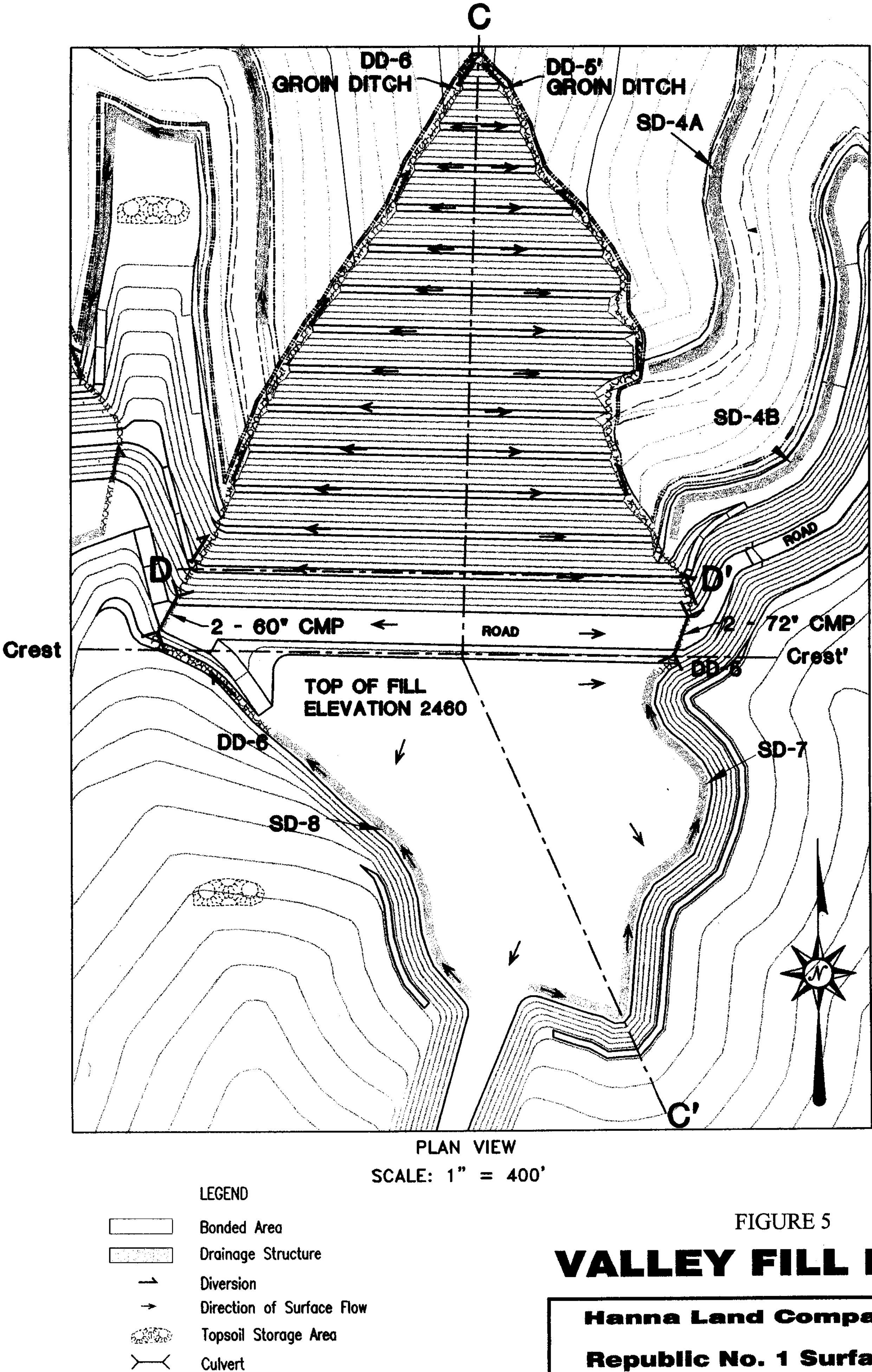


FIGURE 5

VALLEY FILL No. 2

Hanna Land Company, LLC

Republic No. 1 Surface Mine

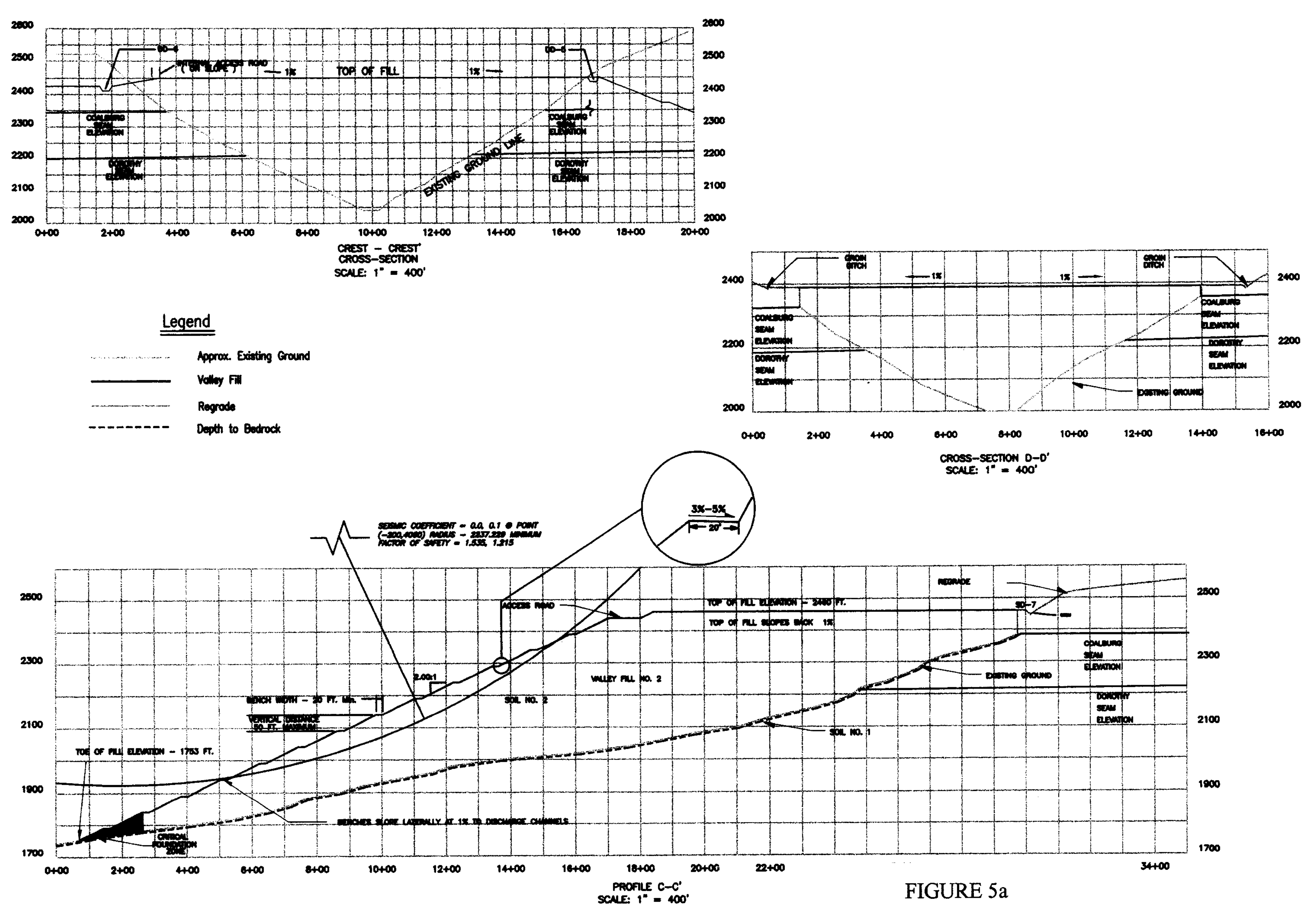
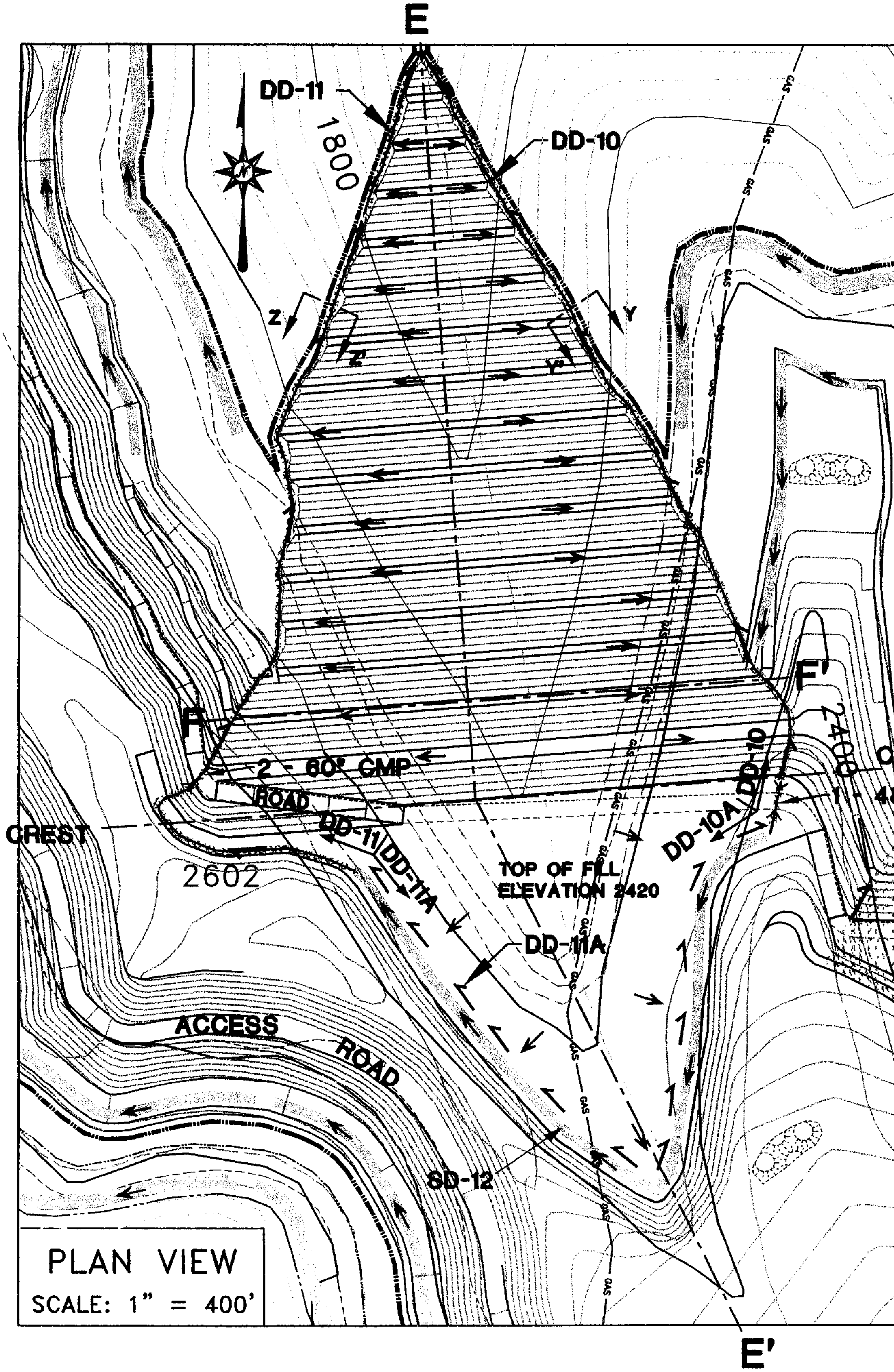


FIGURE 5a

Hanna Land Company, LLC

Republic No. 1 Surface Mine

VALLEY FILL No. 2
PROFILE & SECTIONS



LEGEND

Bonded Area

Drainage Structure

Diversion

Direction of Surface Flow

Topsoil Storage Area

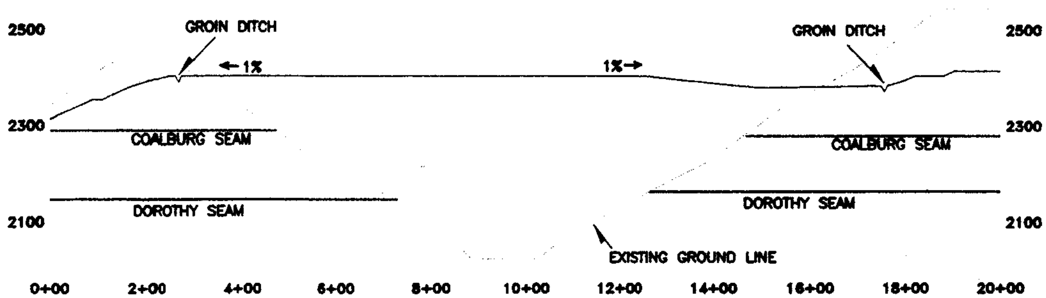
Culvert

FIGURE 6

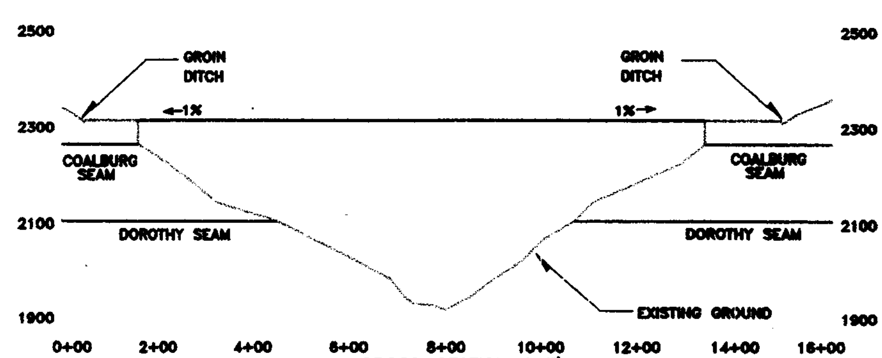
VALLEY FILL No. 3

Hanna Land Company, LLC

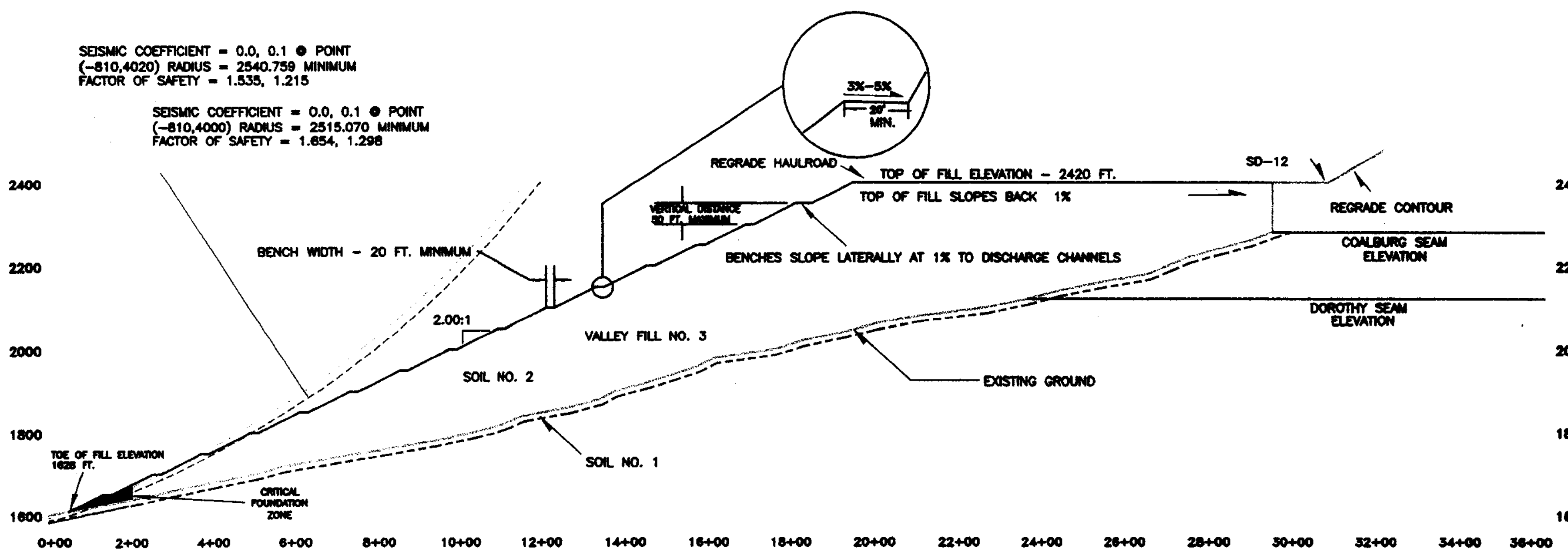
Republic No. 1 Surface Mine



CROSS-SECTION: CREST – CREST'
SCALE: 1" = 400'



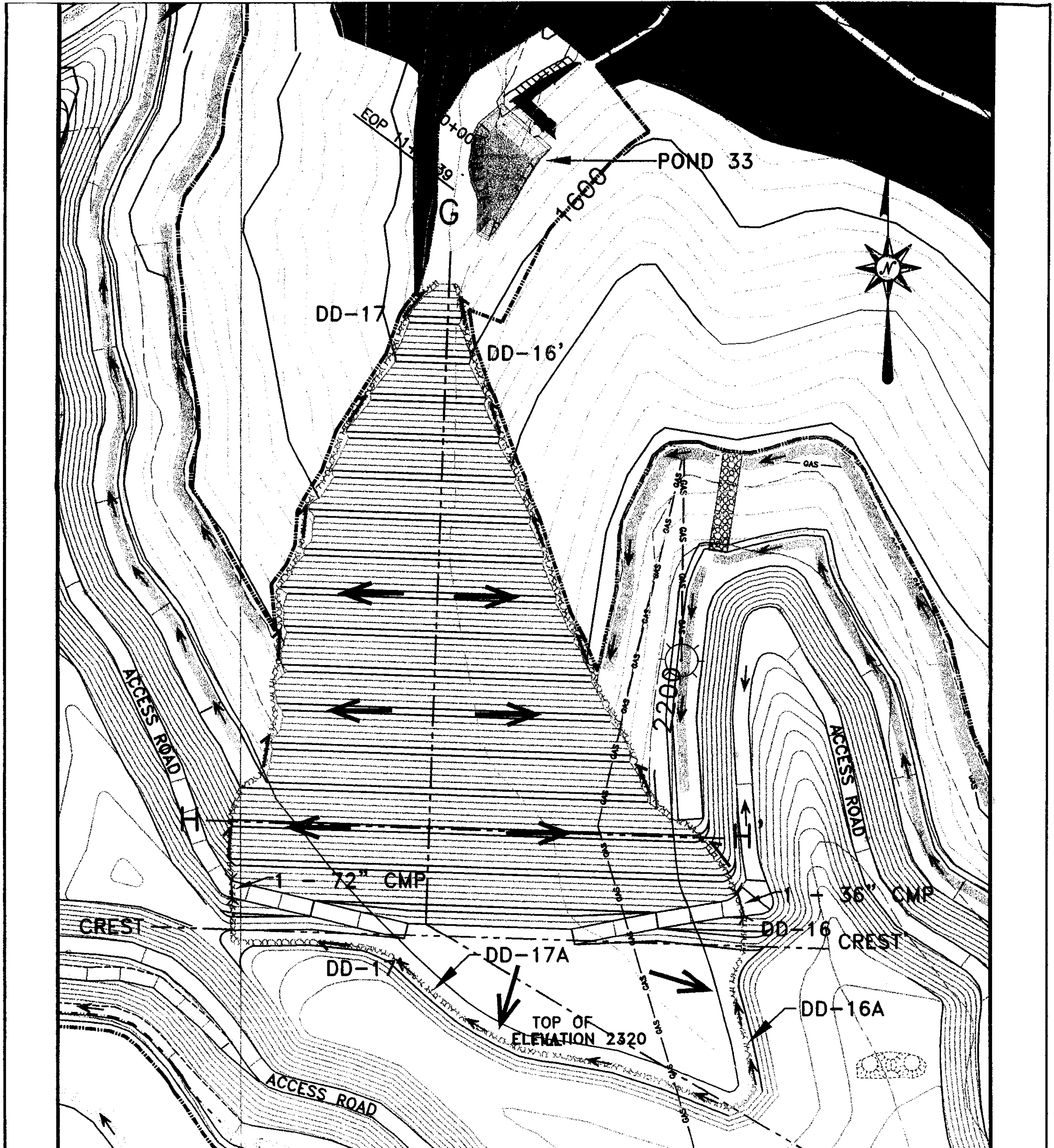
CROSS-SECTION F–F'
SCALE: 1" = 400'



PROFILE E–E'
VALLEY FILL NO. 3
SCALE: 1" = 400'

FIGURE 6a

Hanna Land Company, LLC	VALLEY FILL No. 3
Republic No. 1 Surface Mine	PROFILE & SECTIONS



LEGEND

- Bonded Area
- Drainage Structure
- Diversion
- Direction of Surface Flow
- Topsoil Storage Area
- Culvert

FIGURE 7

PLAN VIEW

SCALE: 1" = 400'

VALLEY FILL No. 4

Hanna Land Company, LLC

Republic No. 1 Surface Mine

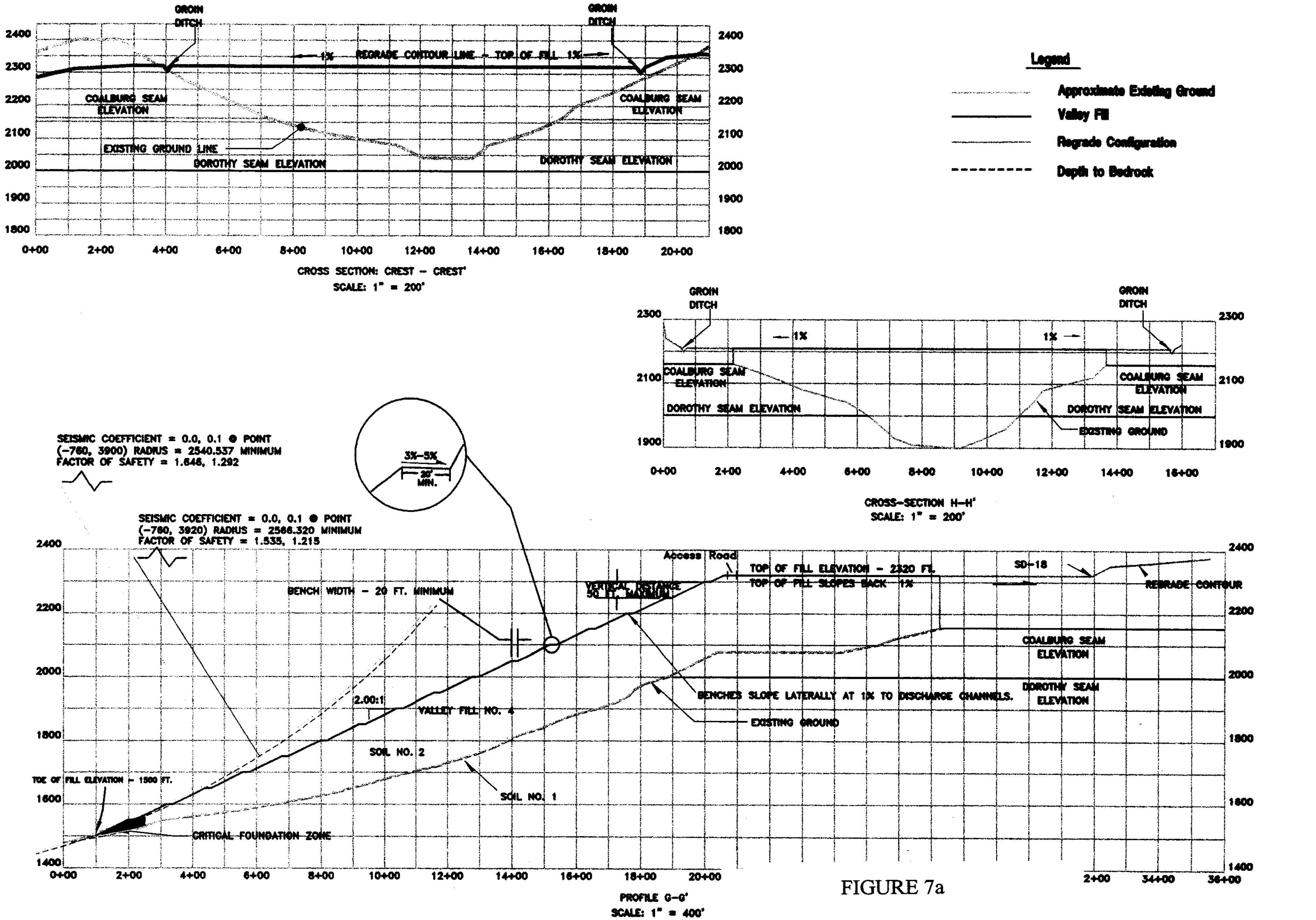


FIGURE 7a

Hanna Land Company, LLC

Republic No. 1 Surface Mine

VALLEY FILL No. 4 PROFILE & SECTIONS

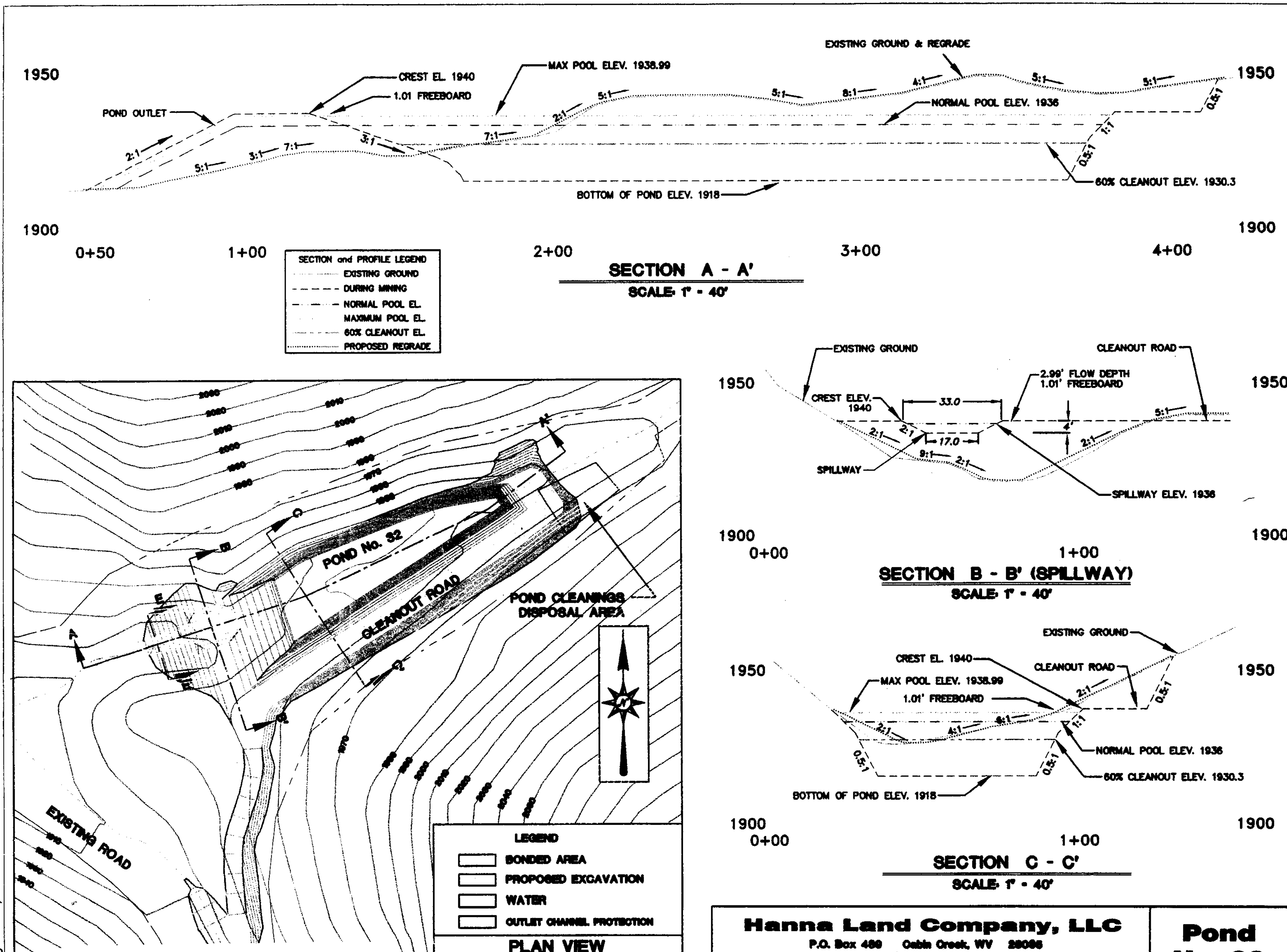
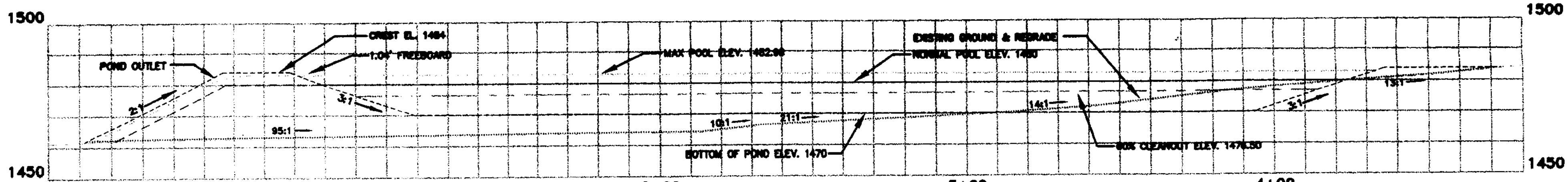
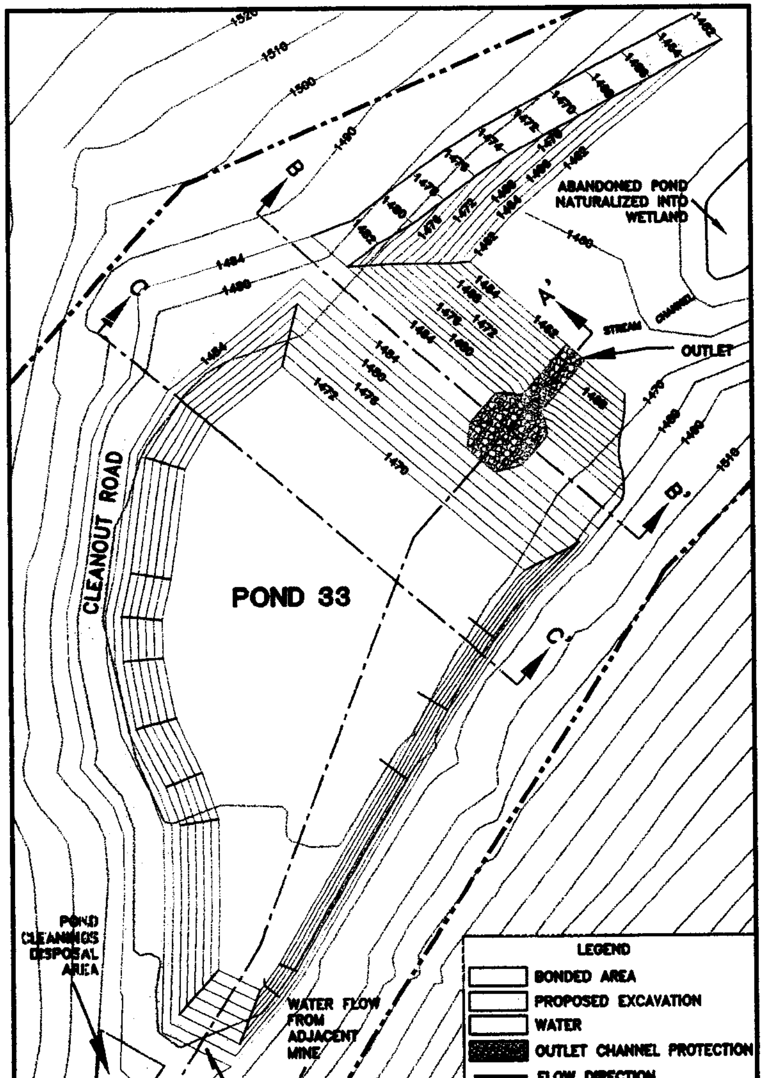

SECTION A - A'
SCALE: 1" = 40'
EXISTING GROUND & REGRADE
CREST EL. 1940
1.01 FREEBOARD
MAX POOL ELEV. 1938.99
POND OUTLET
NORMAL POOL ELEV. 1936
60% CLEANOUT ELEV. 1930.3
BOTTOM OF POND ELEV. 1918
1950
1900
0+50
1+00
2+00
3+00
4+00
SECTION and PROFILE LEGEND
EXISTING GROUND
DURING MINING
NORMAL POOL EL.
MAXIMUM POOL EL.
60% CLEANOUT EL.
PROPOSED REGRADE
SECTION B - B' (SPILLWAY)
SCALE: 1" = 40'
EXISTING GROUND
CREST ELEV. 1940
33.0
17.0
2.99' FLOW DEPTH
1.01' FREEBOARD
CLEANOUT ROAD
SPILLWAY
SPILLWAY ELEV. 1936
0+00
1+00
SECTION C - C'
SCALE: 1" = 40'
EXISTING GROUND
CREST EL. 1940
CLEANOUT ROAD
MAX POOL ELEV. 1938.99
1.01' FREEBOARD
NORMAL POOL ELEV. 1936
60% CLEANOUT ELEV. 1930.3
BOTTOM OF POND ELEV. 1918
POND No. 32
CLEANOUT ROAD
POND CLEANINGS DISPOSAL AREA
EXISTING ROAD
LEGEND
BONDED AREA
PROPOSED EXCAVATION
WATER
OUTLET CHANNEL PROTECTION
PLAN VIEW
SCALE: 1" = 100'
Hanna Land Company, LLC
P.O. Box 489 Cabin Creek, WV 25035
Republic No. 1 Surface Mine
Pond No. 32

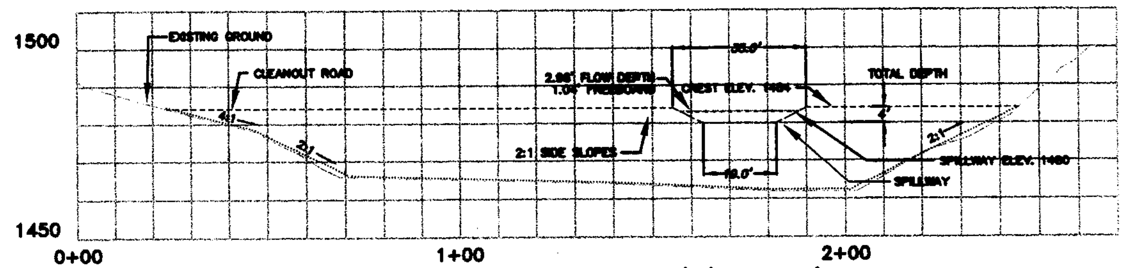
FIGURE 8



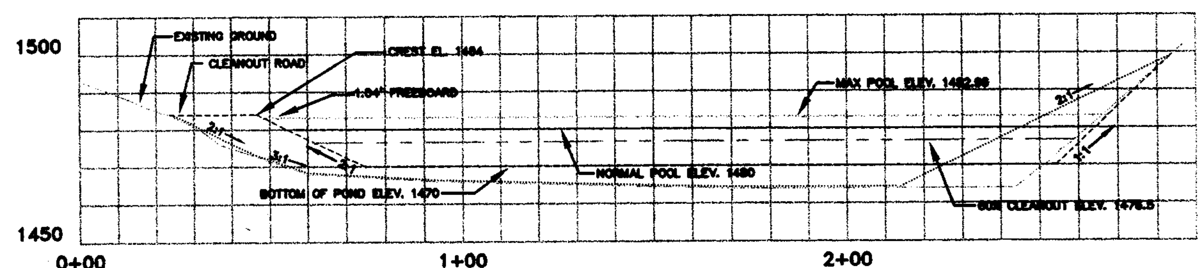
SECTION A – A'
SCALE: 1" = 50'



PLAN VIEW
SCALE: 1' = 100'



SECTION B – B' (SPILLWAY)
SCALE: 1" = 50'



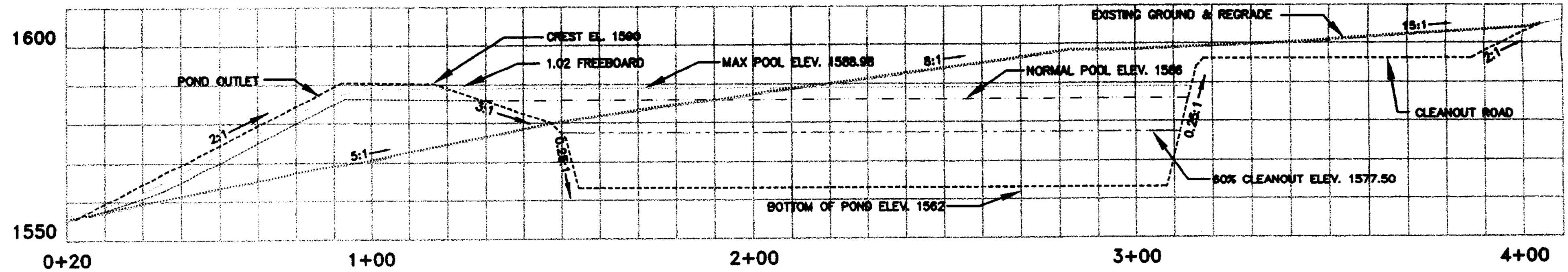
SECTION C – C'
SCALE: 1" = 50'

SECTION and PROFILE LEGEND
- EXISTING GROUND
- DURING MINING
- NORMAL POOL EL.
- MAXIMUM POOL EL.
- 80% CLEANOUT EL.
- 2:1 PROPOSED REGRADE

FIGURE 9

Hanna Land Company, LLC
P.O. Box 480 Cabin Creek, WV 25035
Republic No. 1 Surface Mine

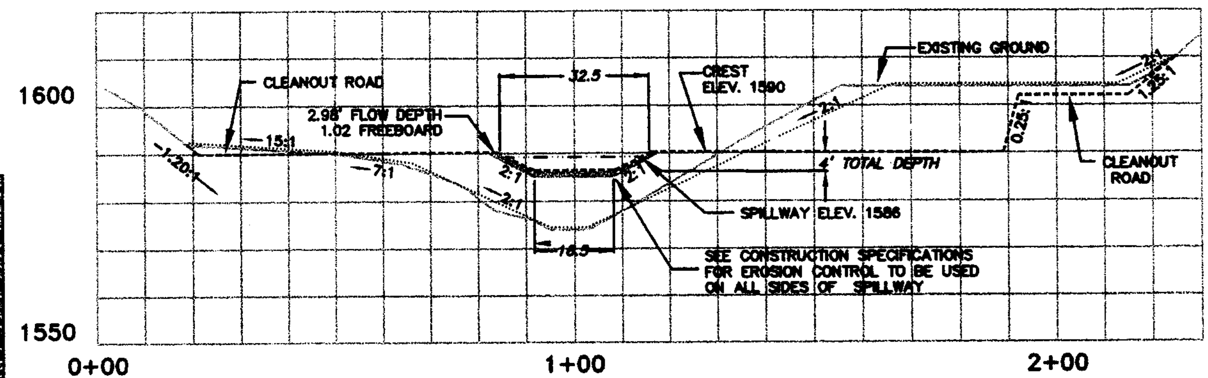
Pond No. 33



SECTION A - A'

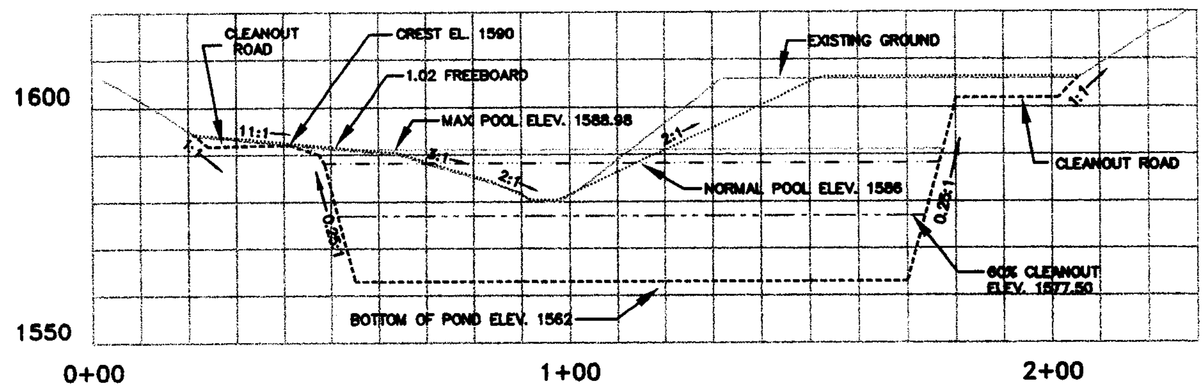
SCALE: 1" = 40'

SECTION and PROFILE LEGEND
- EXISTING GROUND
- DURING MINING
- NORMAL POOL EL.
- MAXIMUM POOL EL.
- 60% CLEANOUT EL.
- PROPOSED REGRADE



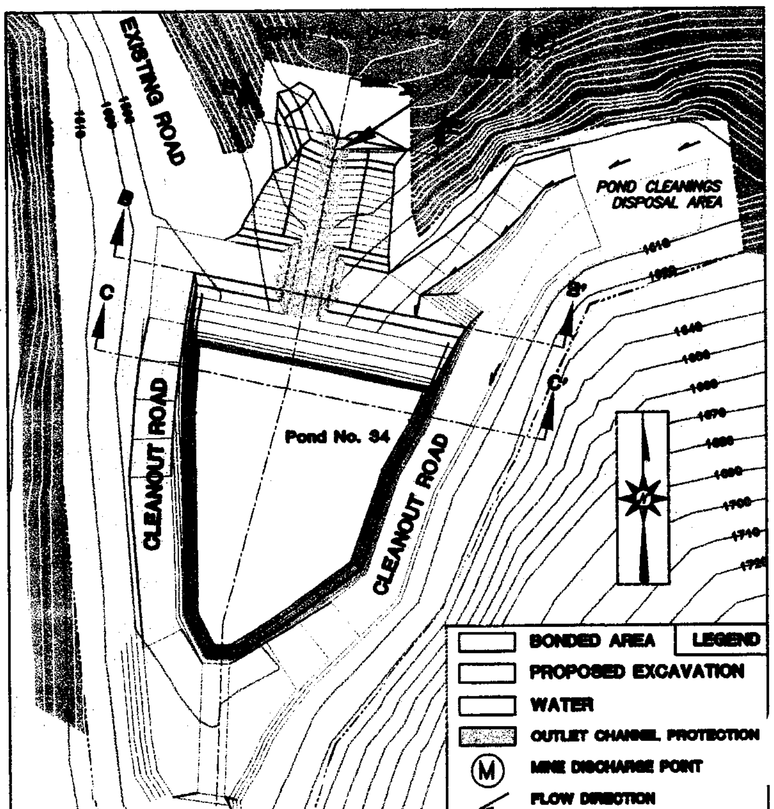
SECTION B - B' (SPILLWAY)

SCALE: 1" = 40'



SECTION C - C'

SCALE: 1" = 40'



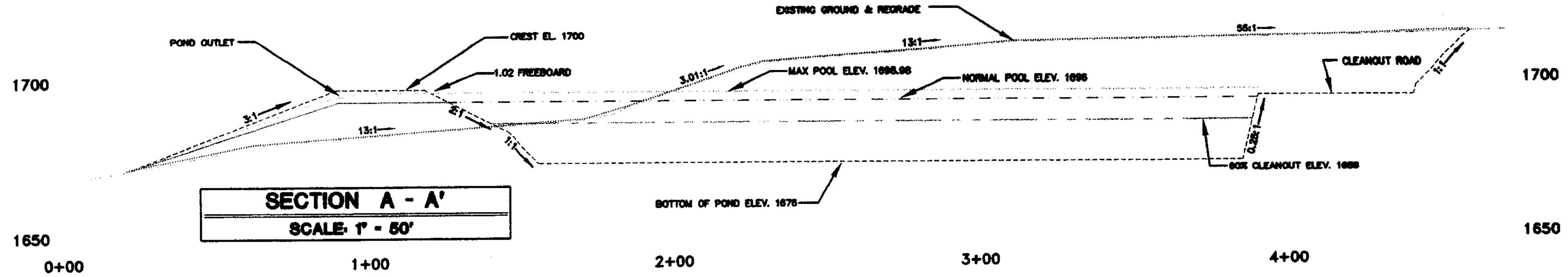
PLAN VIEW

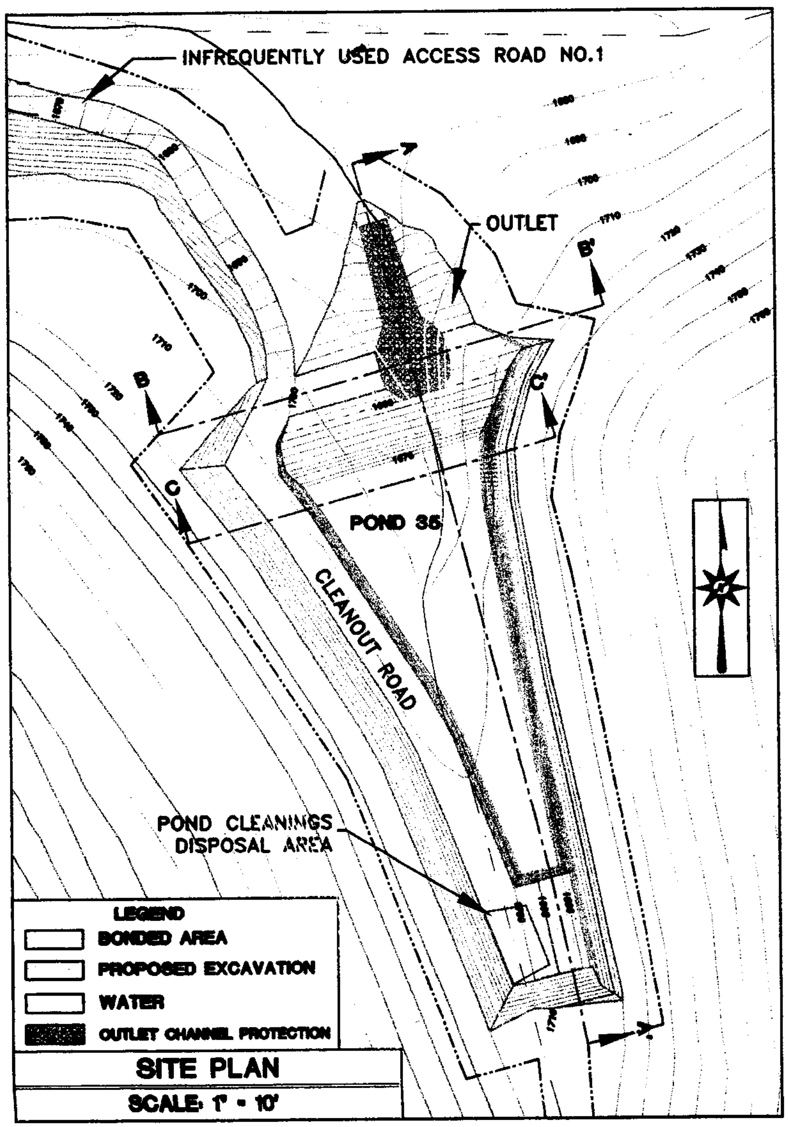
SCALE: 1" = 100'

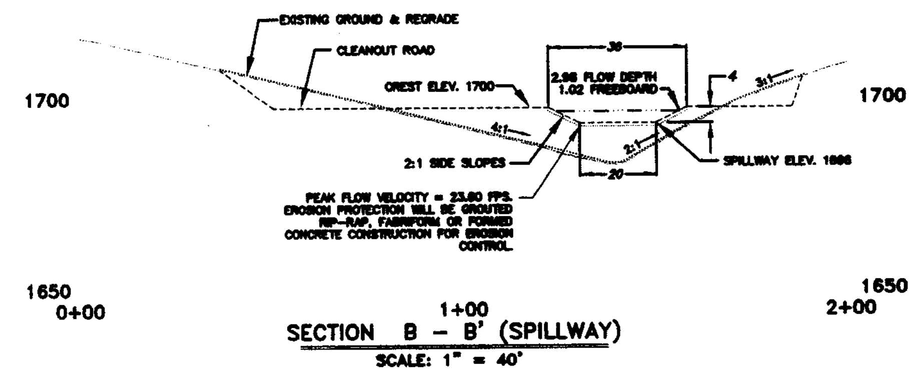
FIGURE 10

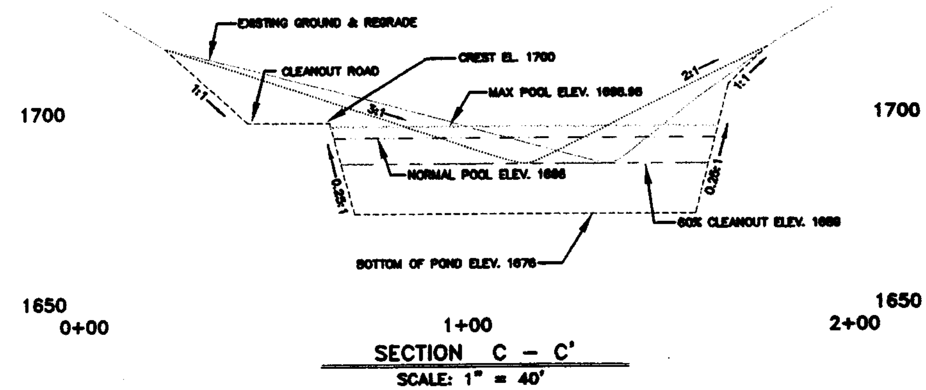
Hanna Land Company, LLC
P.O. Box 460 Cabin Creek, WV 25035
Republic No. 1 Surface Mine

Pond No. 34









SECTION and PROFILE LEGEND
- EXISTING GROUND
- DURING MINING
- NORMAL POOL EL.
- MAXIMUM POOL EL.
- 60% CLEANOUT EL.
- PROPOSED REGRADE

FIGURE 11

Hanna Land Company, LLC
P.O. Box 489 Cabin Creek, WV 25035
Republic No. 1 Surface Mine

Pond No. 35

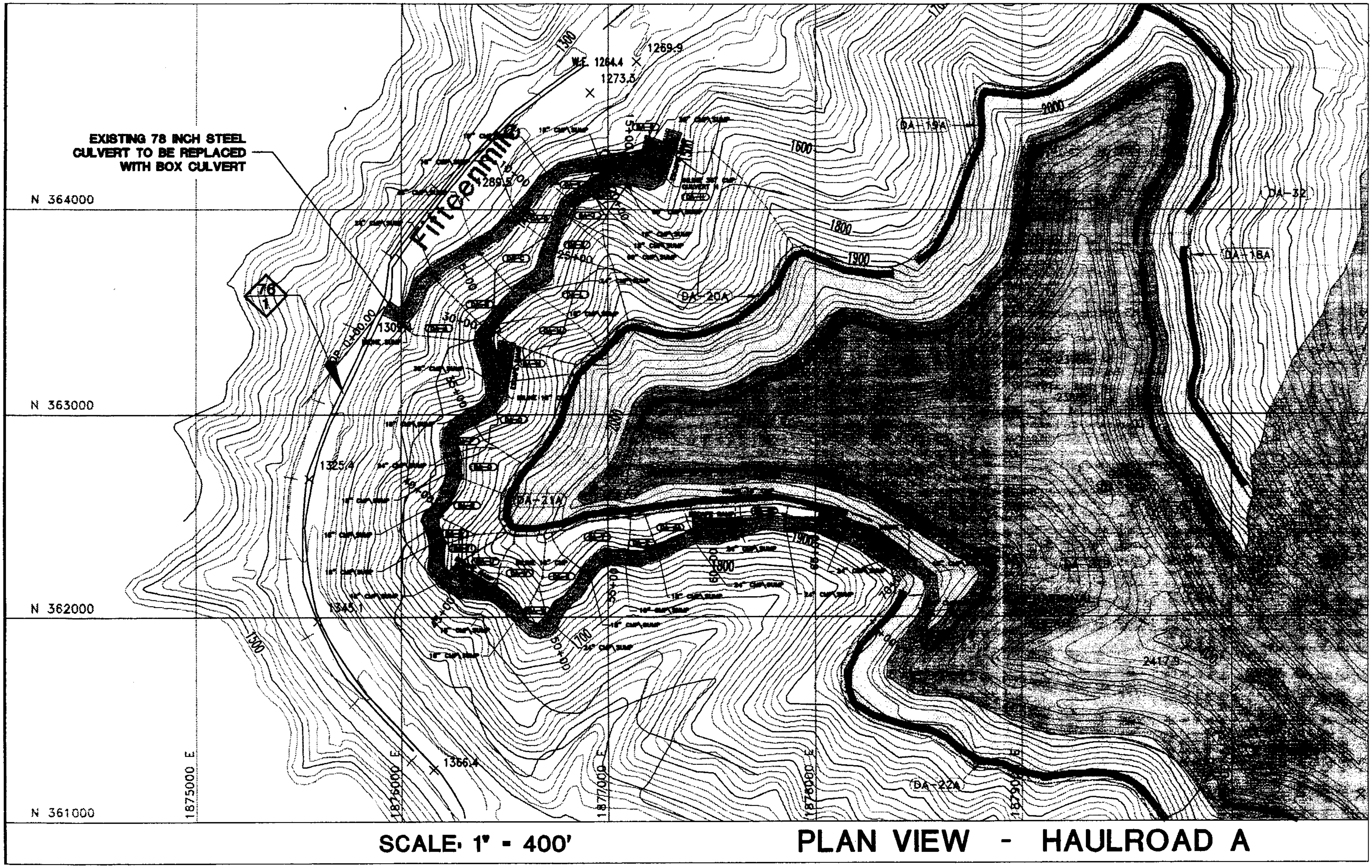
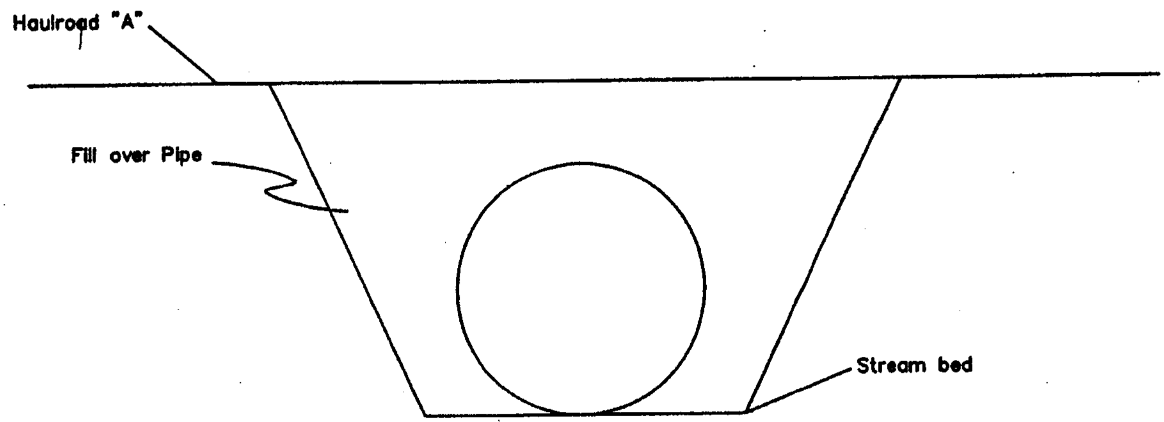

EXISTING 78 INCH STEEL
CULVERT TO BE REPLACED
WITH BOX CULVERT
Fifteenmile
N 364000
N 363000
N 362000
N 361000
1875000 E
1876000 E
1877000 E
1878000 E
DA-19A
DA-18A
DA-32
DA-20A
DA-21A
DA-22A
1269.9
1273.5
1289.5
1325.4
1345.1
1366.4
2417.9
SCALE: 1" - 400'
PLAN VIEW - HAULROAD A

FIGURE 12

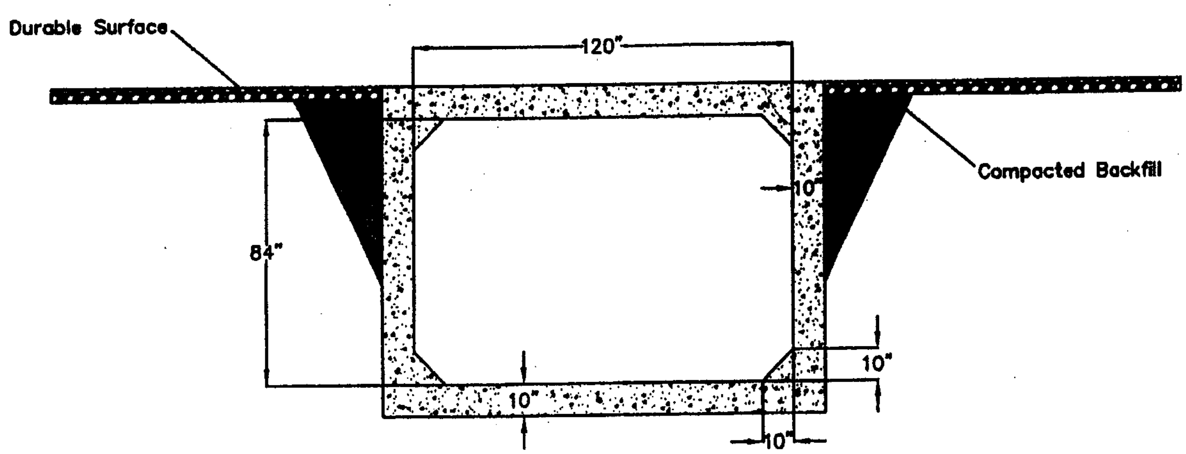
Hanna Land Company, L.L.C.
Repbulic No. 1 Surface Mine

Typical Replacement Crossing at Fifteenmile Fork Haulroad "A"

Not to Scale



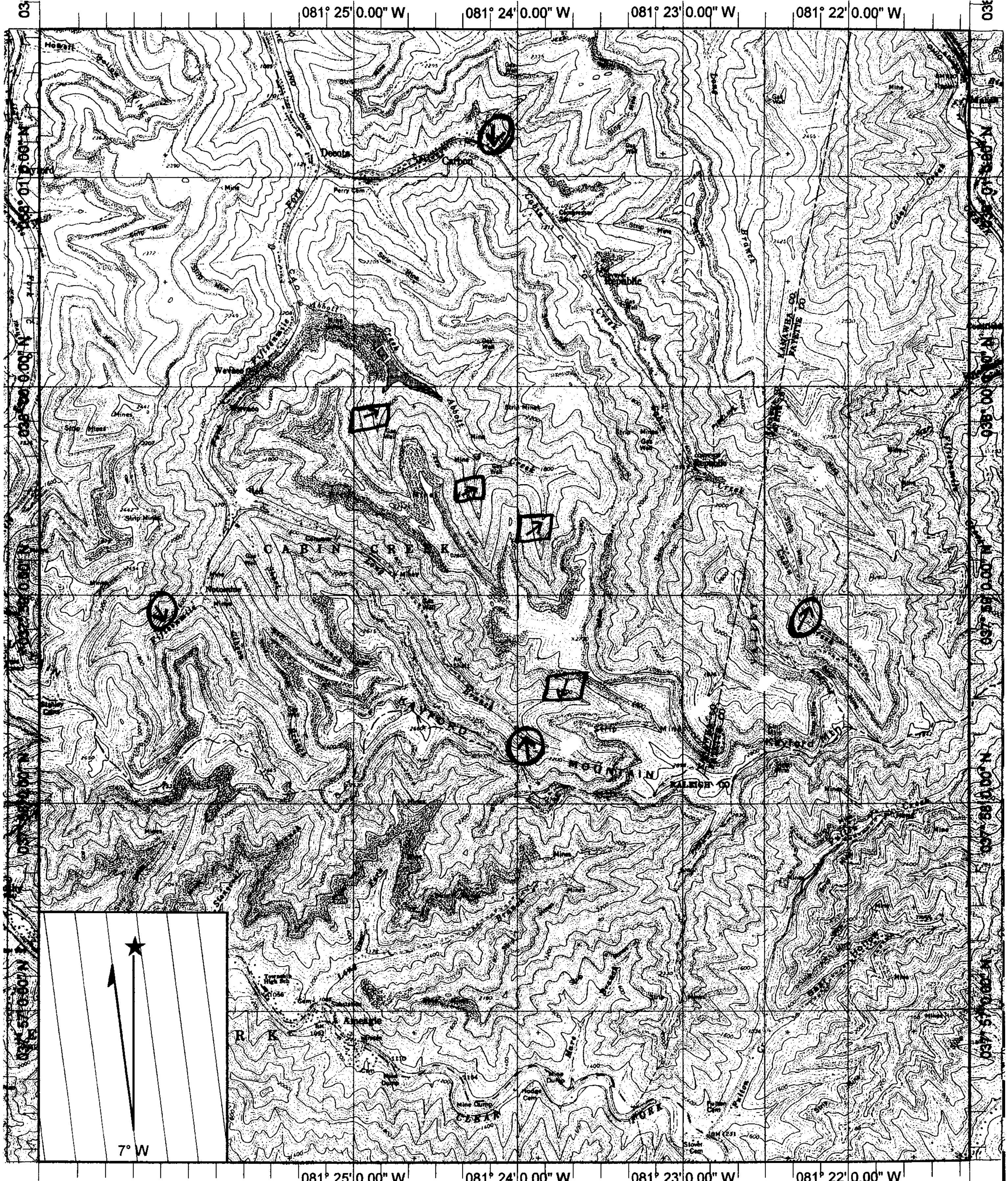
Typical Cross Section
Existing 78" Steel Culvert



Typical Cross Section
Concrete Box Culvert Replacement Crossing

NOTES: This typical design to be used for replacement of the existing 78" steel pipe crossing in Haulroad "A".

FIGURE 12a



Name: DOROTHY
Date: 4/28/2004
Scale: 1 inch equals 3636 feet

Location: 037° 58' 59.5" N 081° 24' 05.1" W

(↗) off-site restoration areas
[↗] impact areas

FIGURE 13
LOCATION MAP
OFF-SITE MITIGATION

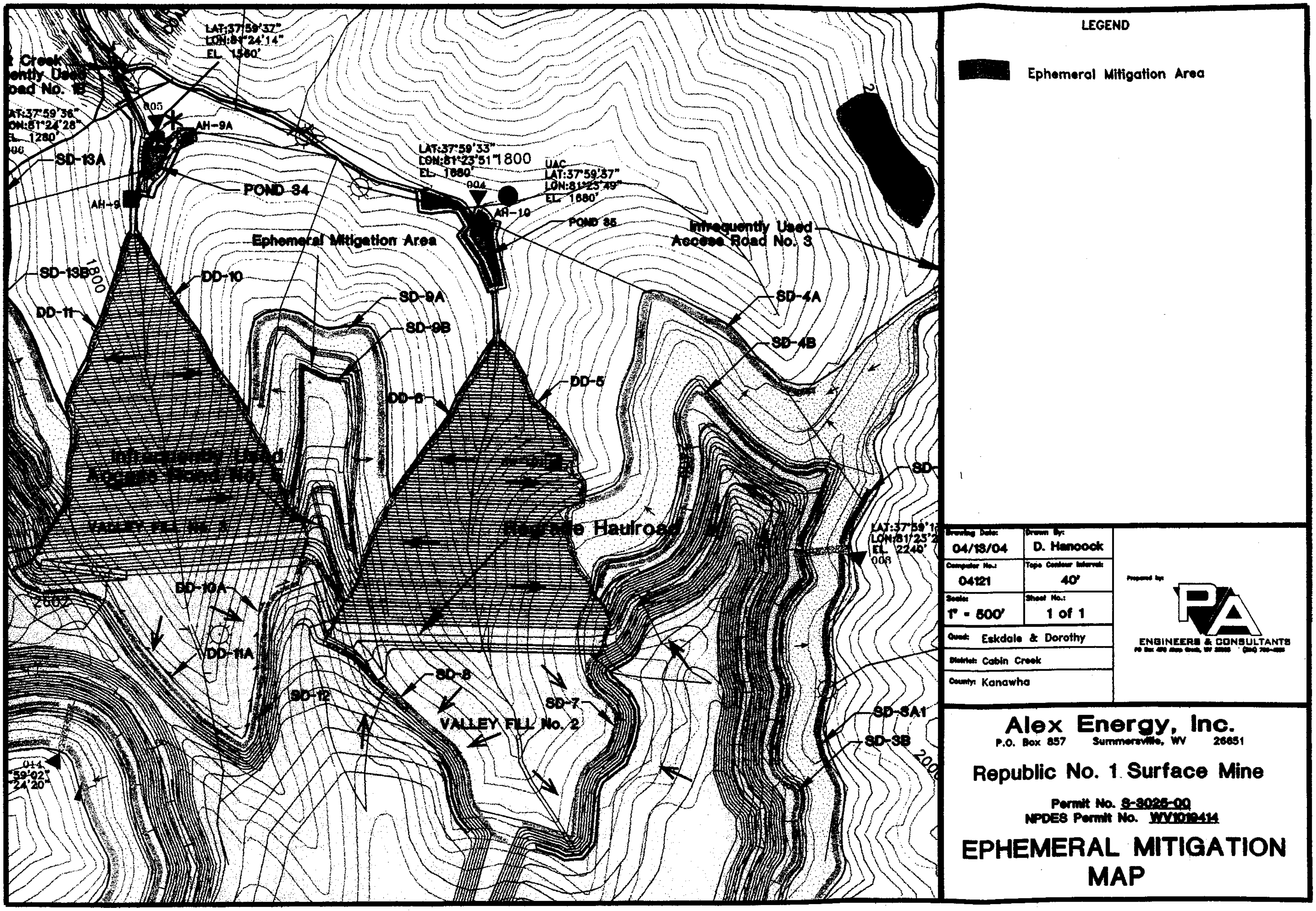
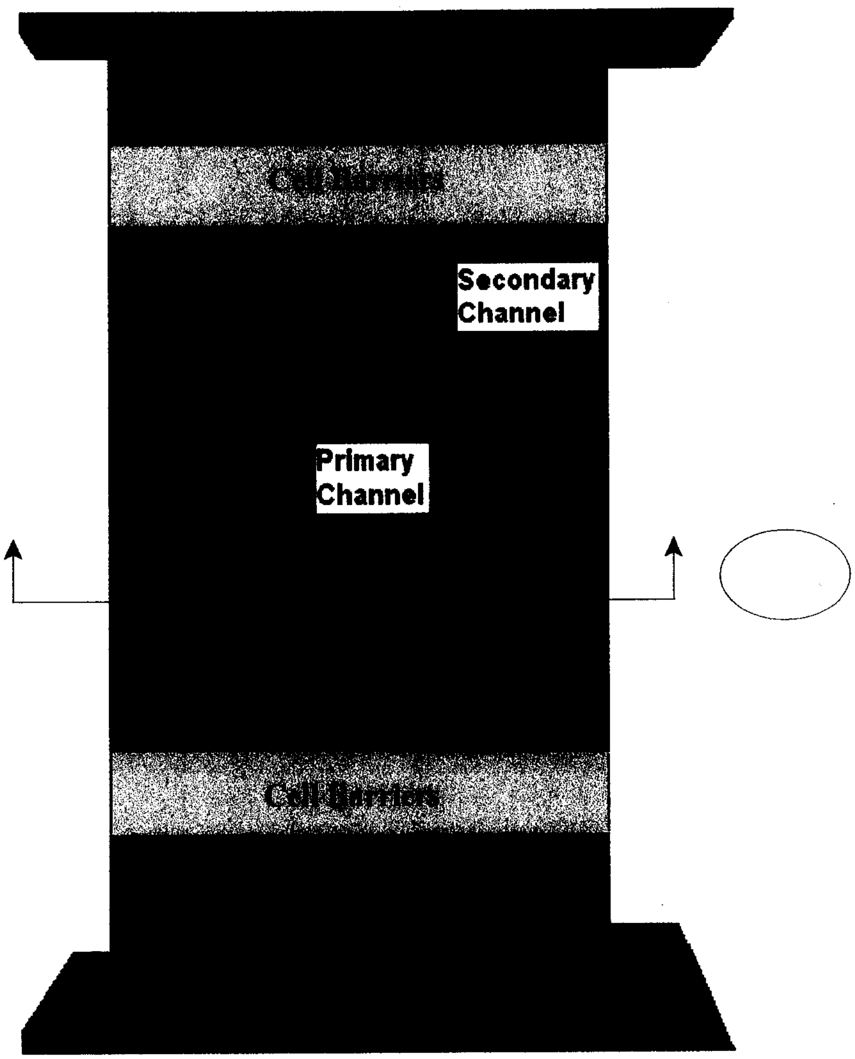
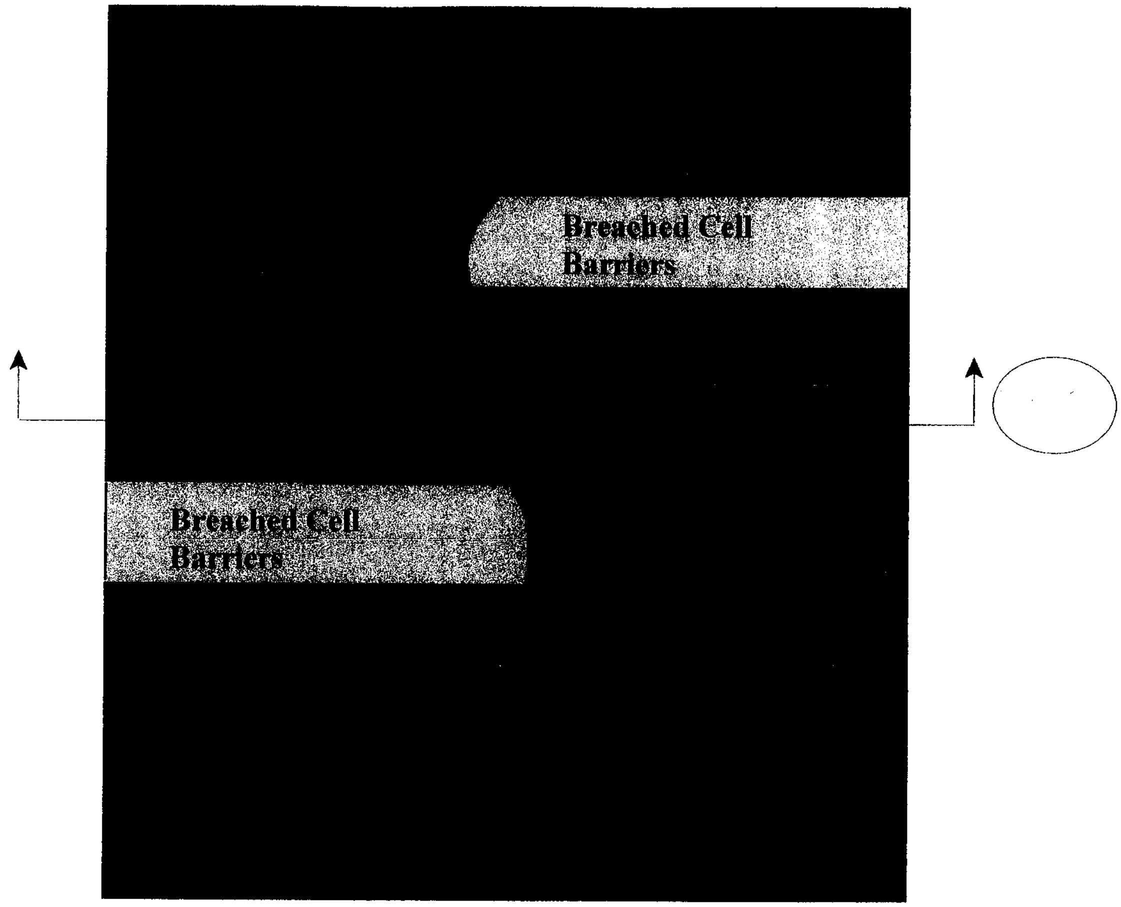


FIGURE 14
ON-SITE MITIGATION FOR
PERMANENT IMPACTS



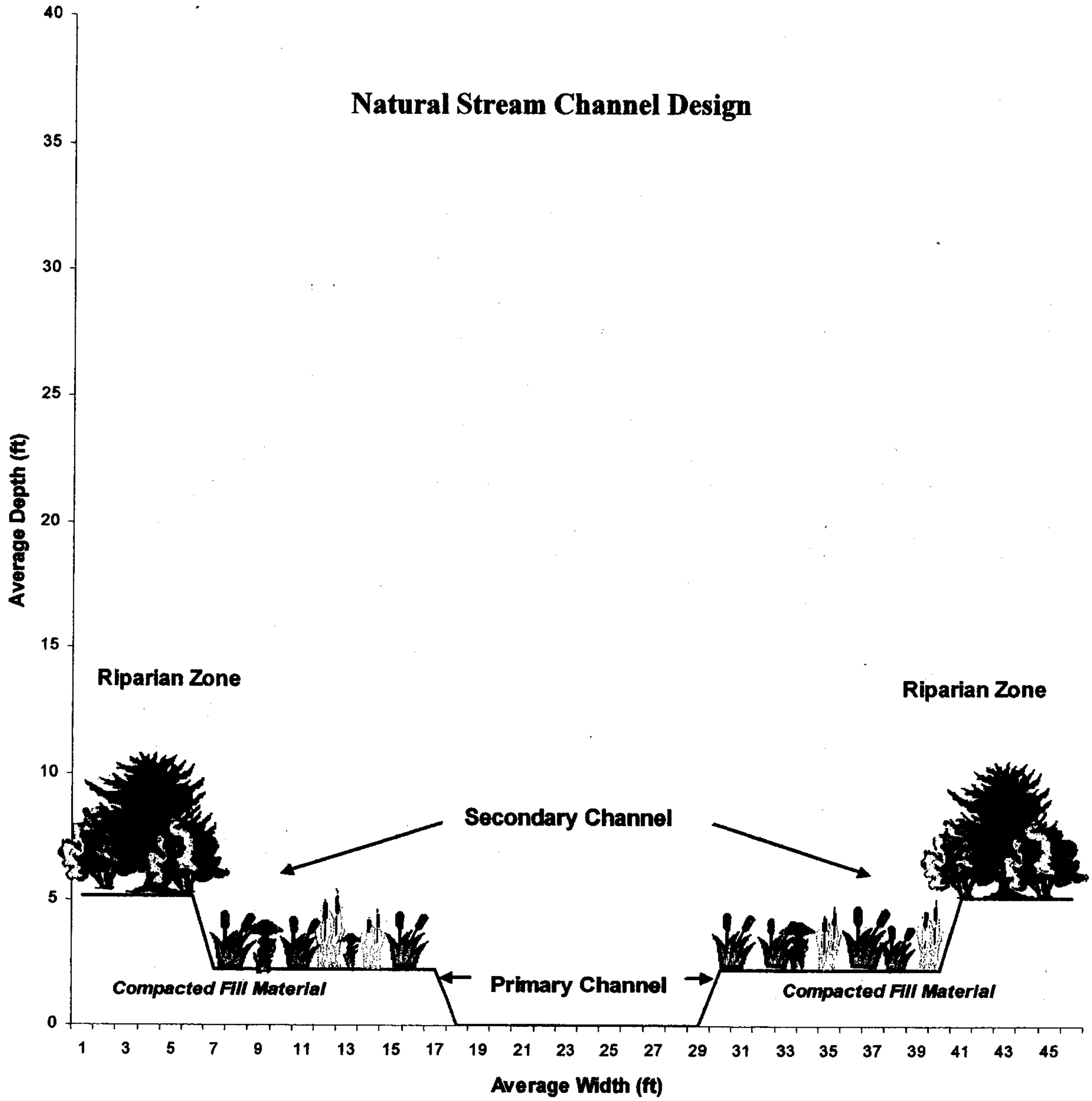
Overhead plan view of a typical SMCRA defined sediment ditch. Alex Energy, Inc., April 2004.

FIGURE 14a



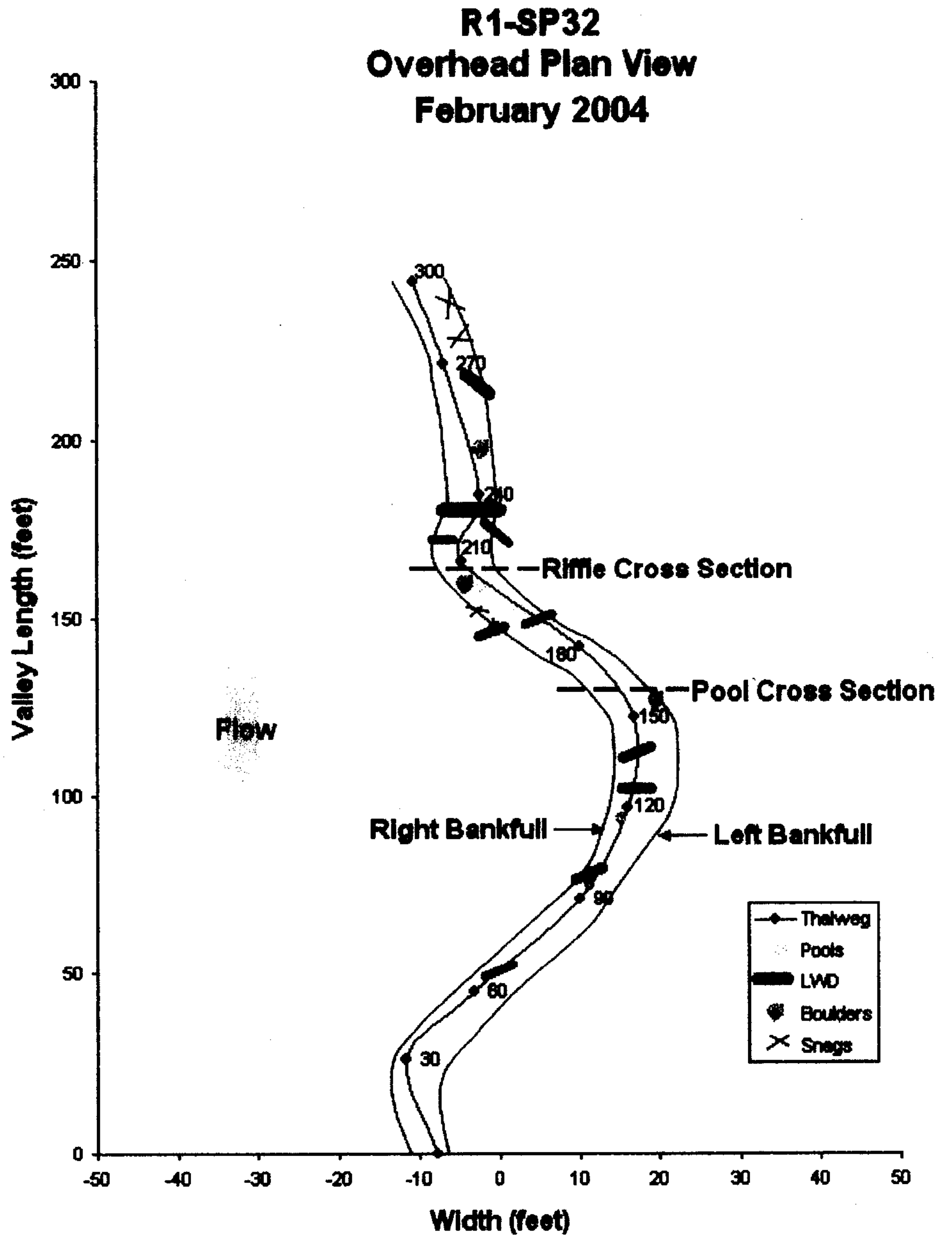
Overhead plan view of a typical SMCRA defined sediment structure converted into a more natural, sinuous, on-bench stream. Alex Energy, Inc., April 2004.

FIGURE 14b



Typical SMCRA defined sediment ditch converted into a more natural, sinuous, on-bench stream channel. Alex Energy, Inc., April 2004.

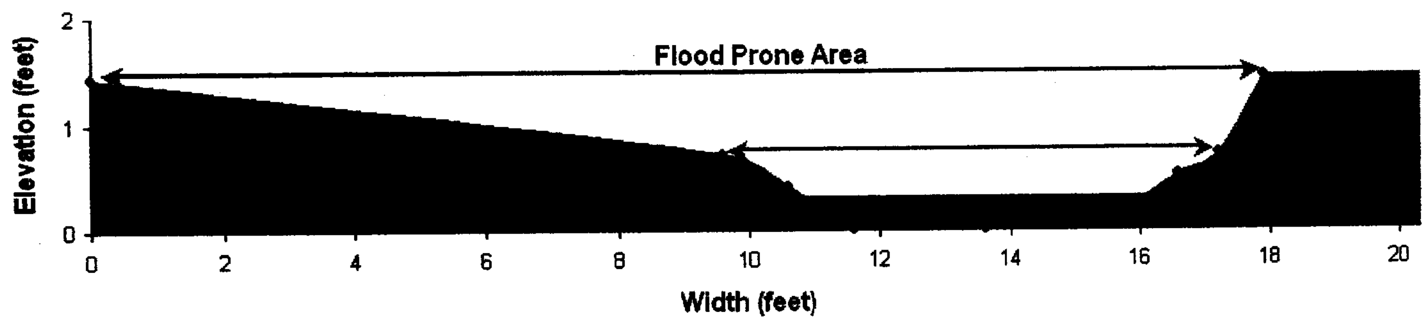
FIGURE 14c



Overhead plan view of the Republic No. 1 - Sediment Pond 32 stream reach. Alex Energy, Inc., March 2004.

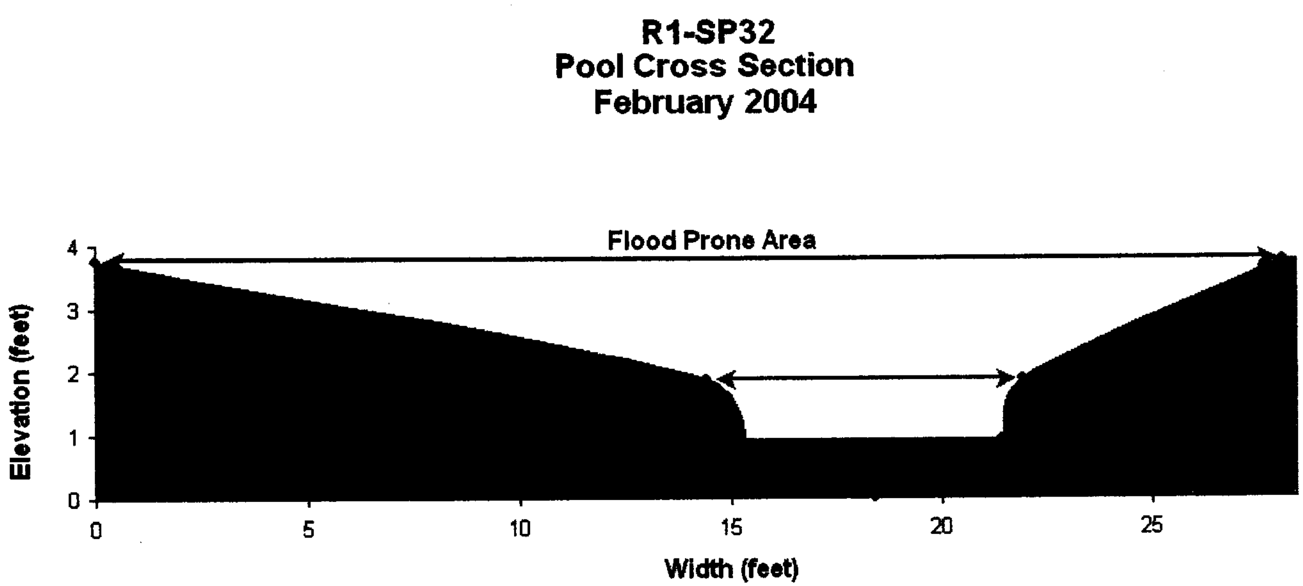
FIGURE 15
ON-SITE MITIGATION FOR
TEMPORARY IMPACTS

R1-SP32
Riffle Cross Section
February 2004



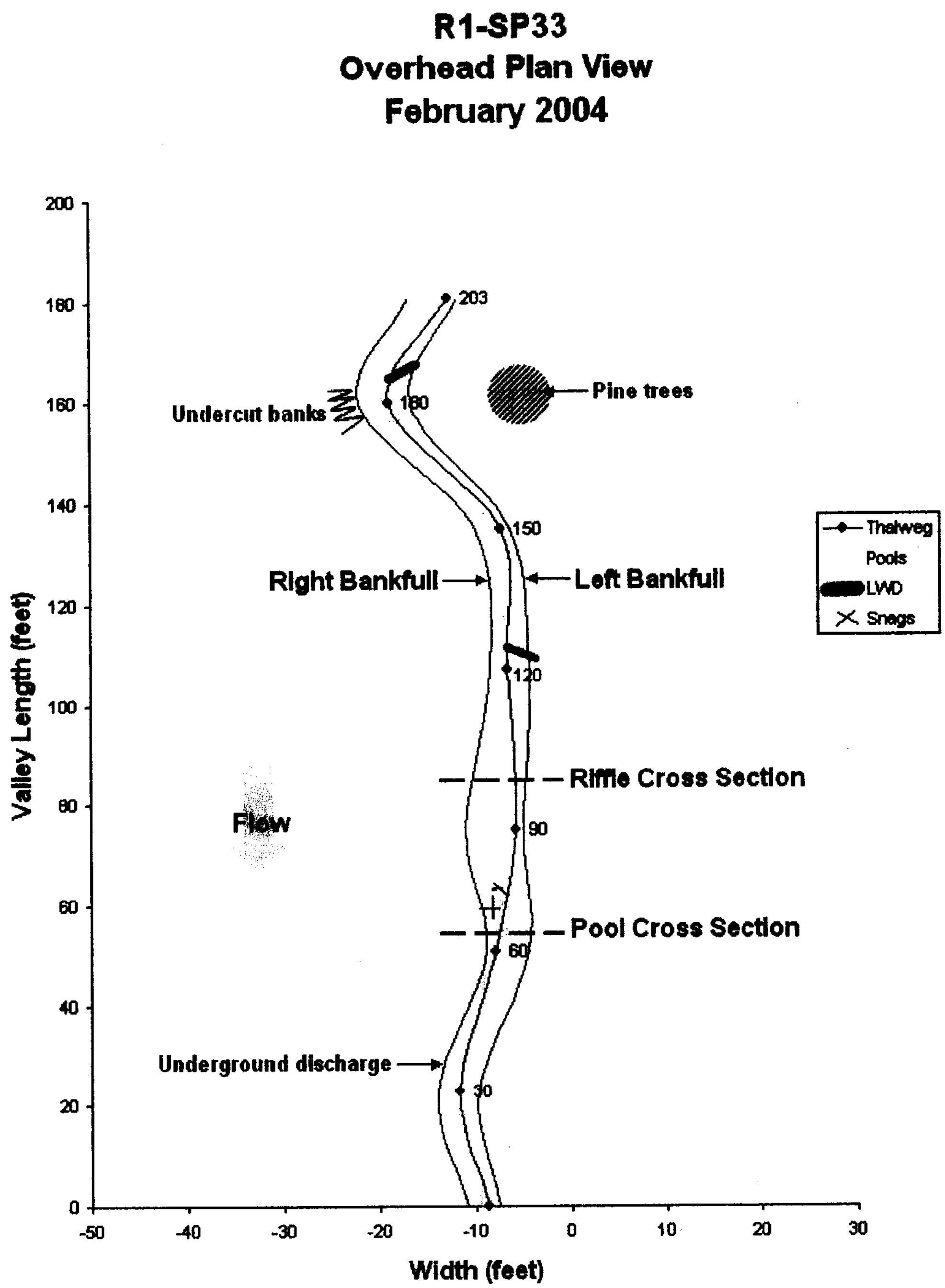
Republic No. 1 - Sediment Pond 32 cross-sectional view of a riffle section. Alex Energy, Inc., March 2004.

FIGURE 15a



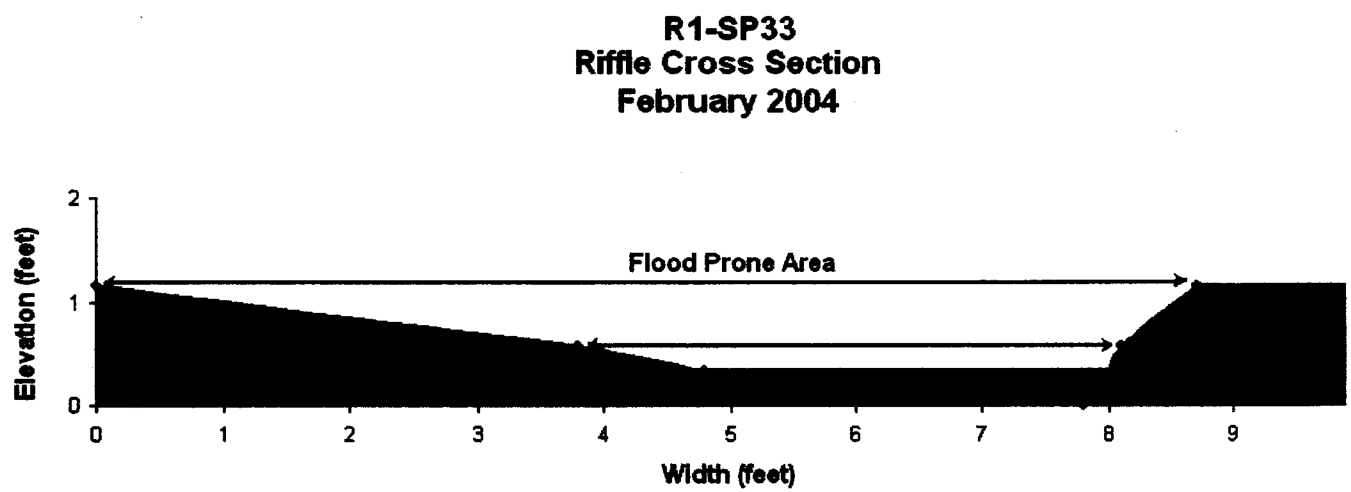
Republic No. 1 - Sediment Pond 32 cross-sectional view of a pool section. Alex Energy, Inc., March 2004.

FIGURE 15b



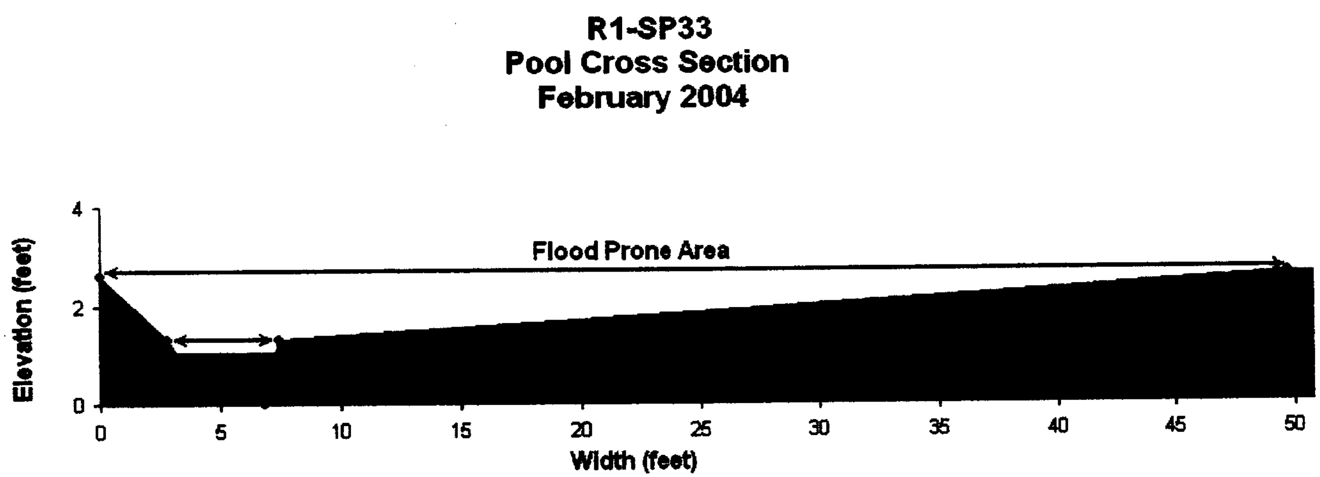
Overhead plan view of the Republic No. 1 - Sediment Pond 33 stream reach. Alex Energy, Inc., March 2004.

FIGURE 15c



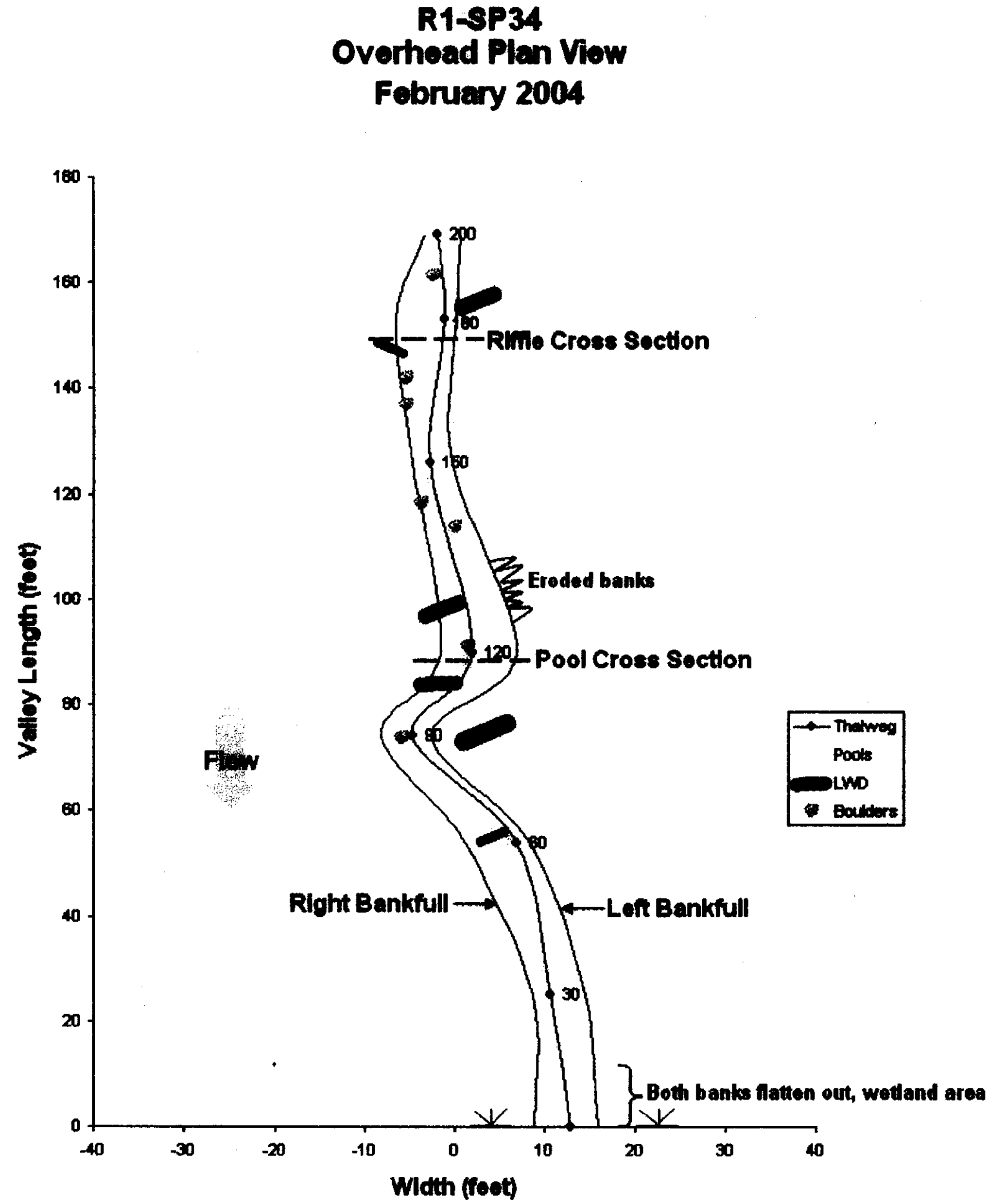
Republic No. 1 - Sediment Pond 33 cross-sectional view of a riffle section. Alex Energy, Inc., March 2004.

FIGURE 15d



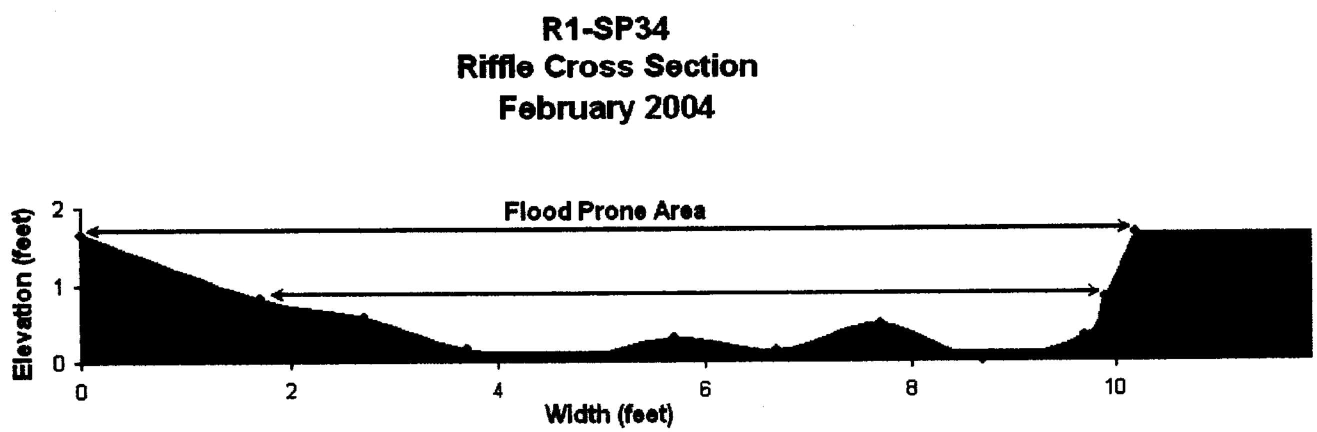
Republic No. 1 - Sediment Pond 33 cross-sectional view of a pool section. Alex Energy, Inc., March 2004.

FIGURE 15e



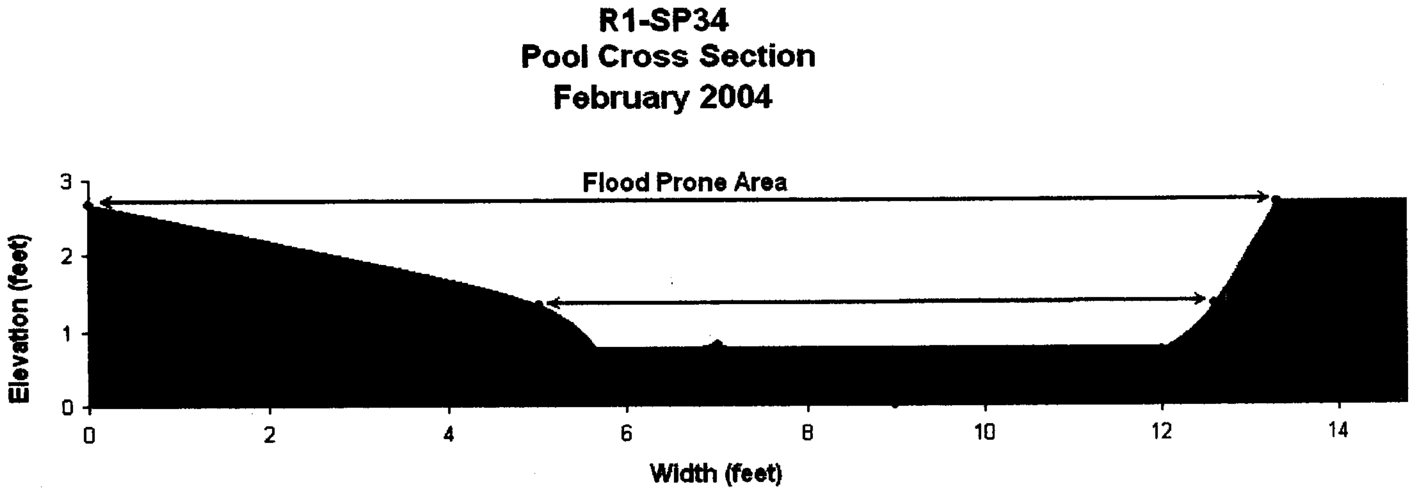
Overhead plan view of the Republic No. 1 - Sediment Pond 34 stream reach. Alex Energy, Inc., March 2004.

FIGURE 15f



Republic No. 1 - Sediment Pond 34 cross-sectional view of a riffle section. Alex Energy, Inc., March 2004.

FIGURE 15g



Republic No. 1 - Sediment Pond 34 cross-sectional view of a pool section. Alex Energy, Inc., March 2004.

FIGURE 15h

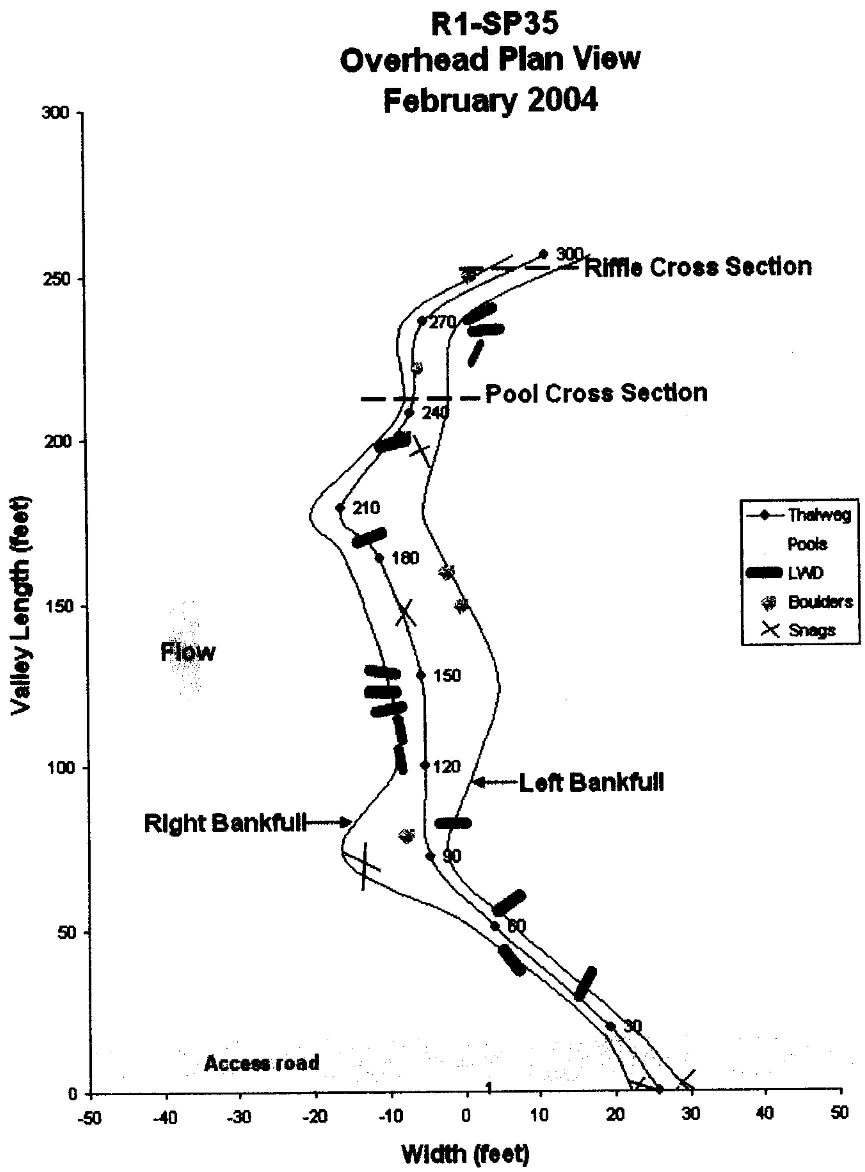
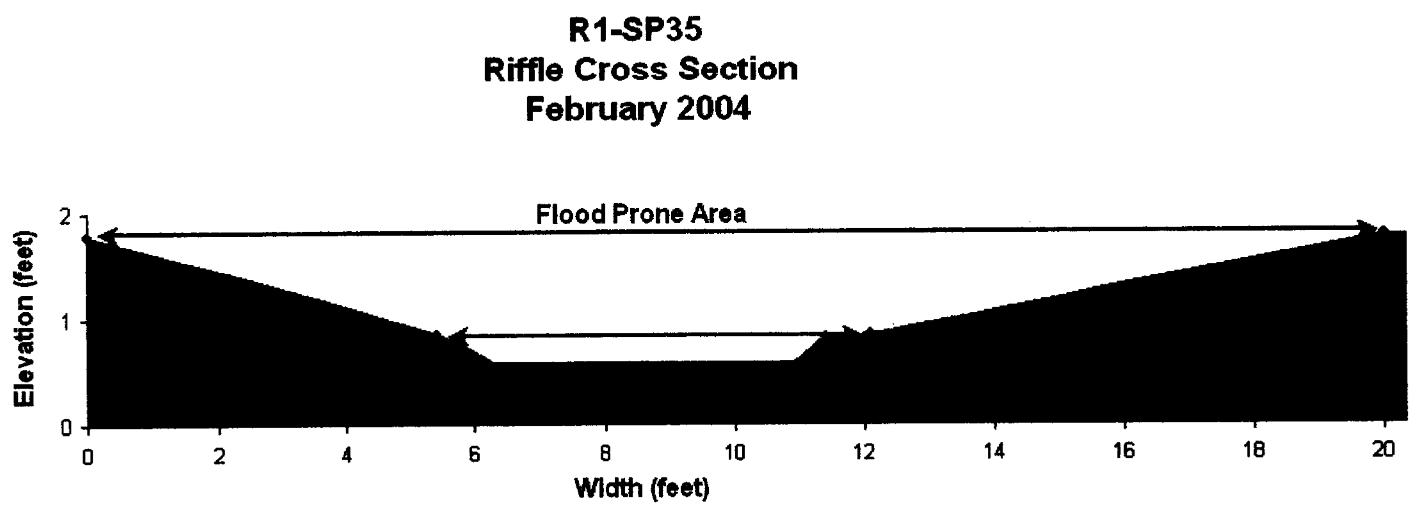
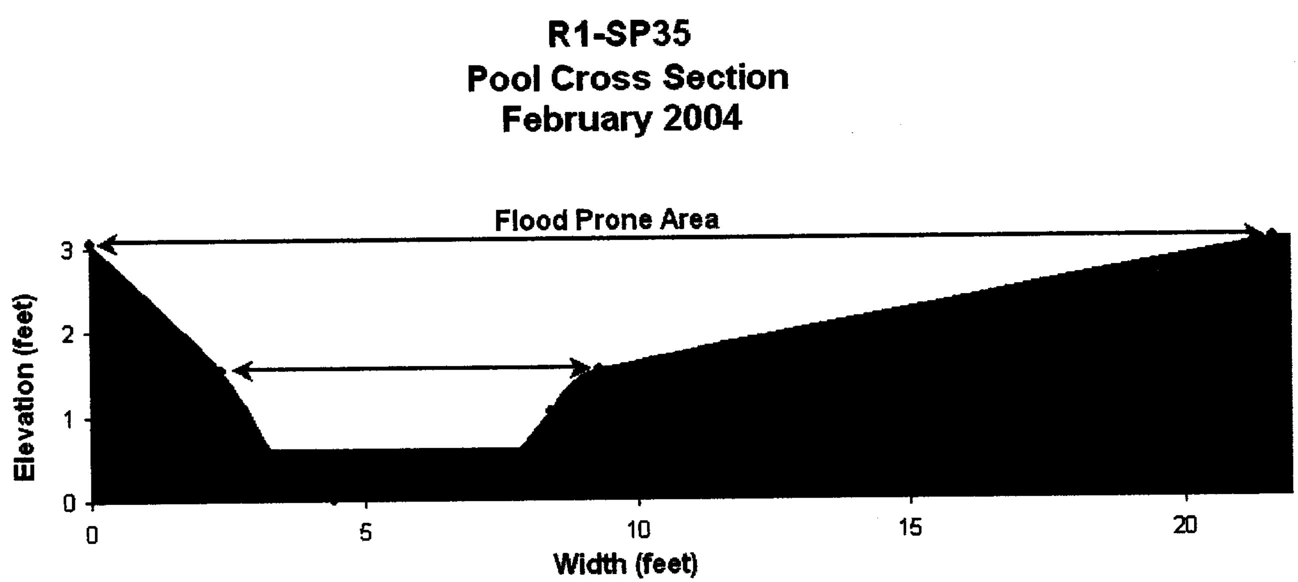


FIGURE 23. Overhead plan view of the Republic No. 1 - Sediment Pond 35 stream reach. Alex Energy, Inc., March 2004.



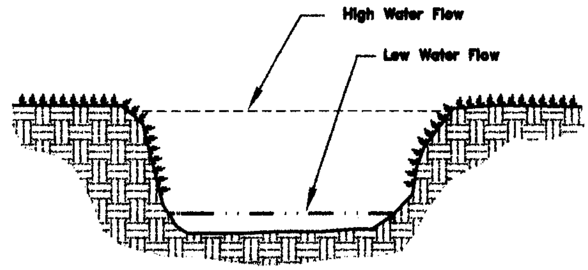
Republic No. 1 - Sediment Pond 35 cross-sectional view of a riffle section. Alex Energy, Inc., March 2004.

FIGURE 15j

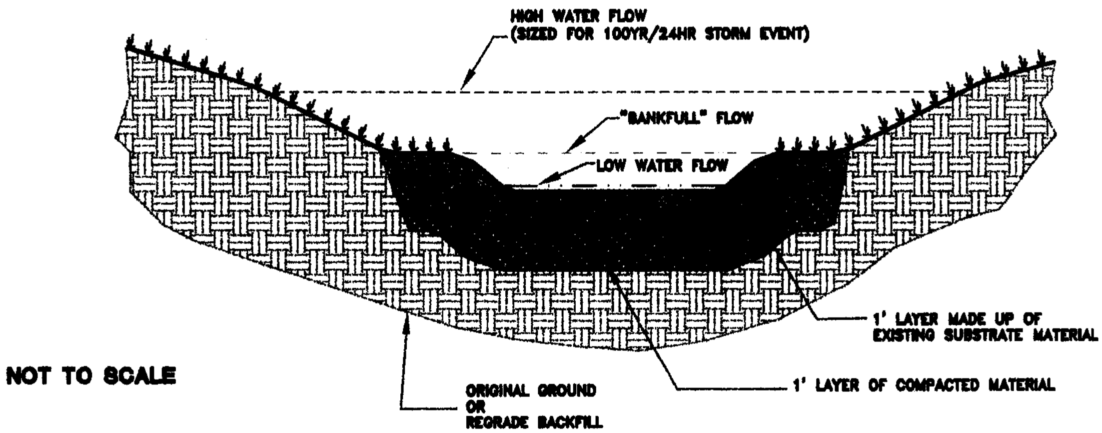


. Republic No. 1 - Sediment Pond 35 cross-sectional view of a pool section. Alex Energy, Inc., March 2004.

FIGURE 15k



EXISTING STREAM CHANNEL



NOT TO SCALE

PERMANENT RELOCATED STREAM CHANNEL 'CHANNEL WITHIN A CHANNEL' DESIGN

CONSTRUCTION SPECIFICATIONS FOR STREAM CHANNEL ALTERATION

Site Preparation:
The existing stream channel will be surveyed with regard to dimension, pattern and profile and the records of this survey will be maintained for use as reference in the relocation and restoration process. Prior to the construction of the relocated channel, obstructions, such as trees, shrubs and boulders, shall be removed, as necessary, to establish suitable line and grade for the relocated stream. In addition to the proposed, during mining, sediment control structures (ponds), temporary drainage control devices will be installed as needed during construction. These temporary devices may consist of any one, or a combination of, the following; silt fencing, straw bales, rock checks, level spreaders and/or sumps.

Excavating and Shaping:
Construction of the relocated channel will begin at the farthest downstream end and progress upstream. Areas of stream channel relocation that extend into the proposed mineral removal area will be compacted and/or lined, to lessen infiltration into the backstack, prior to the shaping of the actual channel. Areas which receive small drainage flow or are located near the base of existing valley fills will be compacted by mechanical means using the equipment on site. Areas receiving larger drainage flows, such as 4th Right Fork of Ballard Fork, Spring Branch and 1st Right Fork of Spring Branch will be lined with a one foot thick compacted layer of clay soil beneath the reconstructed channel (see attached section drawing). Abundant clay soil material is present in the overburden located above the coal seam. This material will be separated and stored on site for use during stream channel reconstruction.

The last step of the construction will be to divert the existing flow into the reconstructed channel.The completed channel shall conform to the line, grade, and cross section of the existing streambed as determined from the pre-construction survey. By using the dimensional data of the existing stream as a model for the relocated stream, the relocated stream will essentially retain its original shape and profile and merely be 'shifted' laterally on the valley floor.
The reconstructed channel profile shall be generally free draining, with low spots kept to a minimum. All portions of the completed construction area are to be finished and smoothed as needed for the establishment of vegetative cover. See the attached cross sections and profiles of the existing and proposed channels for additional details.

Protection Against Erosion:
The completed relocated channel shall be seeded and mulched immediately after construction, as described in the following stream stabilization plan. During construction of the relocated channel (or in areas where the existing streambed is being mined through), normal stream flow will be diverted though a 24" corrugated plastic pipe. The bypass pipe will be extended downstream, around the construction/mining area. The proposed temporary stream bypass pipe will be anchored on the upstream end with a check dam constructed of sand bags and sheet plastic (see 'Stream Relocation Construction Sequence' drawing). The check dam will insure that all stream flow is directed to the temporary culvert bypass. Should any leakage occur around the check dam, it is anticipated that this leakage will be minimal and a pump will be maintained on site to divert such leakage away from the construction area and into the temporary culvert bypass. If during construction additional temporary drainage control structures are needed they may consist of any one or combination of the following; silt fencing, straw bales, rock checks, level spreaders and/or sumps.

STREAM ENHANCEMENT

As stated previously, stream channel relocation will be permanent and will take place before mining activities are conducted in those particular areas. It is preferable to relocate the existing channel away from the proposed mining activities and away from any possible future operations. The relocated stream channel will be 'enhanced' in section to a "channel within a channel" type or flow design. After the existing stream channel has been relocated laterally along the valley floor, the area above the 'bankfull' elevation will be raised using excess material from the contour excavation. This "channel within a channel" design will allow for the more frequent storm events (1.1 to 1.8 year return period) to have the ability to maintain the balance between natural channel scour and sediment deposition processes, thereby resulting in a stable, self-cleaning channel. Additional hydraulic capacity required to handle the more severe storm events is provided outside (above) the "bankfull" channel. The existing stream channel will be surveyed with regard to dimension, pattern and profile and the records of this survey will be maintained for use as reference in the relocation and restoration process.

Composition of the relocated stream sections will be based on the average existing substrate listed in the Benthic Survey in this application. This composition consists of 0% bedrock,
10% boulders, 42% cobble, 33% gravel and 5% Sand, 5% Silt and 5% Clay. All of these materials will be abundant and readily available on site as reclamation progresses.

Streambeds along trapezoidal sections that are not in bedrock will be modified and will not be installed so they are level from bank to bank. Instead, the streambed will be sloped toward the outside bank in curves and toward either the right bank or left bank along straight sections as dictated by conditions in the field. During periods of low flow, the modified streambed will prevent stream flow from being evenly and shallowly distributed along the bottom of the stream. Instead, stream flow will be concentrated in the depression created by the modified streambed.

Benthic organism recovery will be monitored for a period of two (2) years beyond the final
reclamation of the operation.

The monitoring program shall adhere to the following minimum requirements:
At lease one (1) benthic collection per year to be collected and analyzed by a certified laboratory.
Benthic will be collected during the spring collection season.
Benthic will be collected at Benthic stations 45, 48, 49, 50 and 54.
Additional monitoring sites or collection periods may be added as necessary.

Prepared by:
PA ENGINEERS & CONSULTANTS

Drawing Date:	Drawn By:
02/25/04	G. Grubbe
Computer No.:	Topo Contour Interval:
Stream	N/A

Massey Energy

Hanna Land Company, LLC
P.O. Box 2814 Charleston, WV 25330

Republic No. 1 Surface Mine
Permit No. S-3025-00
NPDES No. WV1019414

Stream Enhancement Construction Details

FIGURE 151

The Cross-Vane, W-Weir and J-Hook Vane are structures that can be implemented to maintain or enhance river stability and function to facilitate multiple objectives.

Descriptions, design specifications, placement locations, spacing and various applications of Cross-Vane, W-Weir and J-Hook Vane structures are shown here. These structures were developed and should be subsequently applied to: 1) establish grade control, 2) reduce streambank erosion, 3) facilitate sediment transport, 4) provide for irrigation diversion structures, 5) enhance fish habitat, 6) maintain width/depth ratio, 7) improve recreational qualities, 8) maintain river stability, 9) dissipate excess energy, 10) withstand large floods, 11) maintain channel capacity, 12) be compatible with natural channel design, and 13) be visually acceptable to the public.

DESIGN SPECIFICATIONS

Cross-Vanes, W-Weirs and J-Hook Vanes

Vane Angle
The vane arm portion of all three structures is generally 20-30 degrees measured upstream from the tangent line where the vane intercepts the bank. The 20-30 degree angle provides the longest vane length and protects the greatest length of streambank. The vane portion of the structure should occupy 1/3 of the bankfull width of the channel, while the "hook" should occupy the center 1/3. Maximum velocity, shear stress, stream power and velocity gradients are decreased in the near-bank region and increased in the center of the channel. Sediment transport competence and capacity can be maintained as a result of the increased shear stress and stream power in the center 1/3 of the channel. Backwater is created only in the near-bank region, and the small departure angle gently redirects the velocity vectors from the near-bank region, reducing active bank erosion. The scour pool in the center 1/3 of the channel provides energy dissipation and holding cover for fish. The "hook" portion of the vane produces a longer, wider and deeper pool than that created by vane-only structures. The downstream pool dissipates energy and provides fish habitat. The 1/4 - 1/3 rock diameter gaps between the rocks associated with the hook creates a vortex or corkscrew flow that diversions. The flatter and smaller vane angle arm will extend farther upstream to intercept proportionately more water and increase the length of bank protected.

Vane Slope
The slope of the vane extending from the bankfull stage bank should vary between 2-7percent. Vane slope is defined by the ratio of bank height/vane length. For installation in meander bends, ratios of J-Hook Vane length/bankfull width is calculated as a function of the ratio of radius of curvature/bankfull width and departure angle (Table 1). Equations for predicting ratios of J-Hook Vane spacing/bankfull width on meander bends based on ratio of radius of curvature/bankfull width and departure angle is shown in Table 2. Vane length is the distance measured from the bankfull bank to the intercept with the invert elevation of the streambed at 1/3 of the bankfull channel width for either Cross-Vanes or J-Hook Vanes.

Table 1. Equations for predicting ratio of vane length/bankfull width (VL) as a function of ratio of radius of curvature/width and departure angle, where W = bankfull width. (SI units)

Rc/W	Departure Angle (degrees)	Equation
3	20	VL = 0.0057 W + 0.9462
3	30	VL = 0.0089 W + 0.5833
5	20	VL = 0.0057 W + 1.0462
5	30	VL = 0.0057 W + 0.8462

Table 2. Equations for predicting ratio of vane spacing/width (Vs) as a function of ratio of radius of curvature/width and departure angle, where W = bankfull width (SI units)

Rc/W	Departure angle (degrees)	Equation
3	20	Vs = - 0.006 W + 2.4781
3	30	Vs = - 0.0114 W + 1.9077
5	20	Vs = - 0.0057 W + 2.5538
5	30	Vs = - 0.0089 W + 2.2067

The spacing of J-Hook Vanes can be increased by 0.40W if there exists a low bank erosion hazard rating (BEHI) of less than 30.

Bank Height
The structure should only extend to the bankfull stage elevation. If the bank is higher, a bankfull bench is constructed adjacent to the higher bank and the structure is integrated into the bench.

Footers
The minimum footer depth at the invert for cobble and gravel bed streams should be a ratio of three times the protrusion height of the invert rock. This measurement is used for all three structures. For sand bed streams, the minimum depth is doubled due to the deeper scour depths that occur. All rocks for all three structures require footers. If spaces are left between the invert rocks for Cross-Vane and W Weirs, then the top of the footer rocks becomes the invert elevation for grade control. If no gaps are left, then the top of the surface rock becomes the base level of the stream.

Materials
The Cross-Vane can be constructed with boulders, logs and a combination of both. A geotextile fabric is required to prevent scour under the structure when logs are used or when rocks are used in sand or silt/clay bed channels.

APPLICATIONS

Irrigation Diversions
Cross-Vanes and W-Weirs have both been used successfully for irrigation structures.
Both the Cross-Vane and W-Weir create a differential head in the near-bank region due to the flat slope of the vane leading to the bank. This condition provides the head to deliver water to the head gate at very low flows so that it is not necessary to construct sacrificial dams at low flows. When the head gate is closed during high flows, fine sediments often accumulate. To prevent the sediment deposition at the head gate and in the irrigation canal, a sediment sluice gate is installed so that the sediment is delivered back to the channel during normal high flows.

Grade Control
The Cross-Vane is used to maintain base level in both riffle/pool channels, rapids-dominated stream types and in step-pool channels. The Cross-Vane, as used for grade control, maintains the new width/depth ratio, entrenchment ratio, reduces bank erosion, dissipates energy and improves fish habitat. Spacing of the structures is based on a negative power function relationship of the ratio of pool spacing / bankfull width as a function of slope.

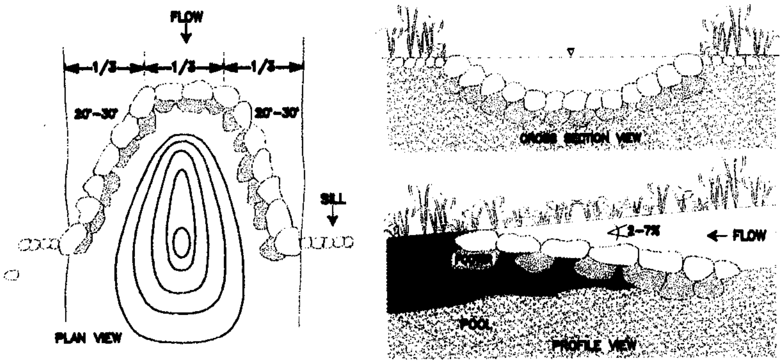
$$Ps = 8.2513\ S^{-0.9799}$$

Where Ps = the ratio of pool to pool spacing/bankfull width
S = channel slope in percent

Bridge Protection
Bridges constructed on a skew to the channel and/or placed on an outside bend often experience abutment scour and embankment erosion. This problem can be reduced by the placement of an offset Cross-Vane in the upstream reach. The vane on the outer bank in the bend has a flatter slope and smaller angle (20°), while the vane arm on the inside bank has a steeper slope and a larger angle (30°). W-Weirs are particularly useful for reducing center pier scour. Both the Cross-Vane and W-Weir can provide grade control, prevent lateral migration of channels, eliminate fish migration barriers, increase sediment transport capacity and competence and reduce footer scour. J-Hook Vanes can reduce bank erosion on outside banks both for the approach and downstream reaches of the bridge.

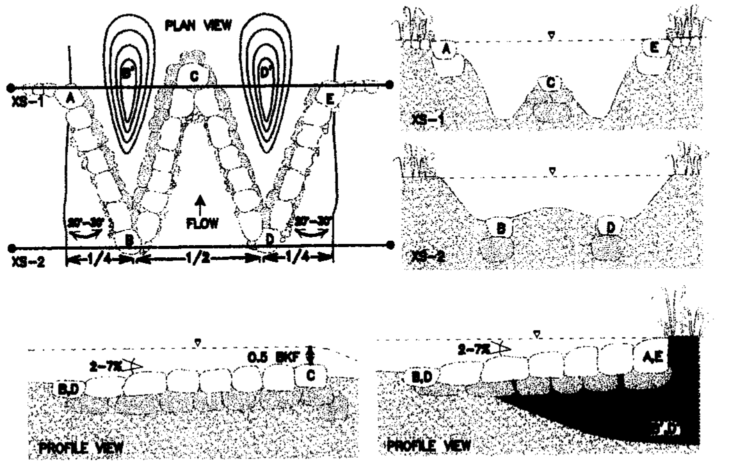
Streambank Stabilization
The J-Hook Vane is designed to reduce accelerated streambank erosion on the outside bend of meanders. As a minimum, the amount of bank protected is two times the vane length, while maximum spacing provides approximately three times the bank protection to vane length. If both banks are eroding due to confinement (lateral containment) and entrenchment (vertical containment), then the Cross-Vane decreases the stream power and shear stress concurrently on both banks. This avoids lining or hardening both banks through a reach to provide protection.

CROSS-VANE ROCK WEIR
Cross-vane Rock Weirs are grade control structures designed to slow the energy of a stream that would otherwise increase stream bank erosion. These devices are appropriate in areas of high gradient (large elevation change in a short distance). The function of the Cross-vane Rock Weir is to concentrate the effects of large elevation change in a stream channel into a more controlled situation while at the same time allowing fish passage and a low-flow stream channel. The stone should be trenched into the stream bank at sharp angles in a general "V" shape pointing upstream. Two lines of rock are utilized to create a stable structure, utilizing the principle that water will flow off of immovable objects atright angles (90° angles). The downstream line of rock should be trenched into the stream bottom so that the tops of the rock are approximately level with the stream bottom. The upstream line of rock should be overlapped onto the downstream line of rock and the device should be elevated appropriately, the center lower than at the stream banks, to concentrate the flow into the center of the stream channel. The Cross-vane Rock Weir will provide mid-channel scour pool that will provide fish habitat as well as the ability for fish to maneuver and migrate past them upstream.



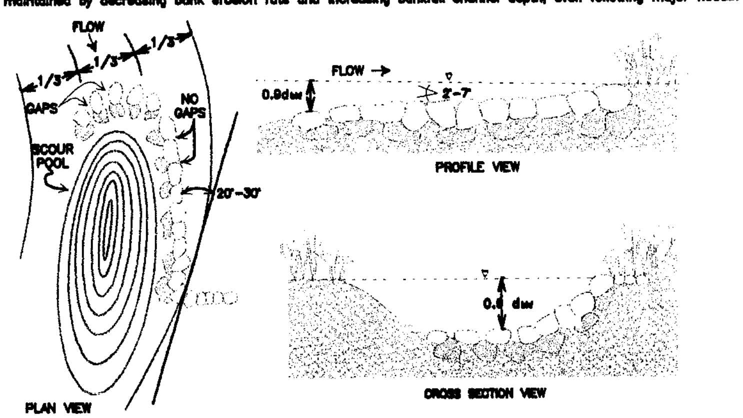
ROSGEN DESIGN - CROSS VANE ROCK WEIR

W-Weir
The design of the W-Weir (W as looking in the downstream direction) was initially developed to resemble bedrock control channels on larger rivers. The W-Weir is similar to a Cross-Vane in that both sides are vanes directed from the bankfull bank upstream toward the bed with similar departure angles. From the bed at 1/4 and 3/4 channel width, the crest of the weir rises in the downstream direction to the center of the bankfull channel creating two thalwegs. The objectives of the structure are to provide grade control, enhance fish habitat, stabilize stream banks, facilitate irrigation diversions, reduce bridge center pier and foundation scour, and increase sediment transport at bridge locations. Habitat for fish may be enhanced by maximizing usable holding, feeding and spawning areas. Fish hold in the multiple feeding lanes created by the two thalweg locations and pools. Spawning habitat is created in the tail-out of the pools due to upwelling currents and a sorting of gravel bed material sizes.



ROSGEN DESIGN - W-WEIR

J-Hook Vane
The J-Hook Vane is an upstream directed, gently sloping structure composed of natural materials. The structure can include a combination of boulders, logs and root wads and should be located on the outside of stream bends where strong downwelling and upwelling currents, high boundary stress, and high velocity gradients generate high stress in the near-bank region. The structure is designed to reduce bank erosion by reducing near-bank slope, velocity, velocity gradient, stream power and shear stress. Redirection of the secondary cells from the near-bank region does not cause erosion due to back-eddy re-circulation. The vane portion of the structure occupies 1/3 of the bankfull width of the channel, while the "hook" occupies the center 1/3. The 1/4 - 1/3 rock diameter gaps between the rocks associated with the hook creates a vortex or corkscrew flow that increases the "center-channel" shear stress. The center of the channel associated with the hook is efficient at transporting sediment, debris and improving channel capacity and sediment competence. Width/depth ratios are maintained by decreasing bank erosion rate and increasing bankfull channel depth, even following major floods.



ROSGEN DESIGN - CROSS VANE WEIR

Stream Enhancement Construction Details

FIGURE 15m