PROGRESS REPORT: PHASE I COMPLIANCE PLAN FOR CHLORIDE AMD TREATMENT PLANT DISCHARGES IN NORTHERN WEST VIRGINIA

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1.0 INTRODUCTION

On October 26, 2004 (amended December 29, 2004 and June 1, 2007), the West Virginia Department of Environmental Protection (WVDEP) issued Administrative Order No. 133 (AO) to Consolidation Coal Company and Windsor Coal Company (collectively, CONSOL), involving six CONSOL mining operations in Northern West Virginia that the West Virginia Department of Environmental Protection (WVDEP) had found were causing, or likely to cause violations of the water quality standards for chloride. A total of nine outfalls are affected by the AO, as shown in Table 1, **Appendix A** and Figures, **Appendix B**. These outfalls discharge into the headwaters of relatively small creeks that are not capable of providing adequate flow under low flow conditions to allow a mixing zone capable of providing sufficient protections above water quality criteria.

On May 13, 2005, CONSOL submitted an Application for a Variance from the Numeric Criteria for Chloride set forth in the West Virginia Water Quality Standards. Following the submission of additional information and studies, as well as two public meetings, on September 5, 2007, the WVDEP denied CONSOL's variance application. Therefore, provisions for determining alternative handling and disposal options are necessary for the continued, compliant operation of mining operations and acid mine drainage treatment facilities in this portion of the State. In accordance with the AO, a Phase I Compliance Plan was submitted in January, 2008. This progress report will provide the WVDEP with an update on the progress made by CONSOL and their consultants that have been addressing the issue, and the status of remedial alternatives available to mitigate the problem at each outfall.

2.0 PROGRESS TO DATE

General Data Collection

Baseline environmental and land data collected to support evaluation of considered remedies have included:

- GPS mapping of AMD Plant water sources - **completed**.
- Chemical monitoring for sources of water (collected & analyzed samples) – **ongoing**.
- CONSOL land agents have initiated discussions with owners of key parcels for new pipelines, treatment, storage, and disposal facilities - **ongoing**.

- Meetings with potential users of the water to determine if it can be utilized for cooling water in power generation and water floods for the development of oil and gas - **ongoing**.
- Order-of-magnitude engineering designs and cost estimates are being developed for pipeline alternatives - **ongoing**.
- Cost estimates reflective of current conditions were completed for Reverse Osmosis alternatives - **ongoing**.

3.0 ALTERNATIVES CONSIDERED

Inter-mine Water Transfers: Throughout northern West Virginia, CONSOL moves significant amounts of water between previously mined and now flooded areas (mine pools). The purpose of this is to reduce the number of treatment facilities serving closed operations. This provides CONSOL significant cost savings through economies of scale. There may be opportunities in the areas west and northwest of Morgantown to utilize existing CONSOL mine pools to transmit water to established treatment facilities near the Monongahela River. By implementing inter-mine water transfers through the mine pool network, the footprint of pipelines and treatment plants could possibly be reduced. This would enhance centralized water treatment capabilities and potentially eliminate smaller plants. For the plants west of Fairmont, this may not be a viable alternative since the dip of the mine pools is to the west against our active mines and ownership of the mine pools is held by other parties. CONSOL is evaluating whether the potential liability for pumping into mine pools owned by others presents a significant liability issue.

Deep Well Injection of Treated Effluent: CONSOL has been in contact with oil and gas operators in Northern West Virginia to determine if it may be viable for chloride-impacted waters to be injected under pressure into oil and gas strata for enhanced oil and gas recovery (EOR water floods). The targeted formations include the Big Injun, Weir and Gordon. Even though an operator may want the AMD water for enhanced recovery, the duration, location and scale of their program could make long-term effectiveness questionable. Furthermore, literature reviews for NWV area have shown unfavorable results due to geological (porosity and permeability) constraints. In the St. Leo area west of Morgantown, it may never the less be prudent to perform an effluent injection pilot test since other treatment alternatives for this plant may prove to be cost prohibitive. Permitting for underground injection would be anticipated for this alternative.

Reverse Osmosis: This process would require that the number of steps in treating the mine water be greatly increased. The treated mine water would need to go through pretreatment (water softening) which would remove the less soluble salts and scale-inducing compounds. This pre-treated mine water would be processed through a thin film composite membrane which is the heart of the reverse osmosis system. However, significant solid and liquid waste streams would need post treatment which could include concentrated brines which would likely need to be crystallized unless brine disposal would be viable. The evaporation / crystallization process is

very energy intensive. The remaining solids would have to either be marketed for road salt or disposed in an appropriate disposal facility.

Pipelines: Pipelines are costly to build and have the potential for off-site releases. In the worst-case scenario there could be over 50 miles of pipelines required to convey treated AMD water to larger receiving streams. Land acquisition would be an enormous obstacle to overcome. In the Monongalia, Marion and Harrison Counties' portion of this project, it is estimated that over 100 different land owners would need to grant access for the pipeline(s) crossing.

In this report there are numerous references to a pipeline system that could convey treated AMD water from the various plants in Monongalia, Marion and Harrison Counties to the Monongahela River. This is a potential alternative for consideration which would consist of branch lines being plumbed to a larger trunk line. The trunk line would extend from near Metz, West Virginia to Fairmont, West Virginia where an NPDES discharge to the Monongahela River could be permitted.

Flow Augmentation: CONSOL is evaluating mixing as technology to meet water quality based effluent limits after the basic effluent guideline treatment at five of the nine impacted outfalls. The base flow of receiving streams would be supplemented using water retained by impoundments in nearby watersheds. This approach would also allow a more consistent chloride load during dry periods. Engineering studies are underway to evaluate impoundment placement options and water availability. This would also require federal and state permitting.

Other Treatment Systems: CONSOL chemists are performing periodic literature reviews and maintaining contacts with companies that are testing and applying innovative remedial technologies for chloride and TDS removal. If an innovative technology were to be selected for use, it would have to be field tested prior to full-scale roll out. CONSOL has investigated a technology being developed and tested in Pennsylvania by Winner International which involves a liquid-to-liquid extraction of the chloride ion. This technology is not yet developed for removal of dissolved ions and was not found to be a viable alternative at this time. Also, CONSOL investigated the technology of ultra high lime with aluminum additions as a mechanism of chloride removal. Bench-scale testing was conducted at St. Leo but was found not to be a viable alternative for chlorides removal at this time.

4.0 STATUS OF INDIVIDUAL OUTFALLS

The Outfalls in the Harrison, Marion, and Monongalia Counties will be discussed first and in order from furthest south (Robinson Run - Lowe AMD TP) to furthest north (Blacksville No. 2 - Beaver Pond AMD TP). The outfalls in the Northern Panhandle will be discussed in the same south to north order.

4.1 Robinson Run - Lowe AMD TP

Pumping water from the Robinson Run Mine is necessary to prevent underground mine water from infiltrating into the active operations. This water is discharged to Robinson Run Lowe AMD TP which discharges into Harris Fork. Chloride concentrations from the outfall are typically less than 400 mg/L with the average influent rate being about 1,000 gpm, with a peak rate in excess of 2,500 gpm. A major issue existing at the Lowe AMD TP and impoundment is the significant quantities of precipitation induced runoff which are put into the impoundment and discharged. In the current condition this is not a problem since all of the water is discharged with little consequence. However, to engineer an efficient, chloride-compliant discharge at Lowe, the precipitation induced runoff should be removed from the process for the pipeline and treatment options.

Alternatives to manage the chloride discharges at the Lowe AMD TP currently under evaluation include:

- Pipeline(s) to Larger Receiving Streams
- Flow Augmentation to Mix the AMD Discharge with Impounded Precipitation
- Reverse Osmosis or Other Treatment System

Option 1 – Install a Pipeline to Larger Receiving Streams

There are two options for conveying the AMD TP discharge to larger receiving streams. The first option is to convey the water north to the Thorne AMD TP and the combined discharge would then be put into the trunk line that would extend from Metz, West Virginia to Fairmont, West Virginia. The branch that goes from Lowe to Thorne would be approximately 32,000 feet long. The alternative pipeline route follows Robinson Run beltline conveyor and along a CONSOL right-of-way (ROW) that extends to the Allegheny Energy Harrison Power Plant at the West Fork River. The trunk line pipeline has been found to be infeasible due to permitting restrictions including the need to attain 300 foot buffer zone waivers from property owners along the planned route. However, the alternative pipeline route is still under consideration and being evaluated by an independent consultant. This alternative remains viable in large part due to the ROW ownership by CONSOL.

The following preliminary schedule is proposed for the alternative pipeline:

Feasibility Analysis	3 Months
Final Design	9 Months
Permitting	Undefined
Construction	18 - 24 Months (from permit issuances)

Option 2 – Flow Augmentation to Mix the AMD Discharge with Impounded Precipitation

Large surface impoundments would need to be built in adjacent hollows so that the precipitation would be captured for use in flow augmentation. The impoundments would have to be sized to

withstand large withdrawals during dry years. CONSOL is working with independent consultants to determine the efficacy of such an approach. Preliminary loading calculations have been completed and engineering studies on the preliminary designs including chemical and hydrologic modeling of the areas are underway

The following preliminary schedule is proposed for the impoundment option:

Feasibility Analysis	3 Months
Final Design	12 Months
Permitting	Undefined
Construction	24 - 30 Months (from permit issuances)

Option 3 – Install a Reverse Osmosis or Other Treatment Process

CONSOL has revised the cost estimates on RO treatment and is further evaluating this information along with other factors such as adequate power supply, truck accessibility, and acquirable land. As three phase power is not readily available in many rural areas negotiations with local power providers would need to occur as part of the assessment. This option appears to remain economically non-viable.

4.2 Four States - Thorne AMD TP

Thorne AMD TP treats water removed from the closed O'Donnell Mine (Four States) so that barrier leakage will not jeopardize the active Robinson Run Mine operations. Water in the O'Donnell Mine flows along structural dip and moves toward the west. Unfortunately it is necessary to keep the pumping well at the current location since any increase in water level in O'Donnell will result in an increase of inflow to the Robinson Run Mine. The AMD influent to the Thorne AMD TP is 230 gpm while the chlorides concentration is approximately 340 mg/L.

Options available to manage the chloride discharges at the Thorne AMD TP include:

- Pipeline(s) to Larger Receiving Streams
- Diluting the AMD Discharge with Impounded Precipitation
- Reverse Osmosis or Other Treatment System

Option 1 – Install a Pipeline to Larger Receiving Streams

There are two options which were considered for conveying the AMD TP discharge to larger receiving streams. The first option was to build a pipeline to the north that would connect to a large trunk line extending from near Metz, West Virginia and continuing to near Fairmont, West Virginia and discharging into the Monongahela River. The other alternative would be to build a pipeline to the south that would join the Lowe AMD TP discharge and convey the water along the Robinson Run beltline conveyor and then follow a CONSOL freshwater ROW that extends to the Allegheny Energy Harrison Power Plant at the West Fork River. The trunk line pipeline has been found to be infeasible due to permitting restrictions including the need to attain

300 foot buffer zone waivers from property owners along the planned route. However, the alternative pipeline route is still under consideration and being evaluated by an independent consultant.

The following preliminary schedule is proposed for the alternative pipeline:

Feasibility Analysis	3 Months
Final Design	9 Months
Obtain ROWs	Undefined
Permitting	Undefined
Construction	18–24 Months (from permit issuances and obtaining ROWs)

Option 2 – Flow Augmentation to Mix the AMD Discharge with Impounded Precipitation

Large surface impoundments would need to be built in adjacent hollows so that the precipitation would be captured for flow augmentation. The impoundments would have to be sized to withstand large withdrawals during dry years. CONSOL is working with independent consultants to determine the efficacy of such an approach. Preliminary loading calculations have been completed and engineering studies on the preliminary designs including chemical and hydrologic modeling of the areas are underway

The following preliminary schedule is proposed for the impoundment option:

Feasibility Analysis	3 Months
Final Design	12 Months
Permitting	Undefined
Construction	24-30 Months (from permit issuances)

Option 3 – Install a Reverse Osmosis or Other Treatment Process

CONSOL has revised the cost estimates on RO treatment and is further evaluating this information along with other factors such as adequate power supply, truck accessibility, and acquirable land. As three-phase power is not readily available in many rural areas, negotiations with local power providers would need to occur as part of the assessment. This option appears to remain economically non-viable.

4.3 Llewellyn AMD TP

Llewellyn AMD TP handles water that is pumped from the CONSOL No. 9 Mine so that hydrostatic pressure and water seepage into Loveridge Mine is reduced. Mine water is withdrawn through a single turbine pump. Rainfall within the impoundment watershed drains into the pond. The pumping is intended to keep the water level in CONSOL No. 9 at an elevation between 465 and 480 ft-msl. The Llewellyn AMD TP handles chlorides in excess of 800 mg/L. The peak AMD influent rate is 800 gpm with an average of 640 gpm.

Option 3 – Install a Reverse Osmosis or Other Treatment System

CONSOL has revised the cost estimates on RO treatment and is further evaluating this information along with other factors such as adequate power supply, truck accessibility, and acquirable land. As three-phase power is not readily available in many rural areas, negotiations with local power providers would need to occur as part of the assessment. This option appears to remain economically non-viable.

4.4 St. Leo AMD TP

The St. Leo AMD TP is used to remove water from an active bunker and an active shaft which are adjacent to an older section of the CONSOL Loveridge Mine, which is dewatered by the 4 Left Pump. There are a total of three submersible pumps (4 Left, St. Leo Shaft, St. Leo Submersible Pump) that extract mine water from the CONSOL Loveridge Mine. The chloride concentrations in the effluent are very high at over 1,900 mg/L. The average discharge flow rate out of the plant is 260 gpm.

There are several options available to manage the chloride discharges at St. Leo which include:

- Pipeline(s) to Larger Receiving Streams
- Inter-mine Transfer to Federal No. 1
- Reverse Osmosis or Other Treatment System

Option 1 – Overland Pipeline to Llewellyn AMD TP

The only viable receiving stream for the St. Leo outfall would be the Monongahela River. A 25,000 foot pipeline would need to be constructed from the St. Leo treatment plant to the Llewellyn treatment plant where the two discharges would be combined for final transport to the main trunk line from Mannington to Fairmont, West Virginia. Construction of the main trunk line from Mannington to Fairmont, West Virginia has been found to be infeasible due to permitting and land acquisition constraints including the need to attain 300 foot buffer zone waivers from property owners along the planned route. Construction of a smaller pipeline to the Llewellyn AMD TP is being evaluated by independent consultants and remains a viable alternative at the St. Leo AMD TP.

The following preliminary schedule is proposed for the alternative pipeline:

Feasibility Analysis	3 Months
Final Design	9 Months
Obtain ROW	Undefined
Permitting	Undefined
Construction	15 - 21 Months (from all permit issuances)

Option 2 – Overland Pipeline to Sugar Run AMD TP Discharge into Federal No. 1 Mine

This option would involve the installation of a 25,000 foot overland pipeline from the St. Leo AMD TP to the Sugar Run AMP TP where the two discharges would be combined and injected into the Federal No. 1 mine for eventual treatment at the Flaggy Meadows AMD TP. Approximately half of the land between the Sugar Run AMD TP and St. Leo is owned by CONSOL; therefore ROW issues for this option might be relatively easy to address.

This alternative would have the advantage of reducing the need to treat water at the St. Leo AMD TP as the effluent would be combined with Sugar Run AMD TP. The disadvantages of this alternative include numerous pumping stations to accommodate the terrain, numerous stream and road crossing permits, and ROW negotiations. The alternative that involves routing the water through Federal No. 1 for eventual treatment at the Flaggy Meadows AMD TP is still under consideration and being evaluated by an independent consultant.

The following preliminary schedule is proposed for the alternative pipeline:

Feasibility Analysis	3 Months
Final Design	9 Months
Obtain ROW	Undefined
Permitting	Undefined
Construction	18 - 24 Months (from permit issuances and obtaining ROWs)

Option 3 – Reverse Osmosis or Other Treatment System

CONSOL has revised the cost estimates on RO treatment and is further evaluating this information along with other factors such as adequate power supply, truck accessibility, and acquirable land. As three-phase power is not readily available in many rural areas, negotiations with local power providers would need to occur as part of the assessment. This option appears to remain economically non-viable.

4.5 Sugar Run AMD TP

The Sugar Run AMD TP receives water from a number of sources. These include runoff water from the prep plant and inactive areas, refuse area sedimentation ponds, and underground mine water from active operations.

Several options have been considered to address the chloride discharges at the Sugar Run AMD TP. These include:

- Inter-Mine Transfer to Federal No. 1 Mine Pool
- Pipeline(s) to Larger Receiving Streams
- Re-Plumbing of Problematic Mine Water Sources to Harvey Run Slurry Impoundment since CONSOL Engineers believe that discharge may be eliminated by water recycling
- Reverse Osmosis or Other Treatment System

Option 1 – Inter-mine Transfer to Federal No. 1 Mine Pool

Sugar Run AMD TP is located approximately 7,500 feet from the western barrier of the Federal No. 1 Mine pool. A pipeline would be constructed eastward from the AMD plant to just east of the barrier. An injection borehole would be completed to the Pittsburgh No. 8 mine void where the AMD effluent would be injected. Property rights between Sugar Run TP and the proposed injection point into Federal No. 1 would have to be acquired. Water would eventually be discharged at the Flaggy Meadows AMD TP. This alternative is under investigation by an independent consultant and is currently considered a viable alternative.

The following preliminary schedule is proposed for the underground Inter-mine transfer:

Feasibility Analysis	3 Months
Final Design	6 Months
Obtain ROW	Undefined
Permitting	Undefined
Construction	6-12 Months (from permit issuances and obtaining ROWs)

Option 2 – Install a Pipeline to Larger Receiving Streams

A 26,000 foot branch line was considered which would have been constructed to the Llewellyn branch line. After the two branch lines were connected the combined flow of Llewellyn, St. Leo and Sugar Run would have been conveyed to the main trunk line that extended from near Metz, West Virginia to Fairmont, West Virginia. Construction of the main trunk line from Mannington to Fairmont, West Virginia has been found to be infeasible due to permitting and land acquisition constraints including the need to attain 300 foot buffer zone waivers from property owners along the planned route. This alternative is no longer considered to be viable.

Option 3 – Re-plumb High Chloride Source Waters to Harvey Run Surface Impoundment

The highest chloride source water at the Sugar Run AMD TP is the underground pump that currently discharges water from the active underground operation to the in-line sump area. A pipeline was considered which would convey the underground pump water up the valley to the Harvey Run Surface Impoundment where the solids would be settled and the decanted water could be re-circulated through the mining process. This alternative has been found to be infeasible and is no longer considered a viable alternative.

Option 4 – Install a Reverse Osmosis or Other Treatment Process

CONSOL has revised the cost estimates on RO treatment and is further evaluating this information along with other factors such as adequate power supply, truck accessibility, and acquirable land. As three-phase power is not readily available in many rural areas, negotiations with local power providers would need to occur as part of the assessment. This option appears to remain economically non-viable.

4.6 Blacksville – Beaver Pond AMD TP

The Beaver Pond AMD TP is used as an intermittent discharge to West Virginia Fork. During the wet season, storm water increases the flow of the discharge and due to this dilution; the chloride concentrations should typically meet the required effluent limits for most of the year. However during the dry seasons the effluent limits could be expected to exceed criteria. Fortunately, during dry periods the mine normally uses all the water they can obtain from this source for prep plant makeup water. Typically, there is no Beaver Pond discharge during these dryer times. Never the less, several options have been evaluated for addressing potentially non-compliant discharges.

- Recycle All Water for Use in the Mining and Coal Preparation Process
- Inter-Mine Transfer of Water to Blacksville Mine Pool
- Reverse Osmosis or Other Treatment System

Option 1 - Recycle All Water for Use in the Mining and Coal Preparation Process

A new AMD plant at the Beaver Pond AMD TP provides CONSOL additional control for this discharge. The possibility was considered that the Beaver Pond discharge could be controlled through water management strategies with the discharge potentially eliminated, however this was found to be infeasible. Additionally, the possibility of recycling the water to the mine pool or utilizing the water at the prep plant was explored. This option was found to have significant benefits to minimizing chloride discharges but did not constitute a complete elimination of the potential for discharge of higher chloride water. A variation on this alternative, the potential for permitting the discharge using real-time water quality management, is also under investigation. Hydrologic studies designed to evaluate how long water would have to be held at the site and if additional holding capacity is available are planned.

The time necessary for design, permitting and construction of structures necessary to support this alternative remain undefined as the feasibility study is not complete. The following preliminary schedule is proposed for the real-time water quality management alternative:

Feasibility Analysis	6 Months
Final Design	Undefined
Permitting	Undefined
Construction	Undefined

Option 2 - Inter-Mine Transfer Of Water to Blacksville Mine Pool

A second option for handling this water is an overland pipeline to the Blacksville No. 1 Mine. CONSOL owns most of the surface parcels between the Beaver Pond AMD TP and Blacksville No. 1. This pipeline would be approximately 13,000 feet long. From Blacksville No. 1 the water could be transferred over the barrier with Humphrey and from there make its way to the Flaggy Meadows AMD TP where it may be discharged to Flaggy Run along the Monongahela River. This alternative would eliminate the current treatment system since it would be replaced

by a drop borehole into Blacksville No. 1. Permitting of extraction/injection boreholes at Blacksville No. 1 and Humphrey would be needed for this activity. This is currently considered to be a viable alternative at Blacksville No. 2 and is being evaluated by independent consultants.

The following preliminary schedule is proposed for the underground Inter-mine transfer:

Feasibility Analysis	3 Months
Final Design	6 Months
Permitting	Undefined
Construction	8-12 Months (from permit issuances)

Option 3 – Install a Reverse Osmosis or Other Treatment Process

CONSOL has revised the cost estimates on RO treatment and is further evaluating this information along with other factors such as adequate power supply, truck accessibility, and acquirable land. As three-phase power is not readily available in many rural areas, negotiations with local power providers would need to occur as part of the assessment.) This option appears to remain economically non-viable.

SHOEMAKER – 8 NORTH AIR SHAFT AND DUPONT HOLLOW AMD TP's

The two NPDES discharges with chloride issues at Shoemaker Mine are the DuPont Hollow Treatment Plant and the 8 North Sedimentation Pond serving the 8 North Air Shaft.

4.7 8 North Air Shaft

A network of pumps and pipes collects water from bleeders in the 7 North and 8 North areas and concentrates them in a sump near the Golden Ridge Portal Shaft. As much as 200 gallons per minute (gpm) of mine water is pumped through a line that eventually daylights at a ditch near the eastern side of the Golden Ridge Portal. The average discharge rate is about 80 gpm while the average chloride concentration is below 800 mg/L. Options investigated to address the discharge included:

- Underground and Surface Pipeline Discharging to the Ohio River
- Re-plumbing 8 North Discharge to an Abandoned Mine
- Flow Augmentation to Mix the AMD Discharge with Impounded Precipitation
- Redirecting Water to Whitaker Shaft and Installing Reverse Osmosis

Option 1 – Underground and Surface Pipeline Discharging to the Ohio River

At this time, this alternative was found to be the most viable and feasible alternative. Preliminary designs and cost estimates have been completed for underground movement of discharge at Shoemaker Mine. However, further underground safety evaluations are ongoing.

The following preliminary schedule is proposed for the rerouting of the discharge:

Feasibility Analysis	3 Months
Final Design	6 Months
Obtain ROW	Undefined
Permitting	Undefined
Construction	15-18 Months (from permit issuances and obtaining ROWs)

Option 2 – Re-plumbing 8 North Discharge To an Abandoned Mine

This alternative was explored but found to be infeasible and is no longer under consideration.

Option 3 – Flow Augmentation to Mix the AMD Discharge with Impounded Precipitation

Large surface impoundments would need to be built in adjacent hollows so that the precipitation would be captured for flow augmentation. The impoundments would have to be sized to withstand large withdrawals during dry years. CONSOL is working with independent consultants to determine the efficacy of such an approach by evaluating available precipitation and sources of dilution water in addition to engineering evaluations of impoundment placement and sizing options.

The following preliminary schedule is proposed for the impoundment option:

Feasibility Analysis	3 Months
Final Design	12 Months
Permitting	Undefined
Construction	2-2 ½ Years (from all permit issuances)

Option 4 – Install a Reverse Osmosis or Other Treatment Process

CONSOL has revised the cost estimates on RO treatment and is further evaluating this information along with other factors such as adequate power supply, truck accessibility, and acquirable land. As three-phase power is not readily available in many rural areas, negotiations with local power providers would need to occur as part of the assessment. This option appears to remain economically non-viable.

4.8 Dupont Hollow

Water from the western portion of the Shoemaker Mine accumulates in a Dam Room. The Dam Room is an area in the western portion of the mine near the main entry that is used to gather underground mine water. The water from the Dam Room is pumped to the surface and treated with sodium carbonate briquettes prior to the NPDES discharge. The typical flow rate from the DuPont Hollow plant is 210 gpm with chloride concentrations of 820 mg/L. Storm water is not treated at the DuPont Hollow facility.

There are several options available to manage the chloride discharges at Shoemaker. These include:

- Divert the High Chloride Discharges via Overland Pipeline to the Ohio River
- Re-plumb the Discharge to Abandoned Mineworks in the 3 South Portion of the Mine
- Install a Reverse Osmosis / Desalination Plant near 8 North Airshaft

Option 1 - Overland Pipeline for Discharge at the Ohio River

An existing 4-inch PVC line from at the Golden Ridge Portal which is directly adjacent to the 8 North Air Shaft could be utilized for piping the high chloride water to the Whitaker Portal. There is another existing 4-inch PVC line at Whitaker that could be used to complete the plumbing of the water to near the Dam Room. From the Dam Room the water could be pumped via a turbine pump to the surface where it would undergo AMD treatment. A pipeline that follows the path of a proposed conveyor belt (currently under construction) could carry the water to a new or existing NPDES outfall on the Ohio River.

This alternative was found to be the most viable and feasible alternative. Rerouting of the discharge would be coupled with additional permitting requirements.

The following preliminary schedule is proposed for the alternative pipeline:

Final Design	9 Months
Permitting	Undefined
Construction	12 months (from permit issuances)

Option 2 – Re-plumb the 8 North Discharge to Abandoned Mineworks

The existing 4-inch PVC line could potentially be plumbed through existing seals at the entries of the 3 South area. Currently the seals are wet and the water elevation behind the seals is unknown. The environmental engineer at the Moundsville Operations Office is researching land access for the installation of a monitoring well that will extend into the sealed 3 South Area. A location near the down dip portion of this area would be selected for the monitoring well so that an estimate of the storage capacity of the area is determined. This alternative is still under investigation.

The following preliminary schedule is proposed for the underground Inter-mine transfer:

Feasibility Analysis	3 Months
Final Design	6 Months
Permitting	Undefined
Construction	1 Year (from permit issuances)

Option 3 - Redirect the Minewater to the Whitaker Shaft Site / Install an R.O. & Desalination Plant

This alternative was evaluated by CEC (2003, 2006) and has been found to be technically and economically infeasible.

4.9 Windsor – Huff Run AMD TP

The Huff Run AMD TP treats mine water extracted from the Beech Bottom Mine in order to prevent that mine from discharging along drift openings along Short Creek. Mine pool water elevation is maintained at an elevation of 849 ft-msl so that an anticline along the bottom of the coal seam is not exceeded. If water goes over the crest of the anticline, AMD issues from drift openings at lower elevations. The 849 ft-msl control elevation is specified in the NPDES permit (WV1011456) since it is protective of the neighboring surface water. Chloride concentrations from the Huff Run AMD TP are approximately 600 mg/L. The chloride limits in the NPDES permit are 218 mg/l as a monthly average and 378 mg/l as the daily maximum.

The coal dips to the southeast, away from the Ohio River, which means that there is no mine pool developed in proximity to the river. This increases the difficulty in transporting the effluent to the Ohio River since the mine pool can not be used to convey treatment plant water to the west. Dinsmore & Shohl, LLP (2006) produced a letter report on behalf of CONSOL which indicated that the options of piping the chloride-impacted effluent along Huff Run are not viable. Subsequent internal discussions indicated that alternative pipeline transport corridors suffered from the same short comings and have therefore been removed from consideration.

There are several options available to manage the chloride discharges at Windsor. These include:

- Divert the High Chloride Discharges via Underground Plumbing to the Ohio River
- Flow Augmentation to Mix the AMD Discharge with Impounded Precipitation
- Install a Reverse Osmosis / Desalination Plant Near 8 North Airshaft.

Option 1 - Overland Pipeline for Discharge at the Ohio River

CONSOL Land has recently investigated the use of utilizing roadway ROWs for the installation of a pipeline to carry the water to the Ohio River. Negotiations between the WVDOT and CONSOL are on going to determine if utilizing existing road rights of way for this pipeline will provide an adequate path. The potential to construct a pipeline is still being evaluated with different ROWs under consideration.

The following preliminary schedule is proposed for the alternative pipeline:

Feasibility Analysis	3 Months
Final Design	9 Months
Permitting	Undefined
Construction	12-18 Months (from permit issuances)

Option 2 – Flow Augmentation to Mix the AMD Discharge with Impounded Precipitation

Large surface impoundments would need to be built in adjacent hollows so that the precipitation would be captured for use as dilution water. The impoundments would have to be sized to withstand large withdrawals during dry years. CONSOL is working with independent consultants to determine the efficacy of such an approach by evaluating available precipitation and sources of dilution water in addition to engineering evaluations of impoundment placement and sizing options.

The following preliminary schedule is proposed for the impoundment option:

Feasibility Analysis	3 Months
Final Design	12 Months
Permitting	Undefined
Construction	24 – 30 Months (from permit issuances)

Option 3 – Reverse Osmosis Treatment Plant

CONSOL has revised the cost estimates on RO treatment and is further evaluating this information along with other factors such as adequate power supply, truck accessibility, and acquirable land. As three-phase power is not readily available in many rural areas negotiations with local power providers would need to occur as part of the assessment. This option appears to remain economically non-viable.

5.0 SCHEDULE

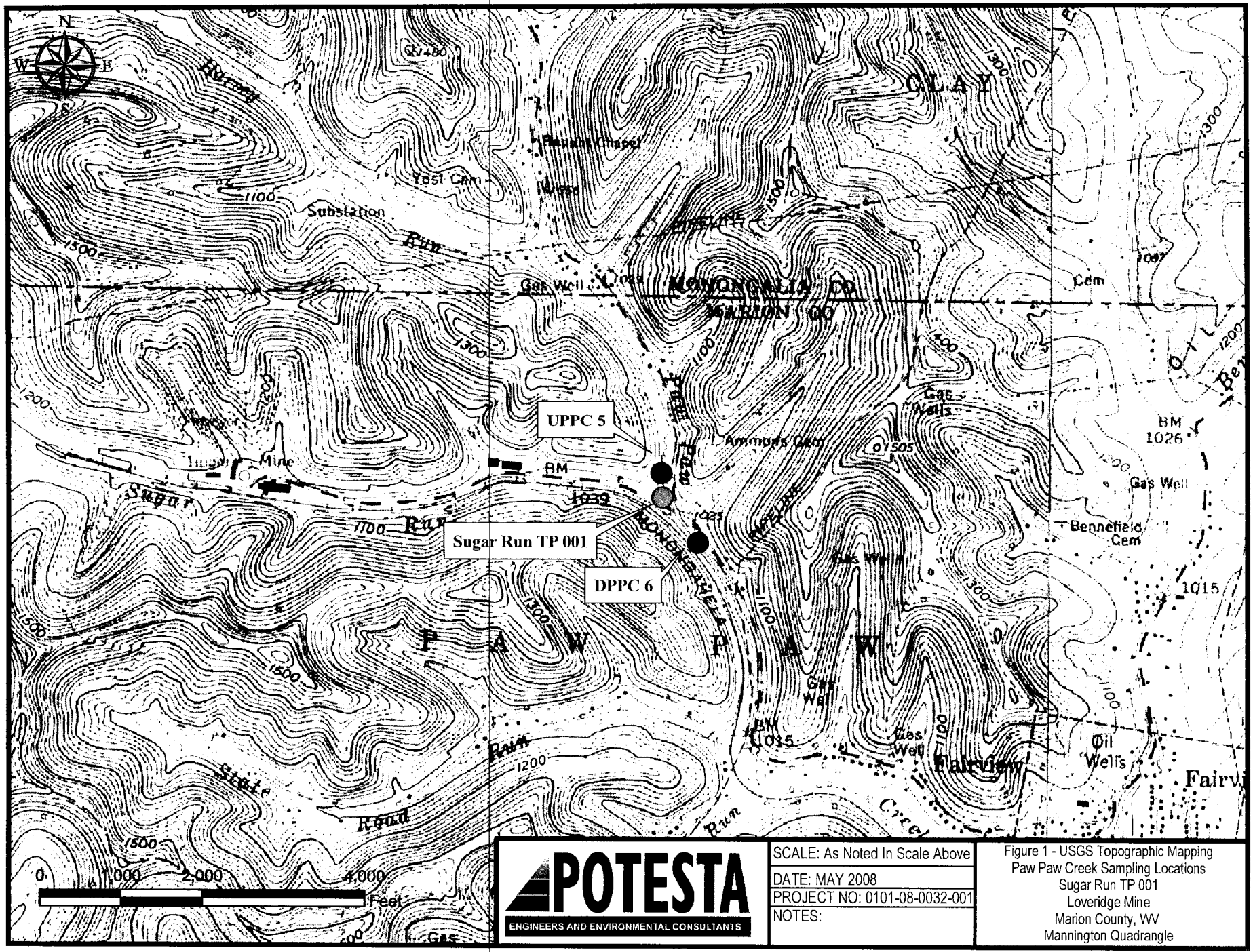
The following summarizes CONSOL's schedule for complying with the chloride standard:

- Develop Alternatives and Cost Comparisons – December 2008
- Preliminary Engineering Design for Alternatives – December 2008
- Evaluate ROW Alternatives for Pipelines – December 2008
- Submit Phase II Compliance Plan by January 31, 2009
- WVDEP Approves Phase II Compliance Plan – July 1, 2009
- Prepare and Submit Permit Applications – January 1, 2010

TABLE 1

Mining Permits and Outfalls Referenced in Administrative Order No. 133 Between the West Virginia Department of Environmental Protection Issued to Consolidation Coal Company and Windsor Coal Company (Collectively, CONSOL)

Mine	NPDES	Facility Name	Outlet Number	Streams For Which Variance is Requested
Four States	WV 0050598	Thorne AMD TP	002	UNT of Buffalo Creek to Buffalo Creek to the Monongahela River
Loveridge	WV 0040711	Sugar Run AMD TP	001	Paw Paw Creek to the Monongahela River
	WV 0040711	Llewellyn AMD TP	007	Llewellyn Run to Buffalo Creek to the Monongahela River
	WV 0040711	St. Leo AMD TP	016	South Fork of Dunkard Creek to the West Virginia Fork of Dunkard Creek
Robinson Run	WV 0093505	Lowe AMD TP	011	Harris Fork to Bingamon Creek to the West Fork River
Shoemaker	WV 0004201	Dupont Hollow AMD TP	003	UNT of Boggs Run to Boggs Run to Browns Run to the Ohio River
	WV 0004201	8 North Air Shaft	018	UNT of Wheeling Creek to Wheeling Creek to the Ohio River
Blacksville No.2	WV 0064602	Beaver Pond AMD TP	003	West Virginia Fork - Dunkard Creek
Windsor	WV 1011456	Huff Run AMD TP	001	UNT of Huff Run and Huff Run of Short Creek



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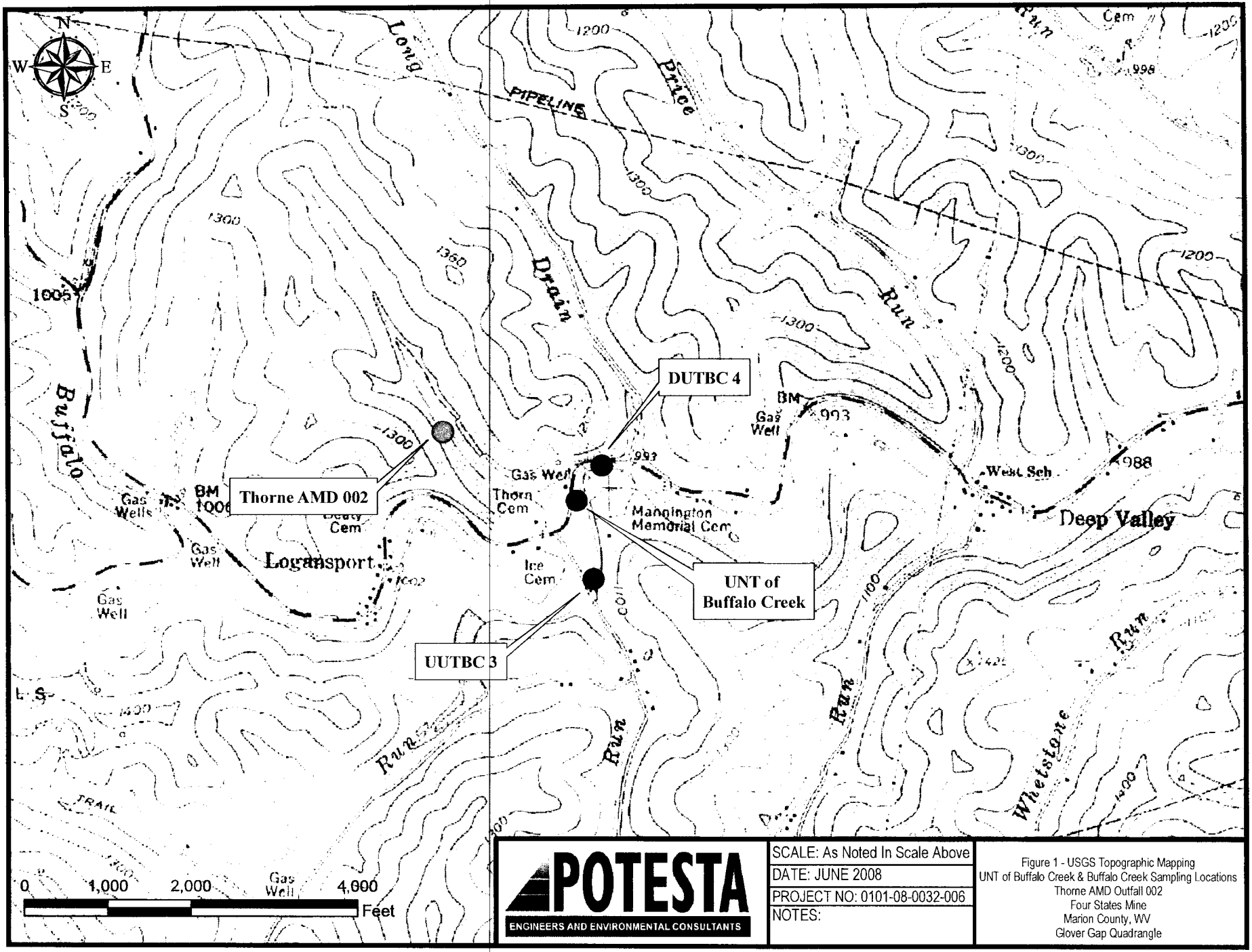
SCALE: As Noted In Scale Above	
DATE: MAY 2008	
PROJECT NO: 0101-08-0032-001	
NOTES:	

Figure 1 - USGS Topographic Mapping
Paw Paw Creek Sampling Locations
Sugar Run TP 001
Loveridge Mine
Marion County, WV
Mannington Quadrangle



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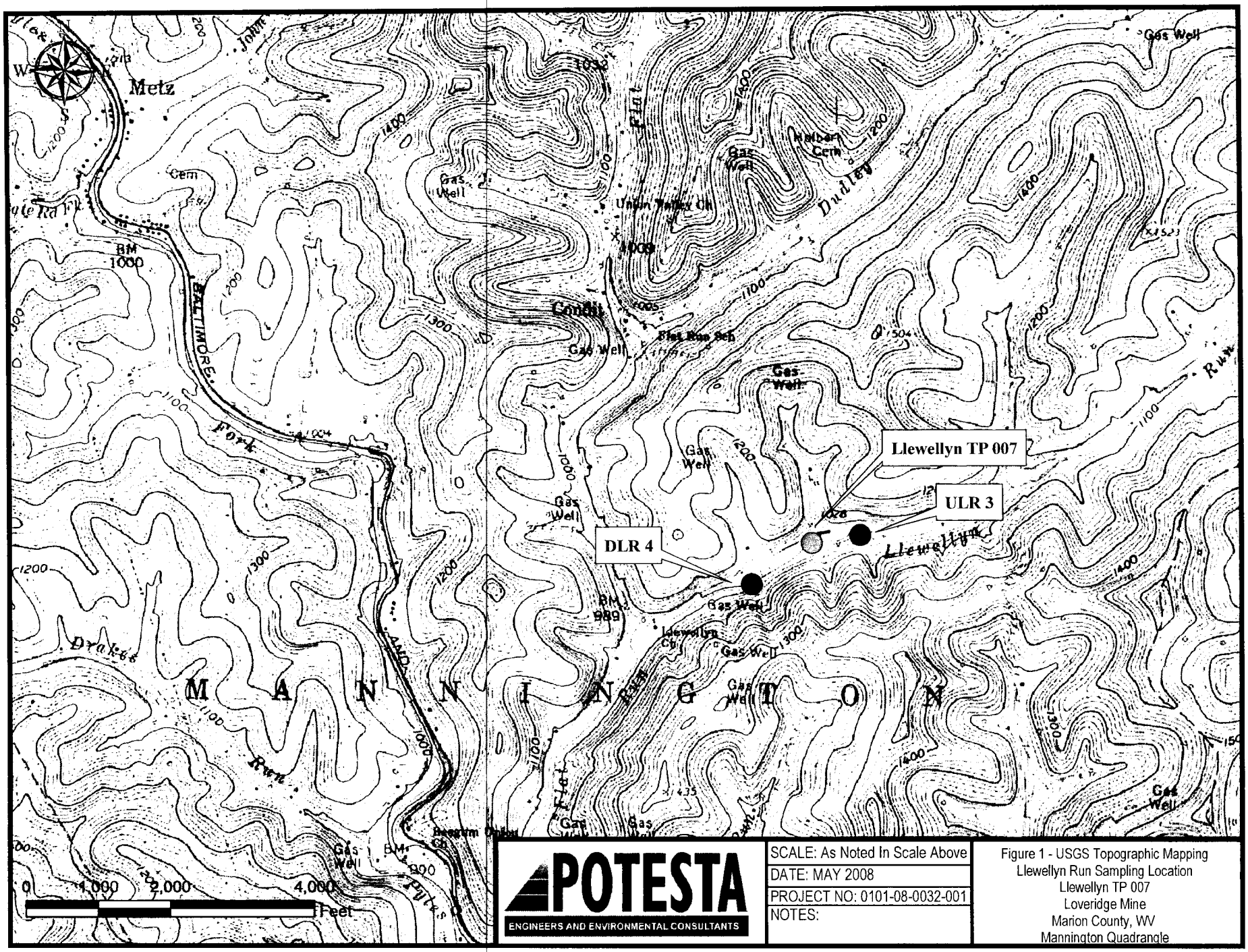
SCALE: As Noted In Scale Above	
DATE: JUNE 2008	
PROJECT NO: 0101-08-0032-006	
NOTES:	

Figure 1 - USGS Topographic Mapping
UNT of Buffalo Creek & Buffalo Creek Sampling Locations
Thorne AMD Outfall 002
Four States Mine
Marion County, WV
Glover Gap Quadrangle



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SCALE: As Noted In Scale Above	Figure 1 - USGS Topographic Mapping Llewellyn Run Sampling Location Llewellyn TP 007 Loveridge Mine Marion County, WV Mannington Quadrangle
DATE: MAY 2008	
PROJECT NO: 0101-08-0032-001	
NOTES:	

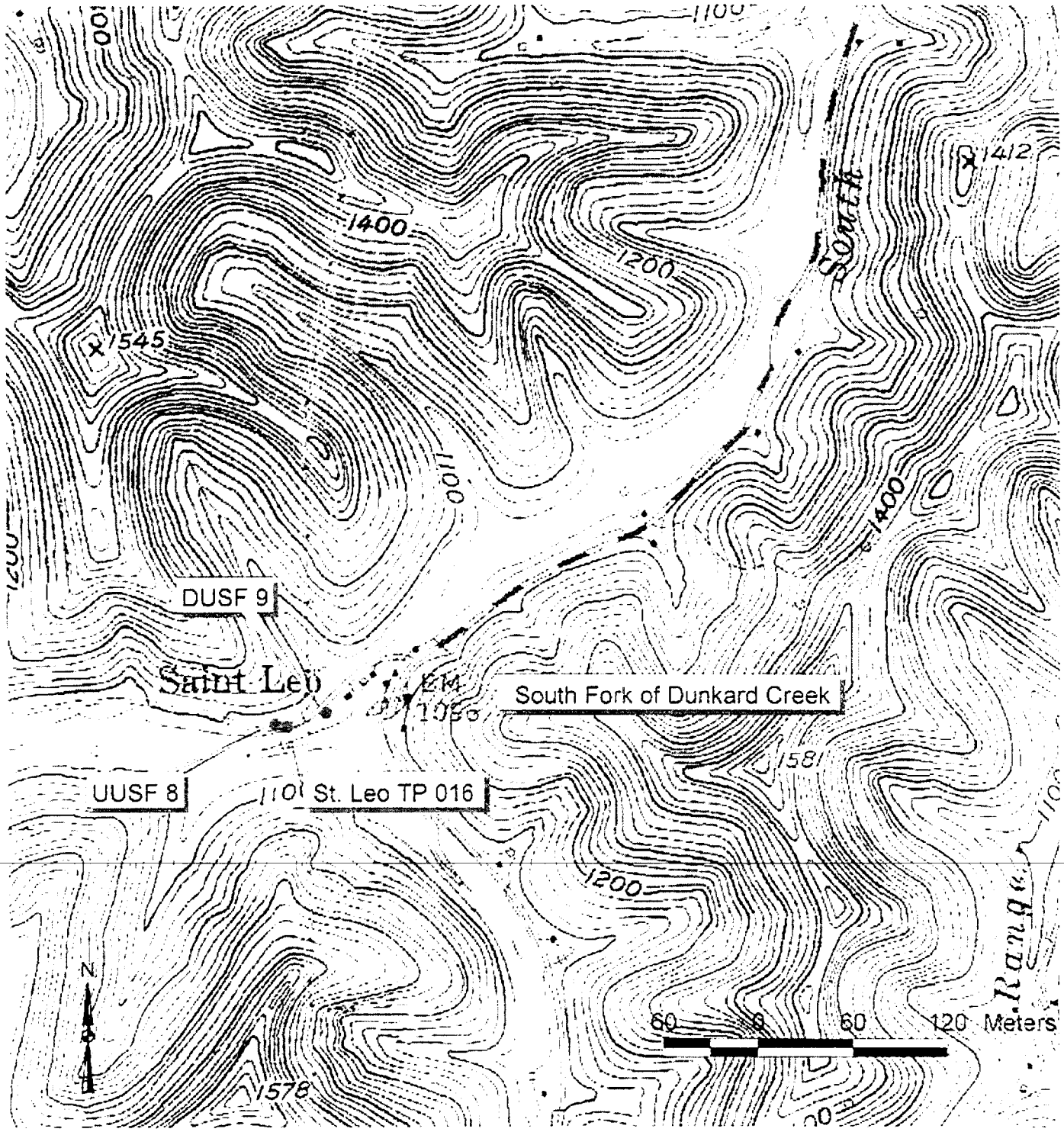

Figure 5. - U.S. Geological Survey 7.5 Minute
Topographic Map
Showing South Fork of Dunkard Creek
Sampling Locations
St. Leo TP 016 at Loveridge Mine
Monongalia County, WV
Wadestown Quadrangle
Project Number: 04-053-005

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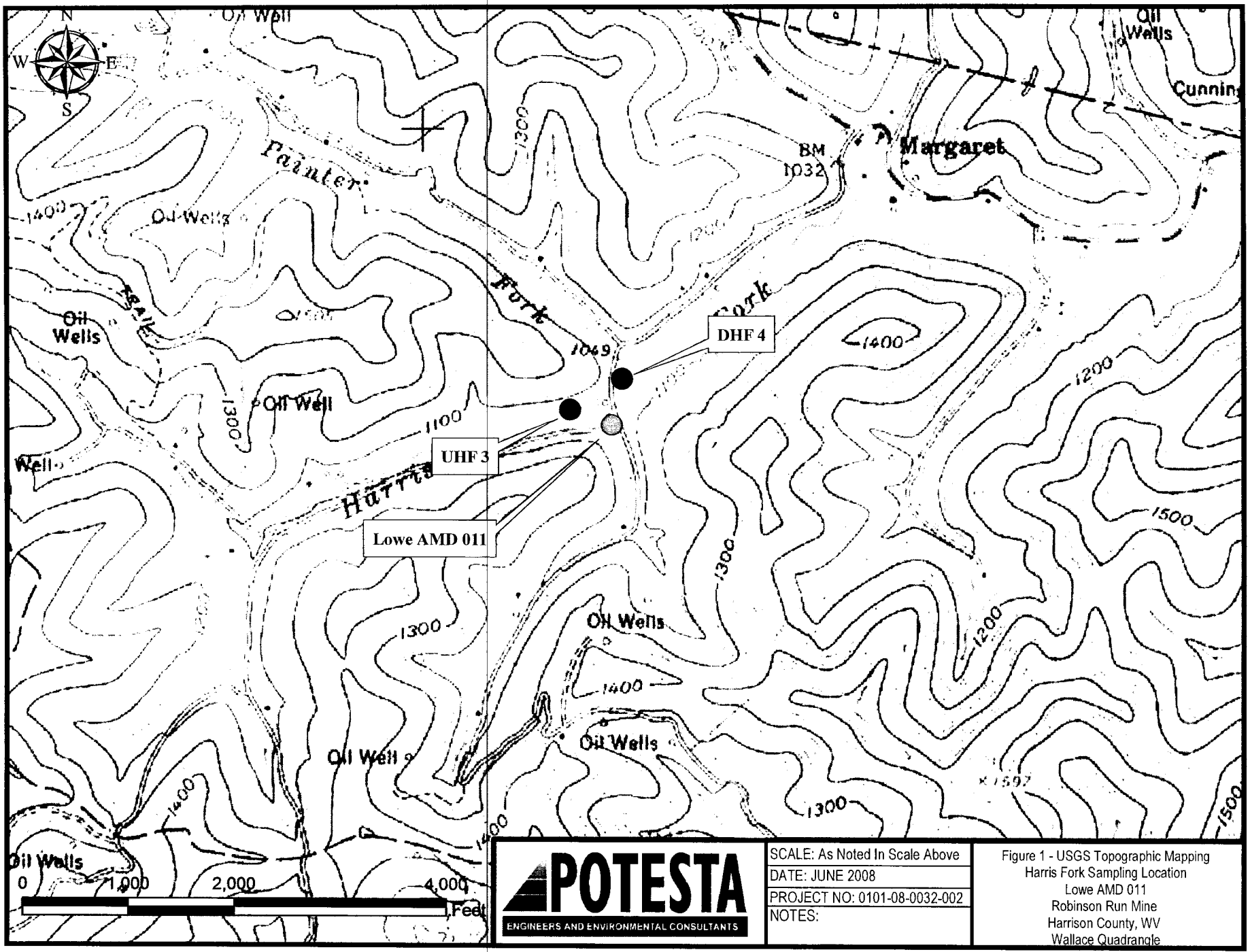

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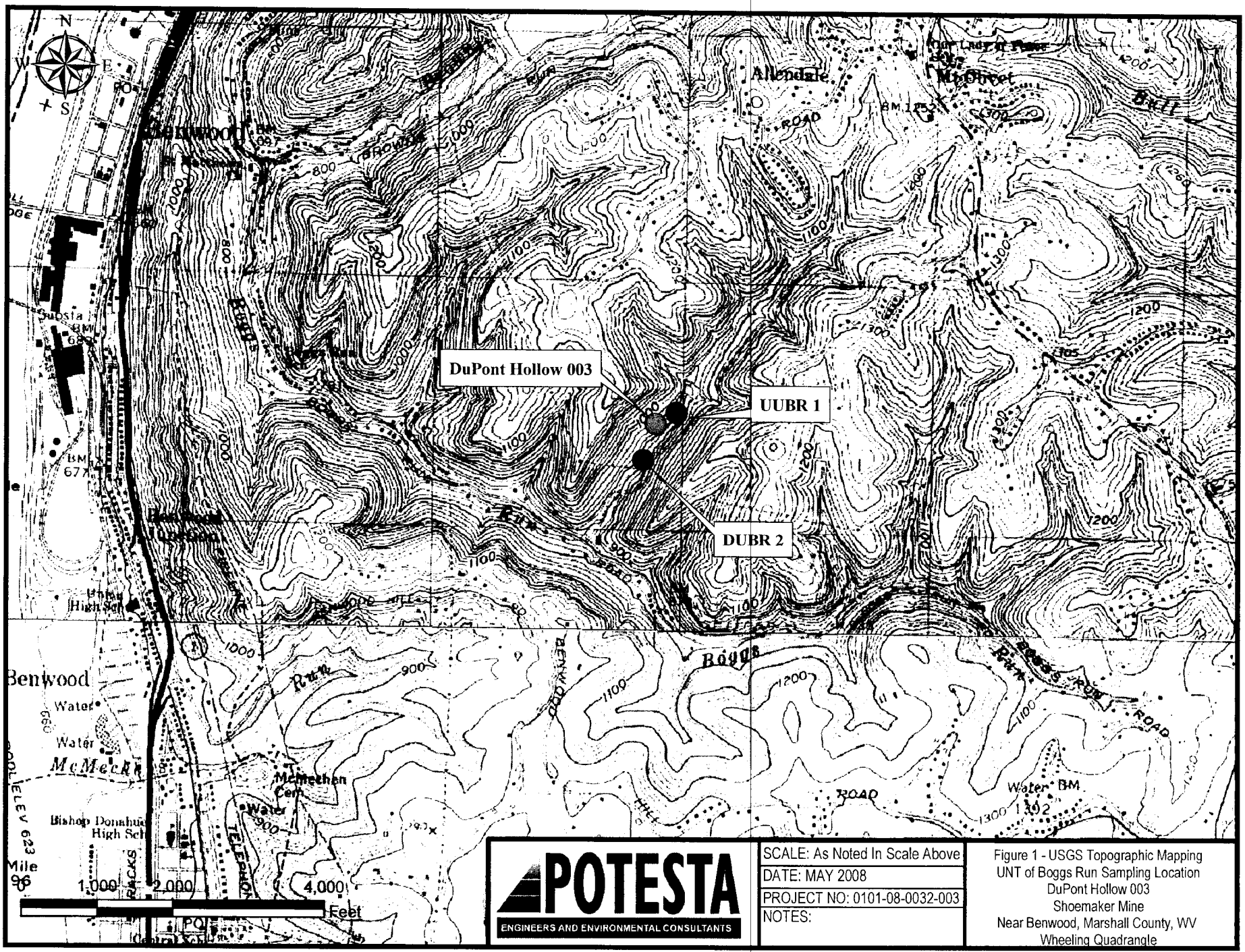
SCALE: As Noted In Scale Above	Figure 1 - USGS Topographic Mapping Harris Fork Sampling Location Lowe AMD 011 Robinson Run Mine Harrison County, WV Wallace Quadrangle
DATE: JUNE 2008	
PROJECT NO: 0101-08-0032-002	
NOTES:	



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SCALE: As Noted In Scale Above	
DATE: MAY 2008	
PROJECT NO: 0101-08-0032-003	
NOTES:	

Figure 1 - USGS Topographic Mapping
UNT of Boggs Run Sampling Location
DuPont Hollow 003
Shoemaker Mine
Near Benwood, Marshall County, WV
Wheeling Quadrangle

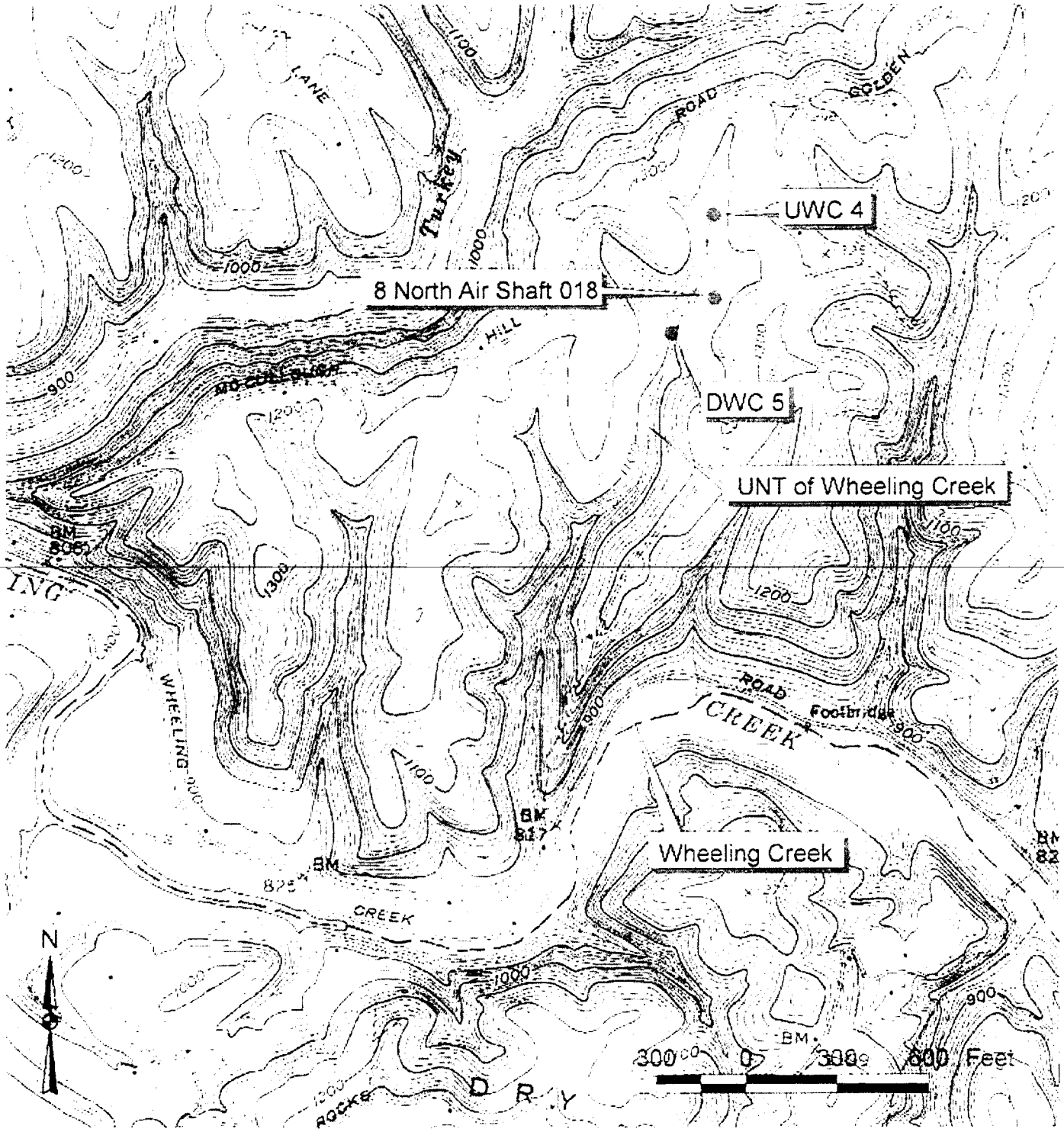

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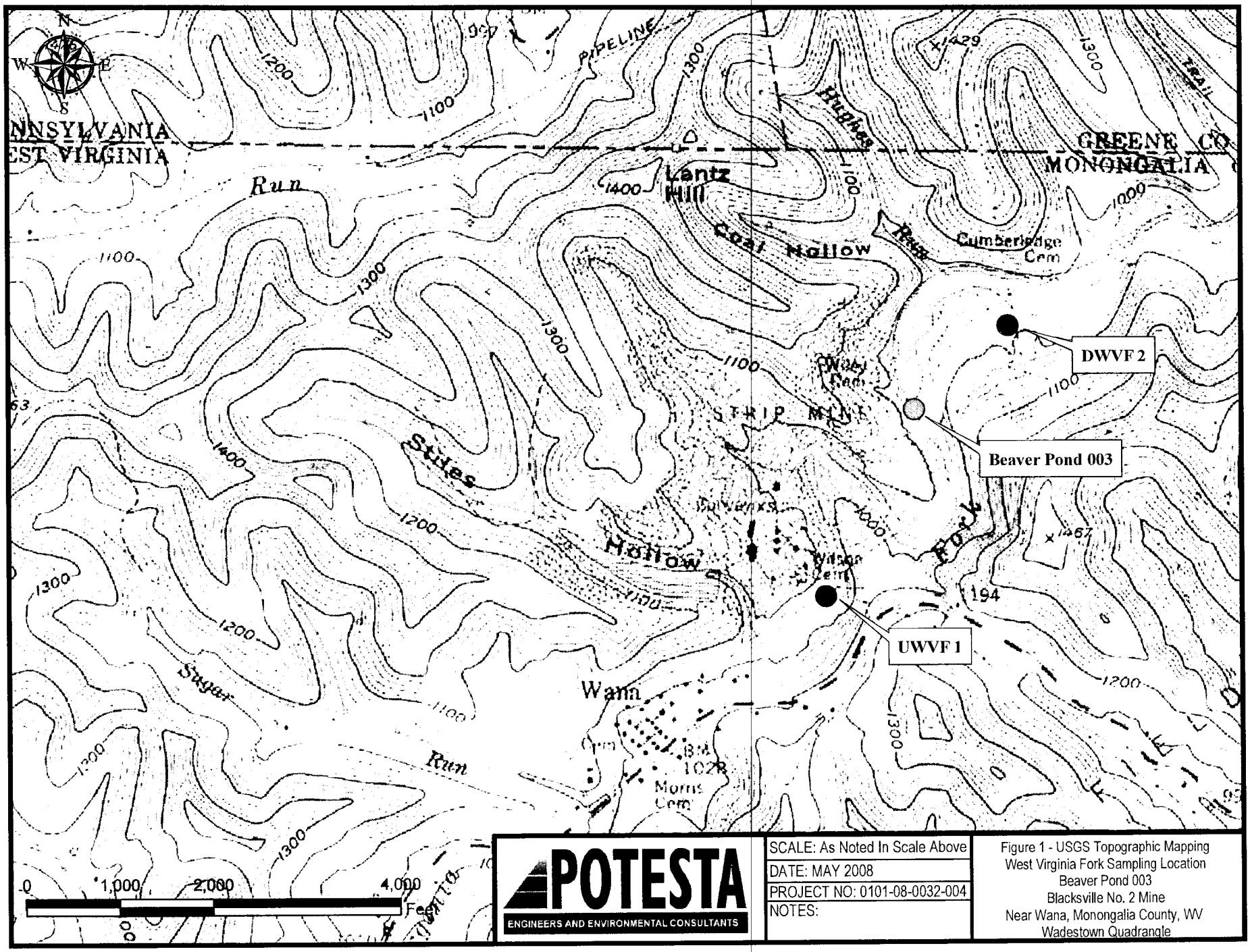
Figure 9. - U.S. Geological Survey 7.5 Minute Topographic Map Showing UNT of Wheeling Creek Sampling Locations
8 North Air Shaft 018 at Shoemaker Mine
Near Benwood, Marshall County, WV
Majorsville Quadrangle
Project Number: 04-053-005



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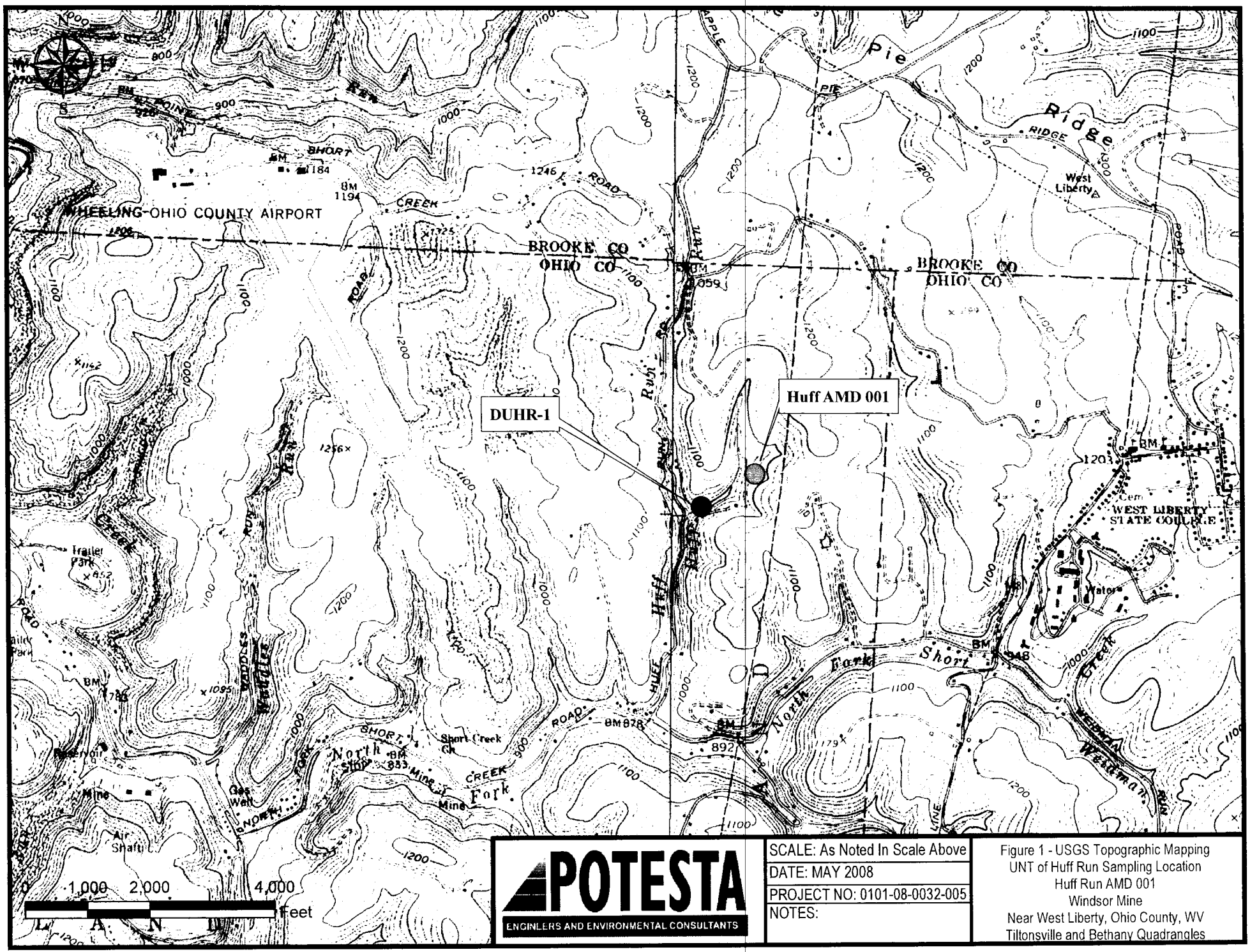
SCALE: As Noted In Scale Above	Figure 1 - USGS Topographic Mapping West Virginia Fork Sampling Location Beaver Pond 003 Blacksville No. 2 Mine Near Wana, Monongalia County, WV Wadestown Quadrangle
DATE: MAY 2008	
PROJECT NO: 0101-08-0032-004	
NOTES:	



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SCALE: As Noted In Scale Above	Figure 1 - USGS Topographic Mapping UNT of Huff Run Sampling Location Huff Run AMD 001 Windsor Mine Near West Liberty, Ohio County, WV Tiltonsville and Bethany Quadrangles
DATE: MAY 2008	
PROJECT NO: 0101-08-0032-005	
NOTES:	