

# BLACK CREEK TOWNSHIP

## STORMWATER MANAGEMENT PERMIT APPLICATION

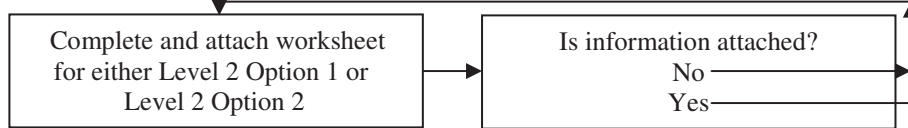
<b>Applicant Name:</b> _____ <b>Address:</b> _____ <b>City:</b> _____ <b>State:</b> _____ <b>Zip:</b> _____ <b>Phone:</b> _____ <b>Email:</b> _____	<b>Nature of Activity (i.e. driveway, new structure, parking lot, road, trail, subdivision, etc.):</b> _____ <b>Site Address:</b> _____ <b>Tax Parcel #:</b> _____
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**Total Proposed Impervious Area (I) (sq. ft.):** \_\_\_\_\_

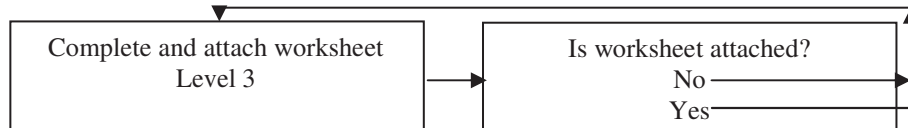
**Total Proposed Earth Disturbance (ED) (sq. ft.):** \_\_\_\_\_

**Level 1:** (I) is between 250 sq. ft. and 1,000 sq. ft. or (ED) is between 500 sq. ft. and 5,000 sq. ft.

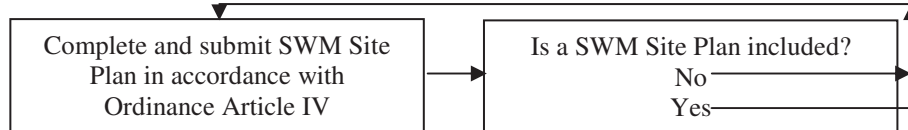
**Level 2:** (I) is between 1,000 sq. ft. and 5,000 sq. ft. or (ED) is between 5,000 sq. ft. and 10,000 sq. ft.



**Level 3:** (I) is between 5,000 sq. ft. and 10,000 sq. ft. or (ED) is between 10,000 sq. ft. and 20,000 sq. ft.



**Level 4:** (I) is greater than 10,000 sq. ft. or (ED) is greater than 20,000 sq. ft. and all Land Developments



Show on the accompanying sketch that adverse downstream stormwater impacts are not created or worsened, and that additional stormwater runoff will not discharge towards adjacent property owners.

All requirements of the Ordinance have been met. Applicant Signature: \_\_\_\_\_ Date: \_\_\_\_\_

**FOR REVIEWER ONLY:**

This stormwater management permit application has been APPROVED DENIED (circle one)

Reviewed by (print): \_\_\_\_\_ Reason for Denial: \_\_\_\_\_

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

# **BLACK CREEK TOWNSHIP STORMWATER MANAGEMENT**

## **Level 3 Application Workbook**

### **Determination of BMPs and Volume Requirements**

All proposed impervious areas must be included in the determination of the amount of new impervious areas and the size of proposed BMPs needed to control stormwater.

Proposed impervious areas on an individual residential lot include:

- Roof area
- Pavement
- Sidewalks
- Driveways
- Patios
- Porches
- Permanent pools
- Parking areas

Sidewalks, driveways, or patios that are constructed with gravel or pervious pavers that will not be converted to an impervious surface in the future need not be included in this calculation. Therefore, the amount of proposed impervious area can be reduced for proposed driveways, patios, and sidewalks through the use of gravel, pervious pavement, and turf pavers. All proposed impervious areas must be constructed so that runoff is conveyed to a BMP; no runoff can be directed to storm sewers, inlets, or other impervious areas (i.e., street).

All new construction should incorporate design techniques that include: minimizing the amount of land disturbance, reducing impervious cover, disconnecting gutters and directing runoff to vegetated areas to infiltrate, and redirecting the flow of runoff from impervious driveways to vegetated areas instead of to the street or gutter.

Below are the steps that must be undertaken to meet the Ordinance requirements. The results obtained for each step must be included in the Small Projects Worksheet found in Table E-4:

**STEP 1** – Determine the total area of all proposed impervious surfaces (square feet) that will need to drain to one or more BMPs.

**STEP 2** – Determine locations where BMPs need to be placed, and the contributing impervious area “*I*” (square feet) to each.

**STEP 3** – Select the BMPs to be used and determine the requirements of each from Section E.3.

**STEP 4** – Obtain the required storage volume “*V*” (cubic feet) and surface area “*A*” (square feet) needed for each of the proposed BMPs from the appropriate heading below.

Note: all calculations are based on 1 inch of rainfall.

#### **For Rain Barrels/Cisterns**

- The typical volume of a rain barrel is less than 50 gallons; if a greater volume is required, more than one rain barrel will be needed or a cistern may be used.
- For calculations, assume the rain barrel is already 25% full.
- Calculate volume in Cubic Feet:

$$V_{cf} = (1 \text{ inch} \times 1/12 \times I) / 0.75$$

- Convert to Gallons:

$$V_{gal} = V_{cf} \times 7.48$$

#### **For Rain Gardens/Bioretenion or Dry Well #1:**

- Rain gardens and bioretention areas are only used for depths less than or equal to 1.0 feet; a dry well #1 is used for depths between 1.0 and 4.0 feet.
- Select the depth “*D*” (feet) for the facility.
- For calculations, assume the facility is empty (0% full).
- Calculate volume in Cubic Feet:

$$V_{cf} = (1 \text{ inch} \times 1/12 \times I)$$

- Calculate surface area of the facility in Square Feet:

$$A_{sf} = V_{cf} / D$$

### For Dry Well #2 or Infiltration Trench:

- A dry well #2 is used for depths between 1.5 feet and 4.0 feet; an infiltration trench is used for depths between 2.0 and 5.0 feet.
- Select the depth “*D*” (feet) for the facility.
- For calculations, assume the void ratio of the stone is 40%.
- Calculate volume in Cubic Feet:

$$V_{cf} = (1 \text{ inch} \times 1/12 \times I) / 0.4$$

- Calculate surface area of the facility in Square Feet:

$$A_{sf} = V_{cf} / D$$

- Determine the dimensions of the facility based on “*A*” calculated.

### STEP 5 - Sketch a simple site plan that includes:

- Name and address of the owner of the property, and or name and address of the individual preparing the plan, along with the date of submission.
- Location of proposed structures, driveways, or other paved areas with approximate size in square feet.
- Location, orientation, and dimensions of all proposed BMPs. For all rain gardens/bioretention, infiltration trenches, and dry wells, the length, width, and depth must be included on the plan. For rain barrels or cisterns the volume must be included.
- Location of any existing or proposed on-site septic system and/or potable water wells showing rough proximity to infiltration facilities.
- Location of any existing waterbodies such as; streams, lakes, ponds, wetlands, or other waters of the Commonwealth within 100 feet of the project site, and the distance to the project site and/or BMPs. It is recommended that the project or BMPs be located at least than fifty (50) feet away from a perennial or intermittent stream. If an existing buffer is legally prescribed (i.e., deed, covenant, easement, etc.), the existing buffer shall be maintained.
- Location of all existing structures including buildings, driveways, and roads within fifty (50) feet of the project site.

Fill in the small projects worksheet found in Table E.4, then submit the worksheet and the simple site sketch (or equivalent) to Black Creek Township.

#### E.4. Example

Joe Homeowner wants to build an 800 sq. ft. two car garage, and a 700 sq. ft. impervious driveway. Site conditions in the urban setting prevent the use of Disconnected Impervious Area (DIA) as a BMP.

**STEP 1** – Determine the total area of all proposed impervious surfaces that will need to drain to one or more BMPs.

- Garage roof: 20 ft. x 40 ft. = 800 sq. ft.
- Driveway: 50 ft. x 14 ft. = 700 sq. ft.
- Total proposed impervious surface = 800 + 700 = **1,500 sq. ft.**

**STEP 2** – Determine locations where BMPs need to be placed, and the contributing impervious area “*I*” to each.

- Use BMP #1 to capture runoff from the garage ( $I_1 = 800$  sq. ft.)
- Use BMP #2 to capture runoff from the driveway ( $I_2 = 700$  sq. ft.).

**STEP 3** – Select the BMPs to be used and determine the requirements of each from Section E.3.

- BMP #1 – rain barrel/cistern
- BMP #2 – infiltration trench

**STEP 4** – Obtain the required storage volume “*V*” and surface area “*A*” needed for each of the proposed BMPs from the appropriate heading below.

##### For Rain Barrel/Cistern (BMP #1)

- Calculate volume in cubic feet:

$$\begin{aligned} V_{cf} &= (1 \text{ inch} \times 1/12 \times I_p) / 0.75 \\ &= (1 \text{ inch} \times 1/12 \times 800) / 0.75 \\ &= 88.89 \text{ cubic feet} \end{aligned}$$

- Convert to gallons:

$$\begin{aligned} V_{gal} &= V_{cf} \times 7.48 \\ &= 88.89 \times 7.48 \\ &= 664.8 \text{ gallons} \rightarrow \text{round up to 665 gallons} \end{aligned}$$

### For Infiltration Trench (BMP #2)

- Select depth “**D**” for the facility of **2 feet** (between 2.0 feet and 5.0 feet).
- Calculate volume in cubic feet:

$$\begin{aligned}V_{cf} &= (1 \text{ inch} \times 1/12 \times I_2) / 0.4 \\&= (1 \text{ inch} \times 1/12 \times 700) / 0.4 \\&= 145.8 \text{ cubic feet} \rightarrow \text{round up to } 150 \text{ cubic feet}\end{aligned}$$

- Calculate surface area of the facility in square feet:

$$\begin{aligned}A_{sf} &= V_{cf} / D \\&= 150 / 2 \\&= 75 \text{ square feet}\end{aligned}$$

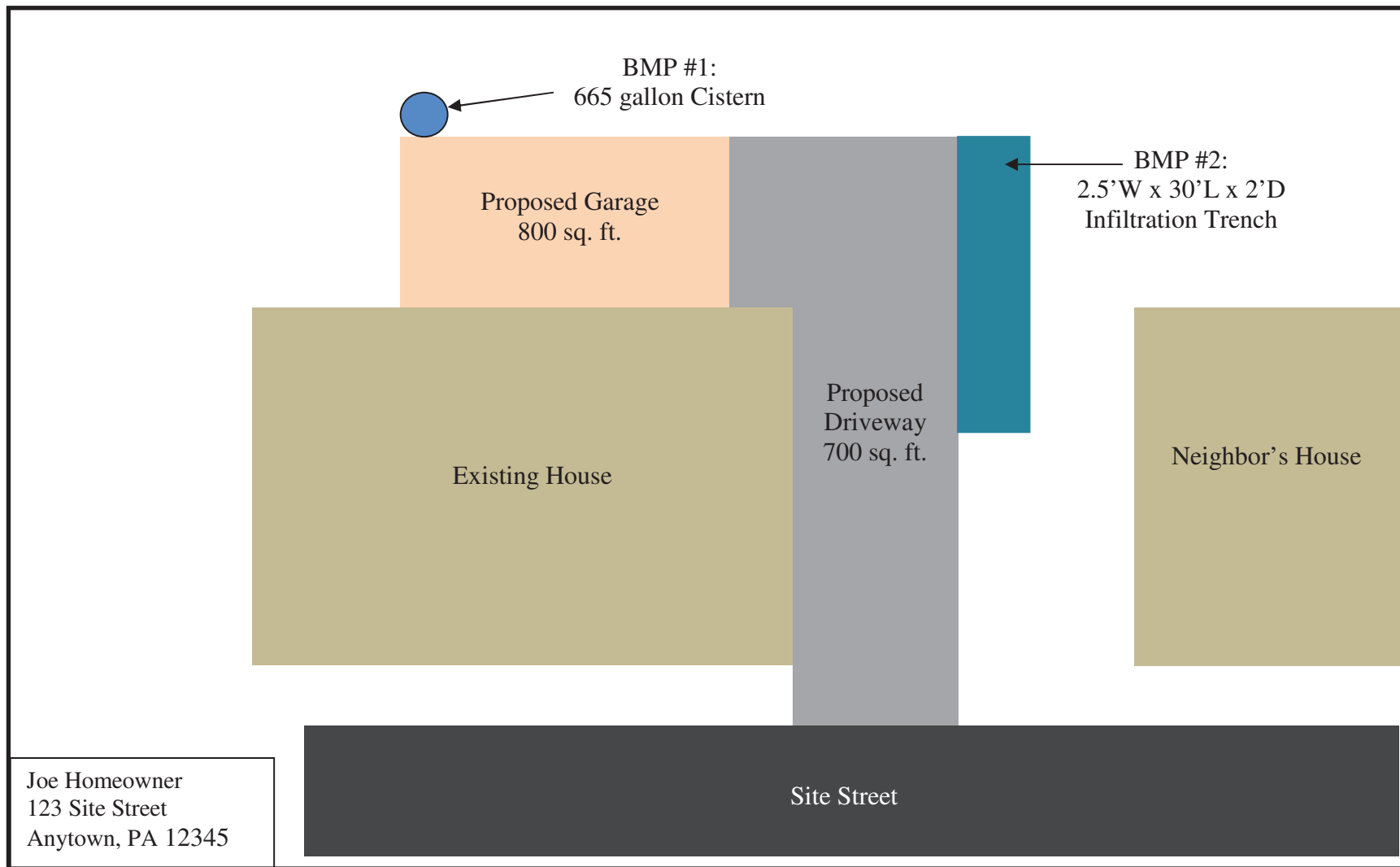
- The driveway is 50 feet long, so using the upper 30 feet of the driveway as the length of the infiltration trench, the width of the trench =

$$75 \text{ square feet} / 30 \text{ feet} = 2.5 \text{ feet}$$

- Use a **2.5 ft. wide x 30 ft. long x 2 ft. deep** infiltration trench.

**STEP 5** – Prepare a simple site sketch (Figure E.7) and complete Small Projects Worksheet (Table E.4) to send to Black Creek Township.

**Figure E.7. Simple Site Sketch of Proposed Project and Proposed BMPs.**



**EXAMPLE - Level 3 Small Projects Worksheet.**

Small Projects Worksheet					
STEP 1					
Component #1 of Project	Impervious Area from Component #1	Component #2 of Project	Impervious Area from Component #2	Component #3 of Project	Impervious Area from Component #3
Garage Roof	800 sq. ft.	Driveway	700 sq. ft.	N/A	N/A
Total Impervious Area =		1,500 sq. ft.			
STEP 2					
BMP #1		BMP #2		BMP #3	
Captures:	Garage Roof	Captures:	Driveway	Captures:	N/A
Impervious Area I <sub>1</sub> :	800 sq. ft.	Impervious Area I <sub>2</sub> :	700 sq. ft.	Impervious Area I <sub>3</sub> :	N/A
STEP 3					
BMP #1		BMP #2		BMP #3	
Type:	Cistern	Type:	Infiltration Trench	Type:	N/A
STEP 4					
BMP #1		BMP #2		BMP #3	
Volume:	88.89 cu. ft.	Volume:	150 cubic feet	Volume:	N/A
Dimensions:	665 gallons	Dimensions:	2.5' W x 30'L x 2' D	Dimensions:	N/A
Note: For additional BMPs, use additional sheets					



**Black Creek Twp. SWM Level 3 Application Worksheet)**

Applicant: \_\_\_\_\_

Site Address or Tax Parcel #: \_\_\_\_\_

Small Projects Worksheet					
STEP 1					
Component #1 of Project	Impervious Area from Component #1	Component #2 of Project	Impervious Area from Component #2	Component #3 of Project	Impervious Area from Component #3
	sq. ft.		sq. ft.		sq. ft.
Total Impervious Area =		sq. ft.			
STEP 2					
BMP #1		BMP #2		BMP #3	
Captures:		Captures:		Captures:	
Impervious Area I <sub>1</sub> :	sq. ft.	Impervious Area I <sub>2</sub> :	sq. ft.	Impervious Area I <sub>3</sub> :	sq. ft.
STEP 3					
BMP #1		BMP #2		BMP #3	
Type:		Type:		Type:	
STEP 4					
BMP #1		BMP #2		BMP #3	
Volume:		Volume:		Volume:	
Dimensions:		Dimensions:		Dimensions:	
Note: For additional BMPs, use additional sheets					

# BLACK CREEK TOWNSHIP

## STANDARD OPERATION AND MAINTENANCE (O&M) AGREEMENT STORMWATER MANAGEMENT BEST MANAGEMENT PRACTICES (SWM BMPs)

**THIS AGREEMENT**, made and entered into this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, by and between \_\_\_\_\_, (hereinafter the “Landowner”), and the Municipality of Black Creek Township, Luzerne County, Pennsylvania, (hereinafter “Black Creek Township”);

### WITNESSETH

**WHEREAS**, the Landowner is the owner of certain real property as recorded by deed in the land records of Luzerne County, Pennsylvania, Deed Book \_\_\_\_\_ at page \_\_\_\_\_, (hereinafter “Property”).

**WHEREAS**, the Landowner is proceeding to build and develop the Property; and

**WHEREAS**, the SWM BMP O&M Plan approved by Black Creek Township (hereinafter referred to as the “Plan”) for the property identified herein, which is attached hereto as Appendix A and made part hereof, as approved by Black Creek Township, provides for management of stormwater within the confines of the Property through the use of BMPs; and

**WHEREAS**, Black Creek Township, and the Landowner, his successors and assigns, agree that the health, safety, and welfare of the residents of Black Creek Township and the protection and maintenance of water quality require that on-site SWM BMPs be constructed and maintained on the Property; and

**WHEREAS**, Black Creek Township requires, through the implementation of the approved SWM Site Plan entitled \_\_\_\_\_, completed by \_\_\_\_\_, last revised \_\_\_\_\_, including all applicable construction detail sheets, that SWM BMPs as required by said Plan and the Black Creek Township Stormwater Management Ordinance be constructed and adequately operated and maintained by the Landowner, successors, and assigns.

**NOW, THEREFORE**, in consideration of the foregoing promises, the mutual covenants contained herein, and the following terms and conditions, the parties hereto agree as follows:

1. The Landowner shall construct the BMPs in accordance with the plans and specifications identified in the approved SWM Site Plan.

2. The Landowner shall operate and maintain the BMPs as shown on the Plan in good working order in accordance with the specific maintenance requirements noted on the approved SWM Site Plan at the Landowners sole expense.
3. The Landowner hereby grants permission to Black Creek Township, its authorized agents and employees, to enter upon the property, at reasonable times and upon presentation of proper credentials, to inspect the BMPs whenever necessary. The Landowner shall reimburse Black Creek Township for all reasonable costs for inspections that are not covered by the Black Creek Township Post Construction Stormwater Inspection Fund Fee paid to Black Creek Township by the Landowner prior to SWM Site Plan approval.
4. In the event the Landowner, his successor and assigns, fails to maintain the BMPs in good working condition acceptable to Black Creek Township, Black Creek Township may enter upon the property and take such necessary and prudent action to maintain said BMPs and to charge the costs of the maintenance and/or repairs to the Landowner, his successors and assigns. It is expressly understood and agreed that Black Creek Township is under no obligation to maintain or repair said facilities and in no event shall this agreement be misconstrued to impose any such obligation on Black Creek Township. In the event Black Creek Township, pursuant to this agreement, performs work of any nature, or expends any funds in performance of said work for labor, use of equipment, supplies, materials and the like on account of the Landowner's or his successor's and assign's failure to perform such work, the Landowner, his successors and assigns, shall reimburse Black Creek Township upon demand, within thirty (30) days of receipt of invoice thereof, for all costs incurred by Black Creek Township hereunder. If not paid within said thirty (30) day period, Black Creek Township may enter a lien against the property for costs, or may proceed to recover its costs through proceedings in equity or at law as authorized under the provisions of the Second Class Township Code or any other law of the Commonwealth of Pennsylvania.
5. The Landowner, his successors and assigns, shall and do hereby agree to exonerate, indemnify and save harmless Black Creek Township, Black Creek Township officers, elected officials, engineers and attorneys and Black Creek Township appointees and any other agent, from any and all claims, actions, awards, verdicts, judgments, damages, casualties and/or occurrences that do arise out of Black Creek Township's approval and the construction, presence, existence and/or maintenance of the BMPs by the Landowner and the Landowner's heirs, successors and/or assigns.
6. In the event a claim is asserted against Black Creek Township, its agents or employees, Black Creek Township shall promptly notify the Landowner, his successors and assigns, and the Landowner shall defend, at their own expense, any suit based on such claim. If any judgment or claims against Black Creek Township, its agents or employees shall be allowed, the Landowner, his

successors and assigns shall pay said judgment and/or claim, as well as all costs and expenses in connection therewith.

7. In the event of an emergency or the occurrence of special or unusual circumstances or situations, Black Creek Township may enter the property, if the Landowner is not immediately available, without notification or identification, to inspect and perform necessary maintenance and repairs, if needed, when the health, safety or welfare of the citizens is at jeopardy. However, Black Creek Township shall notify the Landowner of any inspection, maintenance or repair undertaken within ten (10) days of the activity. The Landowner shall reimburse Black Creek Township for the costs.
8. If any part of this Agreement is held to be invalid or unenforceable, all other remaining provisions of the Agreement shall remain in full force and effect.
9. Nothing in this Agreement shall be construed as an offer by the Landowner to dedicate any of the BMPs to Black Creek Township, and nothing herein shall be deemed to be an acceptance of an offer of dedication.
10. This agreement shall be recorded by the Landowner among the land records of Luzerne County, Pennsylvania prior to SWM Site Plan approval being issued by Black Creek Township, and shall constitute a covenant running with the property and/or equitable servitude, and shall be binding on the Landowner, his administrators, executors, assigns, heirs, and any other successors in interests, in perpetuity.

ATTEST:

WITNESS the following signatures and seals:

(SEAL)

**For Black Creek Township:**

\_\_\_\_\_  
Chairman

\_\_\_\_\_  
Vice Chairman

\_\_\_\_\_  
Secretary/Treasurer

**For the Landowner:**

\_\_\_\_\_

ATTEST:

\_\_\_\_\_ (City, Borough, Township)

County of \_\_\_\_\_, Pennsylvania

I, \_\_\_\_\_, a Notary Public in and for the county and state aforesaid, whose commission expires on the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, do hereby certify that

\_\_\_\_\_ whose name(s) is/are signed to the foregoing Agreement bearing date of the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, has acknowledged the same before me in my said county and state.

**GIVEN UNDER MY HAND THIS** \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_\_.

\_\_\_\_\_  
**NOTARY PUBLIC**

\_\_\_\_\_  
**(SEAL)**