**Release Statement:** I certify that the information provided in this 2013 Excellence Award application is accurate and correct to the best of my knowledge. I understand that nominations become the property of SWANA. SWANA reserves the right to publish any or all of my application. My signature gives SWANA the right to reprint or make available for purchase any portion of this application.

**Printed Name of Representative:** Scot C. Sample, Executive Director

**Organization Name:** Northern Tier Solid Waste Authority

**Signature:**

**Date:** May 16, 2013
NORTHERN TIER SOLID WASTE AUTHORITY

LANDFILL GAS UTILIZATION

2013 EXCELLENCE AWARD APPLICATION
The Northern Tier Solid Waste Authority (NTSWA) is a small, very rural, three county, integrated solid waste authority located in North Central Pennsylvania. The Authority was formed in 1973 by the three counties of Bradford, Sullivan and Tioga. NTSWA thrived for nearly four decades under the leadership of David Terrill who lost a battle to cancer in 2011. The concept to harness the exhaust waste heat from the Caterpillar 3520 engine came from Terrill himself. NTSWA has been utilizing landfill gas to operate a CAT engine for over 12 years and has been utilizing waste heat from the cooling jacket since 2008. On behalf of the Thermal Heat Recovery Project or “Heat Loop Project”, NTSWA has taken it one step further and decided to tap into the Cat 3520 exhaust system. The heat from the exhaust is directed into a 3.28 Million BTU heat exchanger. Heated water is transported approximately 1,600 feet to the adjoining County facilities where it supplies domestic hot water and is their main source of heat.

The Northern Tier Solid Waste Authority submits this application in memory of former Executive Director, David T. Terrill. Without his determination and foresight the Authority would not be where it is today.
The drive behind the project was the use of the tremendous amount of heat being wasted or under utilized from the Authority’s electric generating facility.

After utilizing hot water from the engine’s cooling jacket to supply heat to our leachate treatment facility, our 9,600 square foot truck garage and our 14,400 square foot hydroponic greenhouse, NTSWA still had more energy to recover.

The heat loop project was able to use the exhaust waste heat from the CAT 3520 Engine to heat water that is transported to both the Bradford County Manor and the Bradford County Correctional Facility. This water provides both domestic hot water as well as supplies heat to these facilities.

Former Executive Director, David Terrill who always had a vision of a future powered by renewable energy sources, was the driving force behind the entire project.

NTSWA, Landfill #2 is located on a 128 acre tract of property and is landlocked by US Route 6 to the south, County property and The Bradford County Manor and Correctional Facility to the east, Mill Creek to the north and State Gamelands to the west. Fifty-four acres of the site is consumed by the landfill footprint and support facili-
ties consume another 30-acres. The location of The Bradford County Manor and Correctional Facility made an ideal fit for this project.

Terrill approached the Bradford County Manor with the idea of harnessing the exhaust waste heat and in turn transferring this energy to both County facilities. After the County was on board, Michael Norris, of Michael L. Norris & Associates, Inc. was hired as the engineer for the project. His knowledge and expertise made this vision a reality. Norris did an excellent job in handling all of the specifications and equipment needed to make this system operational.

To prepare the site for installation earth moving operations needed to be completed. NTSWA forces prepared the groundwork for the pipe to be placed by excavating a trench that ran from NTSWA’s heat exchanger and connected with the County’s piping system. Insulated pipe was welded together in 40 foot sections and additionally insulated at each joint to minimize heat loss during the transport of the thermal energy. To avoid air locks from forming in the pipes, the system was designed to attain a constant slope in the pipe layout. This was achievable due to the geographical location of NTSWA’s site compared to the County facilities. The site soils met the needs for the project.

The project was designed in three phases. Phase one consisted of installing the heat exchanger. The heat exchanger is the mechanism that transfers the exhaust heat to the water. Pipe installation from the heat exchanger to the pump house and the construction of the pump house were also included in phase one of the project. Phase one took approximately 8 months to complete.

Phase two involved pipe installation from the pump house to the Bradford County Manor. The Bradford County Manor is located on the opposite side of Route 6, which is traveled heavily by trucks associated with the gas well drilling industry. Diverting traffic to make a cut in the road, lay pipe, refill the hole and patch the road was out of the question, so the only option was to bore underneath.
Finally, Phase three involved the installation of pipe from the pump house to the correctional facility. The pump house which is located on the property of the Correctional Facility was only a short distance.

The entire project from Phase 1 to 3 took approximately one year to complete.

Due to the simplicity of the Thermal Heat Recovery Project, environmental hazards were nonexistent. The insulated pipe was buried a minimum of 4 feet underground. This eliminated the need to use chemicals, such as glycol, to prevent the water from freezing.

NTSWA’s ability to provide an end use heat source originating from the waste of Bradford, Tioga and Sullivan Counties makes this a “State of the Art” operation.

This project is possible due to the waste exhaust heat from PPL’s CAT3520 reciprocating engine. The exhaust heat exits the engine where it is captured by our 3.28 million BTU heat exchanger. Water is then heated and transported 800 feet to our pump house. The pump house is the central location for the transported water. Hot water from the engine enters the pump house where it passes through another heat exchanger and then travels another 800 feet supplying hot water to both the county facilities. Once entering these facilities, it will then pass through an additional heat exchanger which in turn, will heat the water to these facilities. This “State of the Art” operation supplies both heat and domestic hot water to a combined 407 occupant Nursing Home and Correctional Facility.
Since the landfill was initially constructed in 1983, there has been no groundwater degradation. There are twelve (12) groundwater monitoring wells that are sampled and tested each quarter and the results are forwarded to Pennsylvania DEP for review. NTSWA utilizes an artesian well on-site which is the water supply source for the heat loop project. If for any reason water would leak or run low, this artesian well is designed to automatically replenish the system.

NTSWA monitors seven gas probes located around the perimeter of the landfill. By monitoring these probes, NTSWA is able to detect migrating gas that has escaped from the landfill. These gas probes are monitored quarterly with the data being forwarded to Pennsylvania DEP. Surface emissions from the landfill are also monitored on a quarterly basis.

NTSWA’s landfill gas system consists of 81 landfill wells, a collection system, blower skid (to pull a vacuum on the wellfield), CAT 3520 engine, generator and controls. The engine runs on an average of 450 scfm at approximately 50% methane. An enclosed flare is utilized when the engine is down for maintenance.

Leachate is captured via a collection system and three (3) pump stations. The leachate is pumped into a 2.4 million gallon concrete leachate storage tank. From there it is pumped to the leachate treatment facility. Upon entering the leachate treatment facility, the leachate enters a Sequencing Batch Reactor (SBR) system. This is where digestion of biological organisms breaks down the organic material present and where metals are removed. From there leachate goes through a flow meter before being discharged to the Bradford County Waste Water Treatment Plant (BCWWTP). The BCWWTP provides secondary treatment and holds the National Pollutant Discharge Elimination System (NPDES) permit for discharge to Sugar Creek.

With the installation of the landfill gas system, NTSWA is able to reduce the greenhouse gas emissions and provide benefits to the environment by reducing methane emissions. In 2012, NTSWA combusted a total of 2,537 metric tons of methane. This is equivalent to removing 10,069 passenger vehicles from the highway or eliminating emissions caused by electric use from 7,235 homes.

By utilizing exhaust waste heat from the landfill gas engine the NTSWA is using a valuable resource, which would otherwise be wasted. Generating electricity from the decomposing waste helps incorporate energy conservation into the overall management plan.
The Northern Tier Solid Waste Authority (NTSWA) is an Integrated Solid Waste System committed to the excellence in solid waste management in the Pennsylvania counties of Bradford, Tioga and Sullivan. The Authority provides the following services to the community:

- Waste Disposal
- Recycling
- Tire Shredding
- Wood Grinding (mulch)
- Septage Receiving
- Street Sweeping
- Leaf Vacuum
- Waste Transportation
- Electric Generation
- Spring and Fall Cleanups for Participating Municipalities
- Educational Services
- Hydroponically grown greens

The Authority is made up of three (3) representatives from each of the three (3) counties. The commitment from these individuals is deeply appreciated and unsurpassed. NTSWA is recognizing two (2) of their members this year for 40 years of service. These two members of the Board have been with the Authority since it was chartered in 1973. Another three of the members have over 30 years of service with three more having over 20 years of dedicated service to the Authority.

NTSWA provides numerous educational programs and tours through the schools and local civic organizations. In 2012, the Authority provided $5,000.00 in scholarship funds to seniors pursuing an environmental education from an accredited college or university. To date, NTSWA has given away over $62,000 in scholarships.
NTSWA’s staff ensures the facility is in compliance with local, state and federal regulations. NTSWA received no violations in 2012.

NTSWA’s safety program is second to none. Monthly safety meetings discuss various topics relative to the solid waste industry. NTSWA’s safety program pays out a safety bonus to each employee at the end of the year, dependent upon the number and degree of safety violations encountered. NTSWA has been recognized for seven consecutive years as a Peak Performer in Risk Management by our insurance carrier, Penn Prime Insurance Trust.

In 2008, NTSWA received a $70,000.00 grant from the Growing Greener Energy Harvest Program for the construction of our 14,400 square foot greenhouse.
NTSWA and Bradford County developed a unique program to ensure compliant and aggressive performance of the facility. The simple operating contract consists of a 50/50 split on all costs and all savings. The Agreement is straightforward and fair to both parties. We simply take the base year cost prior to the project and subtract the current year cost to heat the facility. The difference between the base year cost and current year cost would equal the savings which is then split between NTSWA and the County.

The cost of the project equaled $597,717.61, which was split equally between NTSWA and the County. Not included in the price was the bore underneath Route 6. This was paid for by the County and cost $37,420.00.

When Terrill approached the County with his idea, the price of natural gas was at a much higher rate than at present time. From 2005 through 2007, the County spent a total of $561,805.12 on their natural gas supply. That is an average of $187,267.37 per year. Since then, natural gas prices have plummeted which has in turn created much less in savings. Although the price of natural gas has fallen so drastically, this project still provides an opportunity for the County to save money on its natural gas costs. In 2011, the County spent $111,089.07. In 2012, while utilizing the heat loop system for 10 months, the cost

| Natural Gas Cost Comparison - 2012 vs. 2011 |

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of gas to the County was only $59,134.46. This was a total savings to the County of $51,954.62 for the first year. We can expect an advanced number in savings in 2013. The County will continue to make use of a small amount of natural gas for their kitchen and as a backup heat source. From January 1, 2012, through December 31, 2012, the Authority provided the County with 5,413 Million Metric British Thermal Units (MMBTUs). For that time period, the County paid the Authority a rate of $4.80 per MMBTU, totaling $25,977.31, which is exactly half of the savings.

There has been no money allotted in the Authority’s 2013 Budget due to the fact that this is a self-sustaining system. The only cost to the Authority would be supplying the electric to the heat exchanger controls, which is minimal.

The County will assume responsibility for all maintenance, repair, operating costs and costs of all portions of the Thermal Heat Recovery Project located on the County property. These portions include the pump house, associated pumps, valves, heat exchangers, electric, water supply and alarm call boxes. The Authority is responsible for all maintenance, repair, operating costs and costs of all portions of the project located on Authority property. These portions include the heat exchanger, associated pipes, valves, electric, water and water supply.

After operating the Heat Loop Project for one year, NTSWA has discovered additional waste exhaust heat to capture. NTSWA has looked into several innovative ways to use this waste heat. One idea is to utilize the additional waste exhaust heat to evaporate leachate from the landfill. We have also researched tapping into the heat exchanger to create more water lines and then converting this hot water into electricity to sell to the grid.

Looking onward into the future NTSWA still has acreage to construct into landfill, which could produce excess gas that is more than PPL’s current engine can convert. If this does happen, NTSWA has already looked into the idea of building a Compressed Natural Gas Station (CNG) that would use the methane from our landfill to fuel our refuse and recycling collection trucks.

Due to the system being self dependent, no training programs are currently required.
NTSWA utilizes many different types of equipment that make the heat loop all possible. The system starts with a series of 4” HDPE wells placed on a minimum of 200 feet radius throughout the landfill. The wells are equipped with dewatering pumps. Removing the water from the wells makes gas migration easier. Each week PPL and NTSWA monitor these wells with a Landtec Gem 2000 gas monitor. The Landtec collects data, such as flow, oxygen, methane and vacuum in each of these wells. This data is then analyzed and used to help the gas collection system run at its peak performance. The wells are connected to a perimeter gas conveyance system that is controlled by a series of blowers. Putting negative pressure on the well field pulls the gas to the CAT 3520 engine. The engine then consumes the methane which produces a tremendous amount of heat from its cooling water jacket. This heat is supplied to the on-site leachate treatment plant, greenhouse and truck garage. In 2012 the CAT 3520 engine had a run efficiency of 96.4%. It was only shut down for necessary maintenance. The engine is monitored by a Supervisory Control and Data Acquisition (SCADA) computer program. This program monitors the engine’s performance. It collects data such as flow, oxygen, vacuum, and many other important factors. The program is on a private server system, so it is accessible anywhere with Internet. For the heat loop project, NTSWA tapped into the CAT 3520 exhaust system. The exhaust exits the flue at over 900 degrees Fahrenheit. It then enters the 3.28 million BTU heat exchanger where it increases the water temperature up to 220 degrees Fahrenheit. The water will not turn to steam, due to the pressure of the system.
After the water is heated, it is transported to the pump house through a 4 inch XTRU Therma Pipe. The pipe is insulated with 2 inches of polyurethane foam. The pipe is jacketed with an HDPE layer over the foam. This insulation is key in making the system most efficient by minimizing heat loss.

Once the heated water reaches the pump house it runs through a plate heat exchanger. This heat exchanger transfers the heat to each of the supply lines reaching the Bradford County Manor and Bradford County Correctional Facility.

The pump house is also equipped with one set of Armstrong pumps and three sets of Patterson pumps. Each set transports water in a separate loop. One loop carries water from the heat exchanger to the pump house, another transports within the pump house and two more loops transport to each of the county facilities. These pumps are set up on a variable drive system which enables the increase or decrease of the flow, making this a more efficient system.

Due to fluctuating water temperatures, an expansion tank was installed in the pump house. This allowed the water to expand and contract. The pump house also has a pressure relief valve that allows the pressure to escape into the atmosphere if overheated. There is an air separator located in the pump house that allows any air bubbles that may form to exit the system.

Lastly, we have many pressure gauges and valves that help monitor the system and a BTU meter that measures the amount of heat used by both of the county facilities.

Once the heated water leaves the pump house through the same insulated pipe, it then enters each of these facilities where another plate heat exchanger dispenses the heat to each of their systems.
The Heat Loop Project covers over 1,600 linear feet of property. Due to the majority of this project being below ground, only a small portion is visible. Public appearance is of the utmost importance to the Northern Tier Solid Waste Authority. Only two portions of this entire project are above ground. One being the 17’ by 4’ foot in diameter Heat Exchanger. The heat exchanger is tucked far within NTSWA’s property boundaries away from the public eye. The pump house is another visible aspect of the Heat Loop Project measuring 10’x 24’. The pump house sits on the county’s property alongside the Correctional Facility and is sided with a steel siding. All pipes entering and leaving the facility are coat-
ed with a white HDPE jacket to make this look more presentable.

Being a landfill and sometimes looked at negatively in the public eye, NTSWA is constantly seeking opportunities to better educate the public on the positive environmental stance we take at our facility. Numerous tours are given to showcase many aspects of our operation. From schools to gardening clubs NTSWA welcomes all visitors to our facility. Tours are given of our landfill, recycling facility and our most popular attraction being our state of the art hydroponic greenhouse.

Portions of our southern and eastern boundaries are equipped with 10’ high litter fences to contain any windblown litter. A minimum of 6 inches of daily cover soils are added each day to aid with litter control, odors and vector control. NTSWA’s staff is constantly working to sustain a clean, presentable and successful state of the art facility.
NTSWA’s entire operation is unique in itself beginning with the strong relationship held between PPL Renewable Energy and Northern Tier Solid Waste Authority. PPL and NTSWA partnered in 2001 when NTSWA decided to install the CAT 3516 engine to sell energy to the grid. Relations expanded in 2008 when PPL replaced NTSWA’s CAT 3516 with the CAT 3520 engine we have today. This engine is owned and operated by PPL. NTSWA sells the landfill gas to PPL and in turn PPL grants NTSWA with an additional 100 kilowatt hours (kwh) of electricity. NTSWA makes every attempt to utilize all waste energy from the engine by harnessing the heat from the engine’s cooling water jacket. Between these two energy sources NTSWA is able to heat and operate our on-site facilities including the truck garage, leachate treatment facility and our state-of-the-art hydroponic greenhouse.

Finally, the heat loop project taps into the last resource of energy from the engine by capturing the waste exhaust heat to provide a utility to Bradford County.

Aside from the gas utilization, NTSWA continues to distinguish itself with its unique integrative solid waste management system. NTSWA provides various services to the Northern Tier of Pennsylvania. NTSWA was the first, and remains the only, regional three county solid waste authority in Pennsylvania. Many steps have been taken to ensure that NTSWA can support our region for their waste disposal needs. Through its innovative services, NTSWA has proven that we are more than a landfill. Some of these services include waste disposal, waste collection, recycling collection and processing, septage treatment, street sweeping, educational programs and events, “controlled environmental agriculture” (Greenhouse) and now supplying heat as a utility to the facilities of Bradford County.
Northern Tier Solid Waste Authority  
P.O. Box 10  
Burlington PA 18814  
Attention: Scot Sample

Dear Mr. Sample,

We are writing in reference to the Northern Tier Solid Waste Authority’s application for the SWANA Landfill Gas Utilization Excellence Award. From our perspective, the Authority deserves the recognition that this award would bring because of its continued effectiveness in providing the community it serves with foresight and initiative in its strategic planning as well as its day-to-day operations. The partnership NTSWA has forged with the County has been instrumental in reducing the operating costs of two of our County-owned facilities in a way that could not have been realized without their initiative and execution.

In early 2009, David Terrill, Executive Director of NTSWA approached us with the idea that the County could benefit financially by utilizing the excess energy created by their use of methane gas generated in its’ landfill operation. Thus began a three year project that came to fruition in early 2012. Using a system of insulated piping, flow pumps and heat exchangers, the hot water from the generator would be pumped to the two adjacent County facilities: the County Correctional Facility and the County-Skilled Nursing Facility; and used to preheat the hot water at the facilities in conjunction with the gas-fired boilers at each facility. In doing so, there would be a reduced demand for natural gas.

After one full year of operation, we are quite excited by the results we have seen. There has been a combined reduction of 7,525.6 dekatherms resulting in a savings of $51,955 in natural gas purchases in 2012. We anticipate similar savings every year going forward, with the actual variance being dictated by the cost of gas.

Unfortunately, Dave was not able to see the fruition of his idea and efforts. He passed away unexpectedly in 2011; but this project will be a testament to his foresight and imagination for many years to come.

Therefore, we respectfully and enthusiastically recommend Northern Tier Solid Waste Authority for the Gold Excellence award.

Steve Gates, Fiscal Administrator  
Bradford County Commissioners
Dear SWANA,

Hello my name is David DeCristo from DeCristo Incorporated and I am writing to your association in reference to Northern Tier Solid Waste Authority’s “Heat Loop Project”. I have been very fortunate to work for NTSWA over the years on various stages of this generator/energy recovery system. In my 24 years in the mechanical contracting industry I am yet to see anything close to the complete use of energy as this. The “Heat Loop Project” which takes exhaust gas energy. yes exhaust gas energy to a heat exchanger to heat water is brilliant! “Wasted energy and noise” into free heat and lower decibels of noise. I have had many hours of thoughts on how this country needs to recover more energy since this project. This “Heat Loop Project” which heats the Bradford County Manor and the Bradford County Correctional Facility, also heats their domestic hot water at a savings to the taxpayers.

The NTSWA has always had a vision from the first generator they installed to this exhaust gas boiler on wanting to use all this energy because “It is the right thing to do” environmentally. There have been challenges along the way but NTSWA always stuck to the project. Hopefully this project inspires more landfills to follow suit.

When working with Dave Terrill before his passing he stopped by my office (which he rarely if ever did) and he closed the door behind him and he made me promise him that I would see the completion of this “Heal Loop Project”. I did not know at the time why, but we all found out soon enough with his passing. Here is a man on his last days or months of life and he wanted this loop completed. During his sickness and after his death I worked with the NTSWA team and they continued with the vision Dave and the NTSWA Board diligently.

I hope you will consider the NTSWA “Heat Loop Project” for the GOLD Excellence Award.

Sincerely,

David DeCristo
April 16, 2013

Mr. Scot Sample, Executive Director
Northern Tier Solid Waste Authority
P.O. Box 10
Burlington, PA 18814-0010

Dear Mr. Sample:

I am very happy to have an opportunity to voice my support for the application of the Northern Tier Solid Waste Authority (NTSWA) for a “Landfill Gas Utilization Excellence Award” through the Solid Waste Association of North America (SWANA).

The Authority has maintained a good relationship with the communities it serves within the region, and I believe it has demonstrated innovation and ingenuity in its operations – most recently through its landfill gas utilization program. Methane gas collected from decomposing waste in the landfill is used to operate a CAT 3520 engine that produces electricity. This electricity is utilized by the local power grid as well as the onsite Leachate Treatment Facility, Truck Garage and Greenhouse. Hot water from the engine is also used to heat these three facilities. The CAT 350 is also used in the “Heat Loop Project”. This involves harnessing the waste exhaust heat from the CAT 350 engine and converting it into thermal energy. This heat is transported to the Bradford County Manor and the Bradford County Correctional Facility through an insulated piping system. These are certainly impressive demonstrations of transforming a waste product to a valuable resource.

I applaud the work of the Northern Tier Solid Waste Authority and the vision you have shown in seeking new ways to harvest and utilize waste energy.

Sincerely,

Matthew E. Baker
State Representative
68th Legislative District
April 3, 2013

Scot Sample, Exec. Director
Northern Tier Solid Waste Authority
P O Box 10
Burlington, PA 18814-0010

Dear Scot,

Please accept this as our letter of support for Northern Tier Solid Waste Authority receiving the Solid Waste Association of North America “Landfill Gas Utilization Excellence Award”. NTSWA has done many innovative projects, using methane gas generated by decomposing waste in the landfill for growing lettuce which is used in several markets in Sullivan for resale and used in several restaurants in Sullivan County providing fresh produce for markets and private homes in Sullivan County and markets in Bradford County.

Another innovative project is using waste exhaust heat from their CAT 3520 engine and converting it into thermal energy used to heat the Bradford County Manor and Bradford County Correctional Facility. This helps Bradford County and supplies NTSWA with additional income.

The NTSWA was willing to help its chartering counties by sharing revenues received the past several years from disposal of the Marcellus Gas drilling cuttings to be placed in an Environmental Stewardship Fund to be used to fund projects that benefit the residents of each county through environmental projects, energy conservation and similar endeavors. Even though NTSWA is no longer receiving revenues from the gas drilling cuttings, NTSWA is always open to new ways to recycle old products and generate new products that will help the residents of the neighboring counties.

For all these reasons, we strongly urge you to award Northern Tier Solid Waste Authority the Solid Waste Association of North America (SWANA) “Landfill Gas Utilization Excellence Award”.

Sincerely,

SULLIVAN COUNTY COMMISSIONERS

[Signatures]
Robert R. Getz, Chairman
Wylie S. Norton, Vice Chairman
Darla M. Bortz, Commissioner
April 10, 2013

Mr. Scot Sample  
Northern Tier Solid Waste Authority  
P.O. Box 10  
Burlington, PA  18814

Re:  Landfill Gas Utilization Excellence Award  
    Bradford County Landfill No. 2 - ID No. 101243  
    West Burlington Township, Bradford County

Dear Mr. Sample:

The Department of Environmental Protection understands that you are applying for the Landfill Gas Utilization Excellence Award from the Solid Waste Association of North America. For some time you have been utilizing landfill gas to provide power and heat to the leachate treatment facility, the truck garage, and the greenhouse.

This project went beyond the landfill boundary to provide a benefit to the neighbors. The heat loop supplies heat to both the Bradford County Manor and to the Bradford County Correctional Facility. This provides a heating benefit and a reduction in operating cost to the facilities while better utilizing a resource at the landfill.

The Department acknowledges the environmental benefits of the project while commending the landfill for its forward thinking style of landfill management.

If you have any questions, please contact me at 570.327.3752 or via email at lhouser@pa.gov.

Sincerely,

Lisa D. Houser  
Lisa D. Houser, PE  
Environmental Engineer Manager  
Waste Management
April 4, 2013

Scot Sample, Executive Director
Northern Tier Solid Waste Authority
PO Box 10
Burlington, PA 18848-0010

Dear Scot:

Thank you for providing me with an update on your latest endeavor, the “Heat Loop Project” that involves harnessing the waste exhaust heat from your CAT 3520 engine and converting it into thermal energy and connecting it with the two nearby county facilities, the Bradford County Manor and the county prison, through an insulated piping system.

Because I have had the opportunity in the past to tour the facility and view the various innovative projects that you have undertaken, it is with great pleasure as your Senator, as well as chairman of the Senate Environmental and Energy Committee, that I recommend the Northern Tier Solid Waste Authority (NTSWA) for the Solid Waste Association of North America’s Landfill Gas Utilization Excellence Award. I commend the staff and the Board of the NTSWA as it continues to be a leader in its field.

Best wishes as you move forward in this process and keep up the great work!

Sincerely,

GENE YAW
SENATOR

GY/gak
April 8, 2013

Solid Waste Association of North America (SWANA)
1100 Wayne Avenue – Suite 700
Silver Spring, MD 20910

Attention: John Skinner, Executive Director and CEO

Re: Letter of Support

Dear Mr. Skinner:

PPL Renewable Energy ("PPL") is pleased to provide this letter of support for the nomination of the Northern Tier Solid Waste Authority (NTSWA) for your “Landfill Gas Utilization Excellence Award”.

PPL has had the privilege of working with NTSWA on the beneficial use of the landfill gas collected at their facility in Bradford County, PA for over a decade. From the first project in 2001 to install a 815 kW landfill gas engine/generator to the latest “Heat Loop Project” completed in 2012, NTSWA has continued to expand the beneficial use of landfill gas by using more of both the electrical and thermal energy produced from the gas.

When the initial landfill gas engine was installed in 2001, not only did it supply electricity for sale on the grid, it supplied the electrical needs of the landfill’s leachate treatment facility and truck garage. Further, thermal energy from the engine’s water loop was recovered and used to heat the two facilities. By supplying heat to the leachate treatment process, the rate of decomposition of the waste material was improved.

NTSWA was convinced that more could be done and continued to look at other potential opportunities. In 2007, they took a major step forward by building at 14,400 square foot hydroponic greenhouse near the landfill gas generator. The generator supplies 100% of the electrical and thermal needs of the greenhouse. A key electrical load in the greenhouse is growing lights that are operated to supplement sunlight so that the plants receive the optimum daily light. The jacket water heat recovery system can supply up to 2,400,000 BTUs per hour to the greenhouse. Once in operation, the greenhouse employed four people and provided an annual economic value of $200,000.

In 2008, a new, expanded, gas collection system was installed along with a larger 1,800 kW engine. The new systems greatly increased the amount of landfill gas captured and the electrical and thermal energy produced from that gas.
With the increase amount of energy available, NTSWA continued to look for ways to make use of the energy. In 2011, they began to implement the "Heat Loop Project". Adjacent to the landfill property are two Bradford County owned 24/7 occupied facilities that utilize fossil fuel for their heating and domestic hot water needs. By installing an exhaust boiler on the engine and piping the hot water to the two buildings, NTSWA was able to displace the need for fossil fuel. When completed in 2012, this “Heat Loop Project” supplied up to 5,500,000 BTUs per hour to the two buildings.

NTSWA has gone beyond a simple landfill gas beneficial use project – they have completed many landfill gas projects that build on each other over a time frame that exceeds a decade. PPL Renewable Energy, as an independent developer of LFGTE projects, has worked at a dozen landfills. Despite being a smaller landfill in a remote, rural part of Pennsylvania, NTSWA has been one of our most innovative and persistent landfill customers in the area of utilization of landfill gas to produce useful energy and find a beneficial use of that energy.

PPL believes that NTSWA would be an excellent choice for SWANA’s “Landfill Gas Utilization Excellence Award”.

Sincerely,

[Signature]

John K. Steckel, Jr.
April 26, 2013

Scot Sample
Executive Director
Northern Tier Solid Waste Authority
P.O. Box 10
Burlington, PA 18814

RE: SWANA Landfill Gas Utilization Excellence Award

Dear Scot:

It has been our extreme pleasure to be involved with the Northern Tier Solid Waste Authority and the "Heat Loop Project." As engineers for the project we had the honor of taking a concept and turning it into an actuality. I believe that is what NTWSA is all about. An idea takes hold and the people there are not satisfied until something is done about it.

Combating the negative images associated with a landfill is not easy, but the NTWSA has managed to offset those images with some very positive innovations. Not only have they taken the waste gas from the landfill and used it to power a generator that supplies energy to heat and create hot water for their own buildings, but they also supply energy back to the grid when the power company needs it. Now, in addition to this, the new hydronic piping system captures waste heat from the generator’s exhaust and transfers that recovered energy to supply heating/hot water to two County facilities, thereby maximizing the amount of energy that can be extracted from a landfill (energy that would otherwise go “up into the clouds”) and reducing the County’s fossil fuel consumption. It is an incredible, environmentally friendly use of energy that was going to waste.

This was one of the best projects we have ever been a part of in its uniqueness, its contribution to the environment, how smoothly and successfully the project was carried out and most importantly the terrific people who were involved. It is easy to see the strong sense of camaraderie among the employees at NTWSA, proven by the fact that many have worked for the company for a very long time. What was truly amazing was that they did not view us as outsiders, but rather someone else who had joined their team to work together toward a common goal. When we attended job conferences and walked the site during construction, it never seemed like going to work; it felt like visiting old friends.

The passing of Dave Terrill in 2011 was a sorrowful loss to everyone. His ingenuity and drive to always make things better were an inspiration to everyone around him. I can tell that the people at the Northern Tier Solid Waste Authority have taken his legacy to heart and continue to look for opportunities to make the world a better place, in Dave’s honor.

Sincerely,

Michael L. Norris, PE
President

270 Walker Drive, Suite 201B
State College, PA 16801
Email: miken@mlnai.com
Web: mlnai.com
Phone: 814-867-3823
Fax: 814-867-4823

Our primary focus is...Engineering...the way it should be...
April 29, 2013

Mr. Scot Sample
Executive Director
Northern Tier Solid Waste Authority
PO Box 10
Burlington, PA 18814-0010

RE: Letter of Support for the SWANA Landfill Gas Utilization Excellence Award

Dear Mr. Sample:

I am delighted to provide this letter of support for the above referenced SWANA Excellence Award. Fagan Engineers is very familiar with NTSWA’s landfill gas management facilities having provided landfill engineering services to NTSWA over the past 20 years. NTSWA is an industry leader in landfill gas utilization by producing electricity which powers the landfill’s leachate treatment facility, truck garage and greenhouse with excess energy connected to the local power grid. Excess heat from the CAT 3520 engine generator provides hot water which is also used to heat the three aforementioned landfill facilities.

The unique utilization of landfill gas is further demonstrated by the Heat Loop Project completed in February 2012. This project, which was the brain child of former Executive Director Dave Terrill who passed away in 2011, harnesses the waste heat from the CAT engine generator and converts it to thermal energy. Utilizing an insulated piping system, the heat is transported via a looped system to the Bradford County Manor (elderly housing) and the Bradford County Correctional Facility.

Having been involved in numerous solid waste management facilities in New York and Pennsylvania, Fagan Engineers can attest to the excellent and comprehensive utilization of landfill gas that the Northern Tier Solid Waste Authority has implemented during the past decade. We believe that the NTSWA programs are very worthy of SWANA’s Landfill Gas Utilization Excellence Award.

Sincerely,

FAGAN ENGINEERS & LAND SURVEYORS, P.C.

James B. Gensel, P.E., CPESC
President