LEO MILLER & ASSOCIATES, INC.

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November 4, 2009

RECEIVED
NOV 09 2009
By

KPDES Branch
Division of Water
200 Fair Oaks Lane
Frankfort, Kentucky 40601

RE: Nally & Hamilton Enterprises, Inc.
DSMRE #807-0348, Amendment #1
Blacklick Branch #1
KPDES Form SDAA

Dear Sir or Madam:

Attached, please find a completed KPDES Form SDAA for Nally & Hamilton Enterprises, Inc. for their permit #807-0348 located in Blacklick Branch in Bell County. Please review the attached application and if there are any questions please contact our office.

Thank you,

Denham York

Denham York
Leo Miller & Associates, Inc.

KPDES FORM SDAA

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NOV 09 2009
By

Kentucky Pollutant Discharge Elimination System (KPDES)

Socioeconomic Demonstration and Alternatives Analysis

The Antidegradation Implementation Procedure found in 401 KAR 10:030, Section 1(3)(b)3 requires KPDES permit applications for new or expanded discharges to waters categorized as "Exceptional or High Quality Waters" to conduct a socioeconomic demonstration and alternatives analysis to justify the necessity of lowering local water quality to accommodate important economic or social development in the area in which the water is located. This demonstration shall include this completed form and copies of any engineering reports, economic feasibility studies, or other supporting documentation

I. Project Information

Facility Name: Nally & Hamilton Enterprises, Inc., DSMRE #807-0348, Amendment #1, Blacklick Branch #1

Location: Blacklick Branch near Oaks, Kentucky	**County: Bell**

Receiving Waters Impacted: Blacklick Creek of Brownies Creek of the Upper Cumberland River

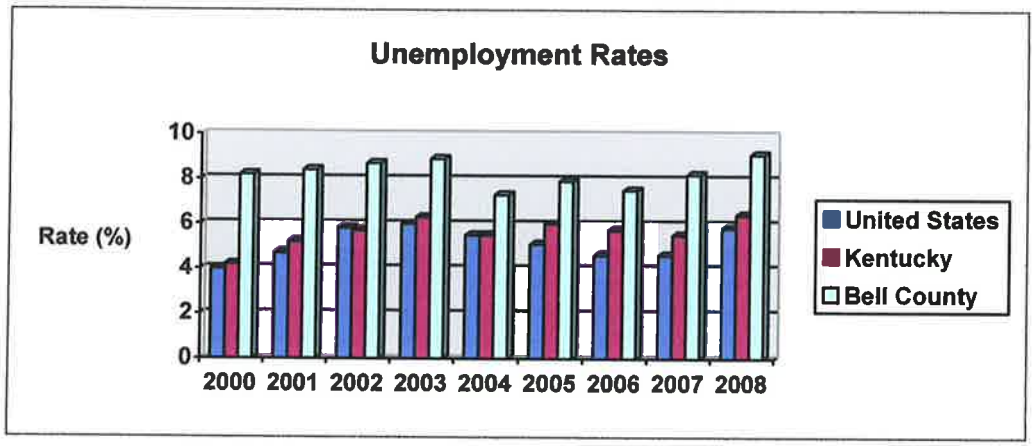
II. Socioeconomic Demonstration

1. Define the boundaries of the affected community:
(Specify the geographic region the proposed project is expected to affect. Include name all cities, towns, and counties. This geographic region must include the proposed receiving water.)

The proposed mining operation is located in southeast Kentucky in Bell County. The operation is located in Blacklick Branch that drains into Brownies Creek and then to the Upper Cumberland River between Harlan, Kentucky and Pineville, Kentucky. The primary cites in Bell County are Pineville and Middlesboro. Smaller named communities closer to the area are Cubbage, Oaks, Miracle, Tejay, Blackmont, Tuggleville, Black Snake, Varilla and Calvin. Counties that border Bell County are Harlan, Leslie, Clay, Knox, and Whitley County, Kentucky. Bell County also borders Claiborne County, Tennessee and Lee County, Virginia.

2. The effect on employment in the affected community:
(Compare current unemployment rates in the affected community to current state and national unemployment rates. Discuss how the proposed project will positively or negatively impact those rates, including quantifying the number of jobs created and/or continued and the quality of those jobs.)

Employment in the local surrounding communities will be directly and indirectly impacted with new employment. These communities Bell County have an unemployment rate that is quite higher than the state and national averages. (See Chart below) This specific project is expected to employ approximately 40 individuals who will aide in lowering the unemployment rate, in an area that lacks employment and business opportunities.



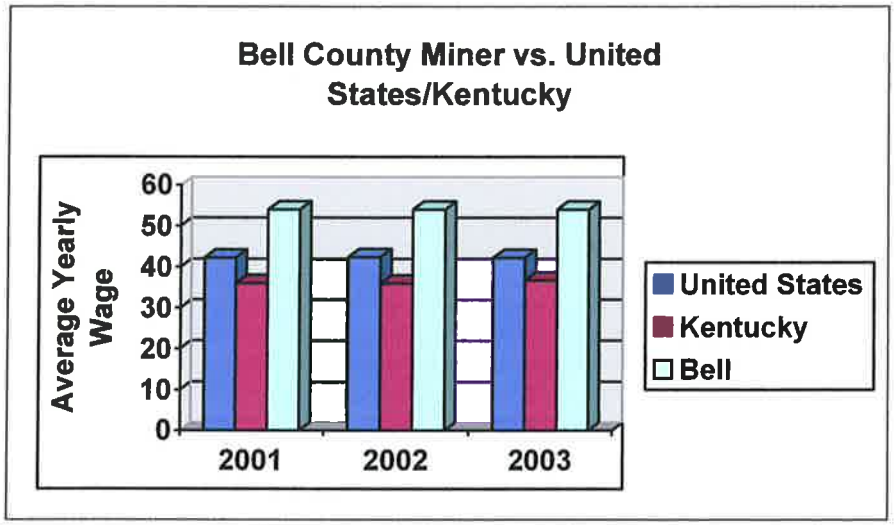
http://www.workforcekentucky.ky.gov/cgi/dataanalysis/AreaSelection.asp?tableName=Labforce

3. The effect on median household income levels in the affected community:
(Compare current median household income levels with projected median household income levels. Discuss how proposed project will positively or negatively impact the median household income in the affected community including the number of households expected to be impacted within the affected community.)

The jobs that this project provides pay some of the highest wages in Bell County. The average miners salary will be approximately $54,000.00 annually. This will obviously have a positive impact on the community's economy. The average earnings rate will rise, causing a more desirably, livable environment.

From 2001-2004, data shows that the average Bell County resident earned almost $15,500.00 per year less than the average Kentucky resident and $20,000.00 per year less than the average U.S. resident. (See chart) [i]

However, during a comparable period, the average Bell County **miner** earned almost $20,200.00 per year more than the average Kentuckian, and nearly $10,900.00 per year more than the average American. (See Chart below) [ii]



4. **The effect on tax revenues of the affected community:**
(Compare current tax revenues of the affected community with the projected increase in tax revenues generated by the proposed project. Discuss the positive and negative social and economic impacts on the affected community by the projected increase.)

Tax revenues generated by the proposed project will increase due in part to increased income tax payments from miner's wages. Locally there will be additional sales tax paid as miners and their families spend their income in local stores businesses. Middlesboro residents pay a 2% occupational tax and Pineville residents pay 1.5%. Increases in property tax assessments usually occur when miners and others that benefit from the mining operation improve their property or expand their businesses. In addition to direct jobs provided by this project, it will also provide indirect employment opportunities, including equipment sales, engineering services, food services, fuel sales, transportation, and other services. During the fiscal year 2006-2007 Bell County generated $5,264,150iii in tax on severed coal with $5,830,791 total tax receipts of which in 2006 coal taxes returned to Bell County was LGEAF $464,490, LGEDF $934,647. (This mining operation is expected to raise an additional $453,600 in severance tax money which is a significant increase for Bell County.) This money is used for local education, health services, and infrastructure projects. The addition of this job will contribute to this tax base.

II. Socioeconomic Demonstration- continued

5. The effect on an existing environmental or public health in affected community:
(Discuss how the proposed project will have a positive or negative impact on an existing environmental or public health.)

Prior surface and underground mining occurred in this area, thus affecting some of the watersheds. However, the area will benefit because once mitigation begins, the stream banks will be stabilized to prevent erosion. Also, species indigenous to the area will be planted and help establish an adequate riparian zone; Stream channels will be rehabilitated to curb sedimentation. This will provide a healthier habitat for aquatic species and wildlife leading to a well balanced ecosystem. It has been calculated that 38 acres of previously disturbed area within the mining area will be rehabilitated. State and federal regulations are being followed so that no problems occur.

6. Discuss any other economic or social benefit to the affected community:
(Discuss any positive or negative impact on the economy of the affected community including direct and or indirect benefits that could occur as a result of the project. Discuss any positive or negative impact on the social benefits to the community including direct and indirect benefits that could occur as a result of the project.)

As stated above, with the additional contribution of taxes that the county will receive from the coal severance taxes, public roads, buildings, and other infrastructures will benefit from this job. This operation is expected to generate $453,600 in additional coal severance tax money.

Also, the work on the haul road will benefit the public. This provides better access to the community, and since the coal operators are repairing the roads, the county monies can be distributed elsewhere. There will be 3,900 feet of either new roads constructed and existing roads repaired and maintained by the mining operation.

The jobs that this project provides pay some of the highest wages in Bell County. The average miners salary will be approximately $54,000.00 annually. This will obviously have a positive impact on the community's economy. The average earnings rate will rise, causing a more desirable, livable environment.

The average weekly earnings for a mining employee in Bell County is $861.67 without overtime. With overtime pay these households may earn approximately $1,125.00 weekly and $54,000.00+- annually. This influx of monies will allow these households the ability to maintain and/or enhance their economic status and the ability to purchase necessities as well as non-necessities and provides opportunities for improved social welfare by being able to provide higher education for their children. The remaining households are benefited when the workforce spends money within the community and that benefits the local economy. As the local economy improves a percentage of this revenue is used to make improvements to businesses, homes and property thereby increasing the market value of taxable property. The creation of permanent roads by mining also raises the value of properties in the area by providing access to areas once inaccessible and that improves property values and impacts households. Therefore, there is a direct benefit to the employees household as well as households within the community thereby creating a positive impact.

III. Alternative Analysis

1. Pollution prevention measures:
(Discuss the pollution prevention measures evaluated including the feasibility of those measures and the cost. Measures to be addressed include but are not limited to changes in processes, source reductions or substitution with less toxic substances. Indicate which measures are to be implemented.)

The first alternative treatment option that was explored was Limestone Sand Dosing. Limestone Sand Dosing is when limestone sand is being added to an acidic stream by a dump truck. The limestone would be distributed downstream by periodic flooding. The sand must be replenished approximately 1 or 2 times per year, depending on flooding frequency. Limestone sand addition is most effective for streams that have low pH, but also relatively low dissolved metal concentrations. Iron and/or aluminum hydroxides precipitate in the stream, but probably over a shorter stretch than without treatment. [iv] This option is available but somewhat unrealistic. As stated, the limestone sand is added by dump trucks. Even with the availability of trucks already on site, one isn't guaranteed this option will work. The site must have truck access to streams at all times. All ponds may not have truck access at all points in time, therefore hindering the use of this option. This is not withstanding the cost to do this option. According to a study, the estimated cost of this project is $200,000 [v] per site. This estimate includes the $350.00/ton of limestone cost, and the cost of sand. The cost per small dump truck is ~$47,500.00, not including maintenance and upkeep. Limestone sand dosing per site is $200,000.00+.

A second option of limestone channeling was also considered. Limestone channel bars are constructed by combining limestone gravel and sand. The limestone gets coated by iron or aluminum hydroxides, but some limestone dissolution still occurs. These methods are most effective for streams that have low pH, but also relatively low dissolved metal concentrations. Iron and/or aluminum hydroxides precipitate in the stream. Again, the cost of installation and upkeep would reach well over $200,000.00 per site. (Including limestone and the cost of dump trucks) This option isn't workable because of the following limitations and obstacles:

1. Limestone does not guarantee a safe result.
2. Limestone is easily coated and is then ineffective.
3. Limestone must be replaced regularly.
4. Limestone is unpredictable. [vi]

A third option would be to construct treatment facilities on or near the site. To transport the discharge to treatment facilities would require multiple lift and pump stations, (which are approximately $200,000.00 each, and it cost approximately *$393,792* per year, per pump to maintain them)[vii] Implementing pump stations at this rate would be exceptionally expensive. With piping cost, estimated at $22/foot, piping for a 5 mile radius would cost over $580,000.00. (5 miles X 5280 ft/mile= 26,400.00 feet. 26,400.00 feet X $22/foot = $580,800.00) After the job is finished, there would be no sewage users, thus the septic system would have to be removed. (The cost for this would also be great.) With a labor rate of ~$25.00 per hour to remove lines, haul garbage, etc, the removal would cost, alone, more than $30,000.00. (4 people working at 4 weeks = 640 hours. 640 hours X $25.00/hour = $16,000.00. $16,000.00 + the cost to remove and dispose of the system = $20,000.00+)

All three options obviously aren't reliable and may impose unsafe conditions, notwithstanding the fact that results on ph, alkalinity and other water tested components are going to fully depend on the limestone actions, therefore being inaccurate.

Because surface mining techniques must be used to maximize the recovery of coal reserves, on site water treatment were considered. Sediment ponds will be used to retain the water for an acceptable amount of time to allow the solids to settle effectively. Silt fences, straw bales and rock check dams can be used on site and in lower elevations where run-off may not flow to a pond. However these devices would not be stable in the steeper areas where strong flows could/ would possibly remove.

2. The use of best management practices to minimize impacts:
(Discuss the consideration and use of best management practices that will assist in minimizing impacts to water quality from the proposed permitted activity.)

Best management practices (BMP"s) will be utilized to assist in minimizing impact to water quality. BMP's will consist of low gradient on-bench diversion ditches capable of trapping sediment before it reaches the primary silt structure. Rock check dams and/or silt fences may be used to trap sediment on site. Silt fences will be utilized where flow velocities are lower and rock check dams will be used in higher flow velocity areas. Rock check dams are always constructed at the toe of hollow fill sites. Straw Bales will also be used to trap silt and reduce flow velocities in areas where they are well suited. Surface disturbance areas will be kept at a minimum and rapid revegetation will be attained when possible. Sensitive areas such as stream riparian zones and other water concentration areas will receive first priority in rapid revegetation efforts. Riprap will be placed as needed in high velocity flow areas to reduce erosion and flow velocities. Mulching will be conducted in conjunction with re-seeding operations. Sensitive areas where water flow conditions exists will be worked during low flow or dry weather when practical. When it is not practical water will be controlled in stabilized channels until the final channel can be constructed. Rough grading will be conducted to increase root penetration and to reduce the length of overland flow paths. Where possible slopes will be returned to lesser grades or shaped in such was as to decrease overland flow and to facilitate infiltration.

3. Recycle or reuse of wastewater, waste by-products, or production materials and fluids:
(Discuss the potential recycle or reuse opportunities evaluated including the feasibility of implementation and the costs. Indicate which of these opportunities are to be implemented)

The water from this job could be used for maintaining dust and for watering of the postmining land, but after evaluating the option, it was found to not be useful because the slope of the land is greater than 10%. With the slope of the land being greater than 10%, the water couldn't be absorbed quickly enough. The effects of this problem would greatly impact the land, and cause economic stress, by possibly causing slides and erosion of soil. Please note that some of the water will be used for dust control. A 5,000 gallon water truck can dispense approximately 5,000 gallons per hour and a maximum of 40,000 gallons per 8 hour day. The three ponds discharge 17,899,260 gallons per hour and 1,298,928,304 gallons per day during a 25 year 24 hour storm. Before mining and on-site treatment the discharge is 27,288,444 gallons per hour and 654,922,649 gallons per day for the same storm event.

A portion of the water can be used during reclamation activities. A 5,000 gallon hydro-seeder can dispense approximately 6 loads per day which is 30,000 gallons per day. The hydro-seeder is used on the average of 17 days during a normal seeding year. Within 17 days 510,000 gallons of water can be utilized. A portion of the water can be used during reclamation but not all water can be utilized. The abundant supply of water is in excess of the amount that can be utilized on the job. This demonstrates that on-site treatment is preferable.

Secondly, we looked at implementing a cistern system as a means of storing the water for reuse. The normal cistern system is estimated to cost approximately $12,000.00/each 5000 gallon tank.[viii] With a generous quote of 500,000 gallon of water per job, one would need at least 100 cistern tanks. Thus, the cost to even establish this option would be $1,200,000.00 ($12,000.00 X 100 tanks).* This estimate does <u>not</u> include the cost of maintaining the cistern system. Maintenance alone is ~$16,233.00 per year/per cistern* It, again, is obvious that this wouldn't be a cost-effective method of water recycling. The cost to contain runoff for just one day for a 25 year 24 hour storm for the entire job site would be 429,582,720 gallons/day divided by 5,000 gallons per cistern is 85,917 cisterns X $12,000 per cistern = $85,917,000.00

III. Alternative Analysis - continued

4. Application of water conversation methods:
(Discuss the potential water conservation opportunities evaluated including the feasibility of implementation and the costs. Indicate which of, of these opportunities are to be implemented)

Water conservation evaluated include diverting surface water away from the proposed mine areas, avoiding loss of water during dry periods, rough grading to enhance water absorption, applying mulch during seeding operations, and establishing vegetative cover to capture and retain moisture.
This operation will construct 5,455 feet of diversion around the deep mine site to prevent surface water from coming into contact with the mine area and 4,705 feet of diversion around the fill area for a total of 10,160 feet of diversion construction for water conservation. At an estimated cost of $70.00 per foot (minimum) to construct a typical natural stream design ditch the total cost to be spent on these diversions is 10,160' X $70.00/foot = $711,200.00. Some estimates to construct these ditches can be double the amount calculated. To avoid reduced stream flow during dry periods impervious liners or materials may be required for some or all of the ditches constructed. The costs of installing liners or providing impermeable materials is estimated at the same rate as diversion construction, i.e., $70.00+ per foot. If all of the ditches are lined this would double the cost to $1,422,400 for this operation. Establishing initial vegetation is estimated to cost at a minimum of $7,268.10 for seedbed preparation (rough grading), $5,251.20 for fertilizer, $31,149.00 for mulch, $3,062.99 for seed, $1,765.11 for lime, $1,308.24 for tree purchase and $6,279.55 for tree planting labor cost. Total cost for initial revegetation efforts is $56,084.19.

5 Alternative or enhanced treatment technology:
(Compare feasibility and costs of proposed treatment with the feasibility and costs of alternative or enhanced treatment technologies that may result in more complete pollutant removal. Describe each candidate technology including the efficiency and reliability in pollutant removal and the capital and operational costs to implement those candidate technologies. Justify the selection of the proposed treatment technology.)

The first alternative treatment option that was explored was Limestone Sand Dosing. Limestone Sand Dosing is when limestone sand is being added to an acidic stream by a dump truck. The limestone would be distributed downstream by periodic flooding. The sand must be replenished approximately 1 or 2 times per year, depending on flooding frequency. Limestone sand addition is most effective for streams that have low pH, but also relatively low dissolved metal concentrations. Iron and/or aluminum hydroxides precipitate in the stream, but probably over a shorter stretch than without treatment. [ix] This option is available but somewhat unrealistic. As stated, the limestone sand is added by dump trucks. Even with the availability of trucks already on site, one isn't guaranteed this option will work. The site must have truck access to streams at all times. All ponds may not have truck access at all points in time, therefore hindering the use of this option. This is not withstanding the cost to do this option. According to a study, the estimated cost of this project is $200,000 [x] per site. This estimate includes the $350.00/ton of limestone cost, and the cost of sand. The cost per small dump truck is ~$47,500.00, not including maintenance and upkeep. Limestone sand dosing per site is $200,000.00+.

A second option of limestone channeling was also considered. Limestone channel bars are constructed by combining limestone gravel and sand. The limestone gets coated by iron or aluminum hydroxides, but some limestone dissolution still occurs. These methods are most effective for streams that have low pH, but also relatively low dissolved metal concentrations. Iron and/or aluminum hydroxides precipitate in the stream. Again, the cost of installation and upkeep would reach well over $200,000.00 per site. (Including limestone and the cost of dump trucks) This option isn't workable because of the following limitations and obstacles:

1. Limestone does not guarantee a safe result.
2. Limestone is easily coated and is then ineffective.
3. Limestone must be replaced regularly.
4. Limestone is unpredictable. [xi]

A third option would be to construct treatment facilities on or near the site. To transport the discharge to treatment facilities would require multiple lift and pump stations, (which are approximately $200,000.00 each, and it cost approximately *$393,792* per year, per pump to maintain them)[xii] Implementing pump stations at this rate would be exceptionally expensive. With piping cost, estimated at $22/foot, piping for a 5 mile radius would cost over $580,000.00. (5 miles X 5280 ft/mile= 26,400.00 feet. 26,400.00 feet X $22/foot = $580,800.00) After the job is finished, there would be no sewage users, thus the septic system would have to be removed. (The cost for this would also be great.) With a labor rate of ~$25.00 per hour to remove lines, haul garbage, etc, the removal would cost, alone, more than $30,000.00. (4 people working at 4 weeks = 640 hours. 640 hours X $25.00/hour = $16,000.00. $16,000.00 + the cost to remove and dispose of the system = $20,000.00+)

All three options obviously aren't reliable and may impose unsafe conditions, notwithstanding the fact that results on ph, alkalinity and other water tested components are going to fully depend on the limestone actions, therefore being inaccurate.

Because surface mining techniques must be used to maximize the recovery of coal reserves, on site water treatment were considered. Sediment ponds will be used to retain the water for an acceptable amount of time to allow the solids to settle effectively. Silt fences, straw bales and rock check dams can be used on site and in lower elevations where run-off may not flow to a pond. However these devices would not be stable in the steeper areas where strong flows could/ would possibly remove.

III. Alternative Analysis - continued

6. Improved operation and maintenance of existing treatment systems:
(Discuss improvements in the operation and maintenance of any available existing treatment system that could accept the wastewater. Compare the feasibility and costs of improving an existing system with the feasibility and cost of the proposed treatment system.)

The closest water treatment facility to the operation (Latitude 36-45-47/Longitude 83-48-33) is the Barbourville Utilities wastewater treatment facility in Knox County (Latitude 36.84833/Longitude 83.905). The wastewater treatment facility is approximately 35 miles from the operation. To effectively transport the discharge to this facility it would require lift and pump stations. The pump stations cost approximately $200,000.00 each and approximately $393,792.00 per year to pump and maintain them. Implementing pump stations at this rate would be exceptionally expensive. With piping cost estimated at $22/foot, alone would cost over $4M. (35 miles X 5,280 ft/mile = 184,800 ft. X $22/foot = $4,065,600.

Trucking Cost: It has been calculated that during mining discharge during a 25 year 24 hour storm is 17,899,280 gallons/hour and 429,582,720 gallons/day. One truck with a 10,000 gallon capacity would cost $355.25 per trip to transport storm water to the Barbourville Municipal Treatment plant. One truck could make 8 trips per 24 hour time period. 8 trips/day X $355.25 = $2,842.00 per truck per day. 8 trips/day per truck X 10,000 gallons/truck = 80,000 gallons per truck per day. 429,582,720 gallons/day divided by 80,000 gallons/truck = 5,370 trucks/day required to transport the water. 5,370 trucks/day X $2,842.00 per truck = $15,261,540 per day to transport the water by truck. 5,370 trucks would occupy approximately 30.51 miles of roadway with no spaces between trucks which is nearly the distance to the treatment plant. The trucks would create a safety problem on the narrow, crooked public road if there was any room for the public on the roads. There is no place in the county to park 5,370 trucks or any fraction thereof when they are not needed and there are a lack of maintenance facilities and a shortage of drivers for the trucks. In order to truck the water storage ponds would need to be built on site to hold the water until it could be transported. There is insufficient space in this area to construct the size ponds needed.

Barbourville Treatment Plant: The Barbourville treatment plant is a biological plant designed to treat raw sewage. In order to accommodate and treat storm water for sediment control the plant would be required to construct the same types of sediment ponds that are proposed for the mining operation. 429,582,720 gallons per day would require a 66 acre pond 20 feet deep to store the storm runoff for one day. The entire city of Barbourville is 3.5 square miles and most of the gently sloping land is occupied. The population density is 1,027.4 people per square mile so there is no place to build a 66 acre reservoir in Barbourville. The Surface Mining Control and Reclamation Act of 1977 does not allow for water to be removed from the watershed. Hydrologic balance must be maintained.

7. Seasonal or controlled discharge options:
(Discuss the potential of retaining generated wastewaters for controlled releases under optimal conditions, i.e. during periods when the receiving water has greater assimilative capacity. Compare the feasibility and cost of such a management technique with the feasibility and cost of the proposed treatment system.)

Retaining stormwaters for controlled releases under optimal conditions when receiving streams have a greater assimilative capacity would require the construction of large impoundments capable of holding stormwaters an indefinite period of time until optimal conditions existed. A 25 year 24 hour storm for this small operation generates 429,582,720 gallons per day of stromwater. To hold this water for one day would require a 66 acre pond 20 feet deep to store the storm runoff. To hold the water two days would require a 132 acre pond the same depth or a 66 acre pond 40 feet deep. Each additional day needed to hold the stormwater would double the size of the impoundment. To construct a facility this size can only be accomplished by government with the power of eminent domain to purchase and condemn the large amount of property needed to construct such a facility. Impoundments this size require years of environmental studies and costs hundreds of millions of dollars to construct. The size of the impoundment would far exceed the size of the mining operation.

The current treatment facilities cost from $40,000.00 to $50,000.00 to construct. This operation has three proposed treatment facilities with a maximum construction cost of $150,000.00. The property these structures are located on are already under lease and all required studies have been completed. The proposed treatment facilities can be reclaimed for a fraction of the cost with the areas returned to their pre-mining configuration and function.

The Surface Mining Control and Reclamation Act of 1977 requires that the hydrologic balance be maintained within the operational area.

III. Alternative Analysis - continued

8 Land application or infiltration or disposal via an Underground Injection Control Well
(Discuss the potential of utilizing a spray field or an Underground Injection Control Well for shallow or deep well disposal. Compare the feasibility and costs of such treatment techniques with the feasibility and costs of .proposed treatment system.)

A 24-inch outside diameter carrier casing is the largest size currently used for deep well injection. A 24-inch well can dispose of 10,400 gpm or 15.02 mgd. It would take approximately 29 wells to inject the runoff from a 25 year 24 hour storm event of 429,582,720 gpd. The cost for each injection wells is $2,500,000.00, pumping station $412,500.00, site improvements & miscellaneous $25,000.00 and contingencies and engineering, 20%, $587,500.00. Total = $3,525,000.00 per well. Total costs for 29 wells = $102,225,000.00. Routine maintenance for 276 pumping days is $37,500.00, power costs is $121,300.00; total = $158,800.00 X 29 = $4,605,200.00. $102,225,000.00 + $4,605,200.00 = $106,830,200.00 total costs for all 29 wells for the first year. Annualized capital cost was not calculated.

The costs for constructing three proposed on-site ponds at approximately $50,000.00 per pond is $150,000.00. Annual maintenance for each pond is a maximum of $5,000.00 per pond with a total of $15,000.00 per year. Total cost as proposed is $150,000.00 + $15,000.00 = $165,000.00 for the first year compared to $106,830,200.00 for injection wells. After the first year the costs for pond maintenance is $15,000.00 per year while the costs for the injection wells is $4,605,200.00 xiii

9 Discharge to other treatment systems
(Discuss the availability of either public or private treatments systems with sufficient hydrologic capacity and sophistication to treat the wastewaters generated by this project. Compare the feasibility and costs of such options with the feasibility and costs of the proposed treatment system.)

See attached page.

IV Certification: I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name and Title:	**Stephen Hamilton, Secretary/Treasurer**	**Telephone No.:**	(502)348-0084
Signature:		**Date:**	**11-02-2009**

III. Alternative Analysis - continued

8 Land application or infiltration or disposal via an Underground Injection Control Well
(Discuss the potential of utilizing a spray field or an Underground Injection Control Well for shallow or deep well disposal. Compare the feasibility and costs of such treatment techniques with the feasibility and costs of proposed treatment system.)

A 24-inch outside diameter carrier casing is the largest size currently used for deep well injection. A 24-inch well can dispose of 10,400 gpm or 15.02 mgd. It would take approximately 29 wells to inject the runoff from a 25 year 24 hour storm event of 429,582,720 gpd. The cost for each injection wells is $2,500,000.00, pumping station $412,500.00, site improvements & miscellaneous $25,000.00 and contingencies and engineering, 20%, $587,500.00. Total = $3,525,000.00 per well. Total costs for 29 wells = $102,225,000.00. Routine maintenance for 276 pumping days is $37,500.00, power costs is $121,300.00; total = $158,800.00 X 29 = $4,605,200.00. $102,225,000.00 + $4,605,200.00 = $106,830,200.00 total costs for all 29 wells for the first year. Annualized capital cost was not calculated.

The costs for constructing three proposed on-site ponds at approximately $50,000.00 per pond is $150,000.00. Annual maintenance for each pond is a maximum of $5,000.00 per pond with a total of $15,000.00 per year. Total cost as proposed is $150,000.00 + $15,000.00 = $165,000.00 for the first year compared to $106,830,200.00 for injection wells. After the first year the costs for pond maintenance is $15,000.00 per year while the costs for the injection wells is $4,605,200.00 xiii

9 Discharge to other treatment systems
(Discuss the availability of either public or private treatments systems with sufficient hydrologic capacity and sophistication to treat the wastewaters generated by this project. Compare the feasibility and costs of such options with the feasibility and costs of the proposed treatment system.)

See attached page.

IV Certification: I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name and Title:	**Stephen Hamilton, Secretary/Treasurer**	**Telephone No.:**	**(502)348-0084**
Signature:	Stephen Hamilton	**Date:**	**11-02-2009**

Section III.

9. Discharge to other treatment systems

The closest water treatment facility to the operation (Latitude 36-45-47/Longitude 83-48-33) is the Barbourville Utilities wastewater treatment facility in Knox County (Latitude 36.84833/Longitude 83.905). The wastewater treatment facility is approximately 34 miles from the operation. To effectively transport the discharge to this facility it would require lift and pump stations. The pump stations cost approximately $200,000.00 each and approximately $393,792.00 per year to pump and maintain them. Implementing pump stations at this rate would be exceptionally expensive. With piping cost estimated at $22/foot, alone would cost over $4M. (34 miles X 5,280 ft/mile = 179,520 ft. X $22/foot = $3,949,440.00.

Trucking Cost: It has been calculated that during mining discharge during a 25 year 24 hour storm is 17,899,290 gallons/hour and 429,582,720 gallons/day. One truck with a 10,000 gallon capacity would cost $355.25 per trip to transport storm water to the Barbourville Municipal Treatment plant. One truck could make 8 trips per 24 hour time period. 8 trips/day X $355.25 = $2,842.00 per truck per day. 8 trips/day per truck X 10,000 gallons/truck = 80,000 gallons per truck per day. 429,582,720 gallons/day divided by 80,000 gallons/truck = 5,370 trucks/day required to transport the water. 5,370 trucks/day X $2,842.00 per truck = $15,261,540.00 per day to transport the water by truck. 5,370 trucks would occupy approximately 30.51 miles of roadway with no spaces between trucks which about the distance to the treatment plant. The trucks would create a safety problem on the narrow, crooked public road if there was any room for the public on the roads. There is no place in the county to park 5,370 trucks or any fraction thereof when they are not needed and there are a lack of maintenance facilities and a shortage of drivers for the trucks. In order to truck the water storage ponds would need to be built on site to hold the water until it could be transported. There is insufficient space in this area to construct the size ponds needed.

Barbourville Treatment Plant: The Barbourville treatment plant is a biological plant designed to treat raw sewage. In order to accommodate and treat storm water for sediment control the plant would be required to construct the same types of sediment ponds that are proposed for the mining operation. 429,582,720 gallons per day would require a 66 acre pond 20 feet deep to store the storm runoff for one day. The entire city of Barbourville is 3.5 square miles and most of the gently sloping land is occupied. The population density is 1,027.4 people per square mile so there is no place to build a 66 acre reservoir in Barbourville. The Surface Mining Control and Reclamation Act of 1977 does not allow for water to be removed from the watershed. Hydrologic balance must be maintained.

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[i] http://www.workforcekentucky.ky.gov/cgi/dataanalysis/incomeReport.asp?menuchoice=income

[ii] http://www.coaleducation.org/Ky_Coal_Facts/Default.htm

[iii] **Expanded Online Kentucky Coal Facts, http://www.coaleducation.org/Ky_Coal_Facts/Default.htm**

[iv] Acid Mine Drainage Treatment Plans
http://www.facstaff.bucknell.edu/kirby/AMDtrmt.html

[v] http://www.epa.gov/owow/nps/Success319/state/ky.htm#results

[vi] **Limestone Treatment of Acid Waste**
A white paper by Wastech Controls & Engineering, Inc.,
http://www.wastechengineering.com/papers/limestone.htm

[vii] Estimate derived from:
http://www.pumpingmachinery.com/pump_magazine/pump_articles/article_33/PS%20paper%20November%2010%202004.doc

Pump Operation Costs as a Function of Operating Flow in Wastewater Treatment
Case Study
Dr. Lev Nelik, P.E., APICS
Pumping Machinery, LLC

[viii] [4] Kessner, K., 2000: How to Build a Rainwater Catchment Cistern. The March Hare, Summer 2000, Issue 25, (http://www.dancingrabbit.org/newsletter/)

[ix] Acid Mine Drainage Treatment Plans
http://www.facstaff.bucknell.edu/kirby/AMDtrmt.html

[x] http://www.epa.gov/owow/nps/Success319/state/ky.htm#results

[xi] **Limestone Treatment of Acid Waste**
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[xii] Estimate derived from:
http://www.pumpingmachinery.com/pump_magazine/pump_articles/article_33/PS%20paper%20November%2010%202004.doc

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Pumping Machinery, LLC

xiii http://library.fgu.edu/caloos4v2pt6.pdf Deep Well Injection
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