GUIDANCE FOR 50 OR MORE REALTY IMPROVEMENT CERTIFICATIONS

THE NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION

Division of Water Quality
Bureau of Nonpoint Pollution Control

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INTRODUCTION

Development of rural land is occurring at a rapid pace throughout the State of New Jersey. In areas that are not served by municipal sewers, residential homes rely on septic systems to dispose of their sanitary wastewater. Septic systems provide a safe and reliable method for disposing of residential wastewater when they are constructed and operated in accordance with the accepted standards.

The New Jersey Department of Environmental Protection (Department) has modern regulations for septic system design and construction at N.J.A.C. 7:9A, called the "Standards for Individual Subsurface Sewage Disposal Systems." These rules authorize construction of onsite sewage systems that are protective of human health and the environment, particularly as they affect surface and ground water. Surface water quality is protected by distance setbacks from streams and wetlands. Ground water is protected by requiring sufficient distance between the disposal system and the water table, and by relying on modern well construction requirements. These regulatory measures effectively protect water bodies and wells against contamination from human disease organisms.

However, each septic system, whether working properly or not, generates water soluble pollutants that can eventually enter streams, aquifers, and lakes. For example, each home generates about 30 to 40 pounds per year of nitrate nitrogen and some other pollutants such as sodium and chloride. If building lots are too densely packed together, the nitrates and other pollutants can accumulate in streams and wells at levels that are not considered safe under New Jersey Water Quality Standards. When adequate distance is maintained between homes with onsite sewage disposal systems, experience proves that contamination problems are rare. Therefore, the Department review of 50 or more Realty Improvement Applications is intended to establish a building lot density that is likely to protect the ground water and surface water and to comply with the Ground and Surface Water Quality Standards.

This Guidance Document explains the procedure and rationale used by the Department to review and ultimately approve applications for 50 or more Realty Improvement Certifications. This process is one more way that the New Jersey Department of Environmental Protection is working to protect the waters of the State for present and future generations.

For more information visit our web site at:

www.state.nj.us/dep/dwq/sep50mor.htm

or contact us at:

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Part I. OBTAINING CERTIFICATION FOR 50 OR MORE REALTY IMPROVEMENTS

The New Jersey Department of Environmental Protection is authorized by N.J.S.A. 58:11-25 to certify subdivisions involving 50 or more realty improvements. The purpose of the Department's review is to establish the maximum number of building lots that can be built at a subdivision while protecting the ground water and surface water quality from the nitrate produced by the individual septic systems.

Simplified Nitrate Dilution Model Approach

The "Simplified Approach" identified in Part II considers that the nitrate generated by the collective group of septic systems at a subdivision will be diluted by the infiltrating precipitation entering the area in question. The *"Simplified Nitrate Dilution Model Approach"* can be developed and submitted to the Department quickly and without great cost, since no geological fieldwork is necessary. The *"Simplified Approach"* relies on information found in easily obtained documents and tables, and requires only simple calculations. A scientist, planner or engineer can develop the model, or anyone with an ability to do simple calculations based on maps and areas. Although the *"Simplified Nitrate Dilution Model Approach"* is somewhat of an oversimplification of what actually happens in the environment, it closely approximates the results of more detailed analyses and is consistent with our empirical (observed) knowledge of lot sizes that are protective of the ground water quality. The Department can thusly review and render a decision quickly, usually within several weeks. The *"Simplified Approach"* is perfect for someone who wants to obtain a fast review and approval based on a simple and standardized approach, with a minimum of cost.

As of November 1, 2002, there is no acceptable alternative method for establishing appropriate lot sizes unless an administratively complete application is currently being processed by the Department or if a pre-application meeting with the Department has been completed, which identifies the use of a previously accepted method. Only the "*Simplified Nitrate Dilution Model Approach"* (A above) is acceptable.

The Department highly recommends you to follow the instructions and information provided in this document and its appendices. ***Failure to follow these instructions will cause an Administrative Denial of the entire submission****. Failure to use the "Simplified Nitrate Dilution Approach" will result in an automatic Administrative Denial of the entire submission. With any denial, your* ***complete submission*** *will be returned for corrections noted or recalculation using the "Simplified Nitrate Dilution Approach".*

Part II. INSTRUCTIONS FOR USING THE SIMPLIFIED NITRATE DILUTION MODEL

RATIONALE FOR DETERMINING NUMBER OF BUILDING LOTS

The approach to determine number of building lots is based on the concept that the nitrate that emanates from septic systems can be diluted to a safe level by the annual volume of water that enters the ground as recharge. Groundwater recharge is a function of precipitation, runoff, infiltration, and evaporation/transpiration. The Simplified Model assumes that the annual nitrate mass load is completely mixed with the annual volume of water entering the ground as recharge. This simplified method is reasonably accurate because New Jersey has a scientifically based method for estimating recharge based on actual soil mapping units, called soil series.

Calculating Lot Density Using the Model

Lot size is established using a simple mass balance equation or model. The essential form of the equation underlying the "Nitrate Dilution" model is shown in Equation 1.

$$\mathrm{mg/L \cdot Nitrate} = \frac{\mathrm{mg \cdot No_3 / home \cdot year}}{\mathrm{Volume Recharge + Volume Wastewater}} \qquad \textbf{Equation 1}$$

Using the derived equation shown below (Equation 2), one can calculate housing densities based upon effluent quality, recharge volume, and the ground water quality criteria for NO_3-N which must be achieved. To determine lot size using this model, the following assumptions or facts must be accepted:

- Volume of Recharge for the nitrate dilution model is established using the Recharge values calculated using GSR-32.
- Each home is occupied by 3.5 persons1; and each person generates 75 gallons per day of wastewater2 expressed on an annual basis.
- There is no NO_3-N in the infiltration which recharges ground water
- There are no ground water withdrawals.
- The background ground water quality for NO_3-N is 0.4 mg/L and the nitrate target is 5.2 mg/L, to be consistent with N.J.A.C. 7:9-6 (unless background ground water quality is determined on a site-specific basis through a ground water sampling plan as approved by the Department in writing or when projects are located in Class I aquifers as defined in N.J.A.C. 7:9-6);
- Sewage NO_3-N concentration is 40 mg/l;

The more complete and complex form of the nitrate dilution model[3] is as follows:

$$A_h = \frac{PQ_p(C_s - C_o)}{74.39(C_o R_i)} \qquad \textbf{Equation 2}$$

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[1] The existing guidance uses 3.5 persons per home. Based upon the most recent census data for single family homes on single systems, this number is still appropriate. At some later date, the State Planning Commission may employ a different typical home occupancy constant in accordance with more current demographic information.

[2] The 75 gallons per day value is consistent with current DEP rules in N.J.A.C. 7:9A. It is subject to change in the future in accordance with ongoing policy analyses being developed by NJGS and the Division of Watershed Planning

[3] This model has been often been referred to as the "Wehrman" model or the "Trela/Douglas" Model.

Where:

C_o	=	allowable NO_3-N concentration in ground water (mg/l) as specified in N.J.A.C. 7:9-6
C_s	=	NO_3-N concentration in septage (mg/l)
R_i	=	recharge to ground water (in/yr)
P	=	residents per home (persons/home)
Q_p	=	wastewater discharge (gal/person/day)
A_h	=	Average minimum lot size (acres/home)
74.39	=	Conversion factor to account for converting the infiltration from inches per year to gallons/acre/day[4]
Q_p	=	wastewater discharge (gal/person/day)

The result of the calculation is the average lot size per home, and by dividing average by total area by lot size, one can establish the total number of homes that can be built on a given area of land. For example, when recharge is 12.22 inches per year, the average lot size is 2.42 acres using this equation.

Summary of the Process

The steps to carry out the simplified approach are as follows:

1. Determine the distinct watershed areas
2. Determine the total area and the area that will be used for residential development
3. Determine the recharge for the entire area.

Details of the Process

Step 1: Determining the Watershed areas or Drainage Basins

If more than one watershed or drainage basin exists at the major subdivision, the land area should be segmented and recharge should be calculated for each drainage basin area. This is particularly important when streams or other hydraulic boundaries occur that control the potential mixing of ground water. An example is shown below in Figures 1 and 2. In the maps, the streams that are central to the watershed areas are shown as lines with arrows, and the delineation between watershed polygons is the bold line in Figure 2.

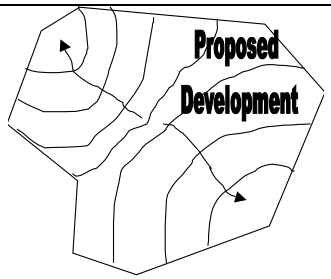


Figure 1. Theoretical subdivision with two watersheds separated by a drainage divide

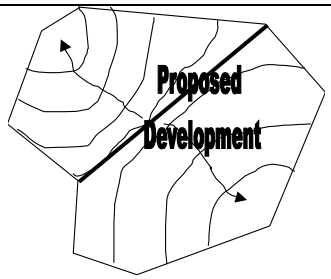


Figure 2. Two watersheds delineated for separate recharge calculations

Step 2: Determining the total area of the residential development

The proposed development must always be evaluated to see that the total area generates enough recharge to dilute the nitrate to 5.2 mg/L. Ultimately, homes can be distributed evenly throughout the property or clustered. In no case however, can more than the maximum number of homes be built on the property, When using clustering, please be aware that in order to protect each individual home form possible contamination from their well or their neighbor's well, the target is 8 mg/L, which is below the drinking

[4] The conversion factor 74.39 is obtained as follows: $\frac{\text{Inches}}{\text{year}} = \frac{\text{gallons}}{\text{acre}*\text{day}} * \frac{365\text{day}}{\text{year}} * \frac{\text{acre}*\text{inch}}{27154.25\text{gallons}} = 74.39$

water standard of 10 mg/L. However, the soils on which the homes are located should be the more permeable ones, so that recharge in the densely occupied areas is at least on a average the same as the overall average recharge.

Step 3: Determining Recharge

Recharge must be determined for each application, because it varies based on soils and climatic factors. The method used to determine ground water recharge is specified in "New Jersey Geologic Survey, Geologic Survey Report GSR-32, A Method for Evaluating Ground Water Recharge Areas in New Jersey, 1993.

Typically, the applicant will obtain soil boundary information from USDA soil maps for the entire development. Then, the applicant will determine the area of each soil group or unit and will assign a recharge value in a table.

The maps generated using the techniques in section II of GSR-32 will be comprised of many groups of polygons sharing common recharge characteristics based upon soil type and land use/land cover designations. GSR-32 outlines two approaches for classifying and ranking ground water recharge areas. In most cases though, an adequate degree of accuracy and precision can be achieved using a simple Thiessen weighted average calculation for annual ground water recharge using the equation below

From the table, a single recharge value is typically established that is used to calculate lot size in accordance with the Equation 2.

This average-weighted approach for classifying ground water recharge for an entire project area is recommended for all projects which do not have highly diverse drainage characteristics as mapped and classified according to section II of GSR-32, and/or do not have dissected drainage (i.e. any area or portion thereof within the project area that gathers water originating as precipitation and contributes it to separate and distinct areas). In these cases, it will be necessary to either use the "Volumetric-Recharge Classification" method outlined in GSR-32, or the property will have to be dissected into separate drainage basins. In either case, development density within the project site would have to be segregated relative to ground water recharge classification or drainage areas.

$$Rc = \sum \left[Rc_1 \times A_1/A + Rc_2 \times A_2/A + \ldots Rc_n \times A_n/A \right]$$

Equation 3[5]

Where:

Rc	=	average weighted annual ground water recharge (in/yr)
Rc_i	=	annual ground water recharge per individual unit or polygon (in/yr)
A	=	total land area available for infiltration (acres)
A_i	=	land area of individual units or polygons (acres) (i = any number 1 through n)

If one uses the spreadsheet supplied by the Department, the site recharge value is calculated automatically.

EXAMPLE CALCULATIONS USING THE SIMPLIFIED APPROACH

The Department recommends that you use the Excel spreadsheet available on the Division of Water Quality Website www.state.nj.us/dep/dwq/sep50mor.htm.

[5] When developing this recharge number, be sure to include all polygons, even if they are equal to zero inches per year. The total acreage must add up to 100% of the area.

Calculating Ground Water Recharge

The equation for calculating an estimate of annual ground water recharge is as follows:

Annual ground Water recharge = (R-Factor x C-Factor x B-Factor) - R-Constant

Where:

- R-Factor is selected from a table (Appendix 4 or 5) in GSR-32 considering Land Use Land Cover Code (LULC) and soil series or soil group
- R-Constant is selected from a table (Appendix 4 or 5) in GSR-32 considering Land Use Land Cover Code and soil series or soil group
- C-Factor is the Climate factor, and it is selected from a table (Appendix 6) in GSR-32, and it is specific to the location of the proposed development.
- B-Factor is a constant of 1.0[6]. A constant of 1.3 may be substituted for those projects located within areas of the New Jersey Coastal Plain as shown in Appendix 9.

Thus, when the soil series is Sassafras, and the LULC code is 4, the R-Factor = 16.61 and the R-Constant = 12.78, and the C-Factor = 1.43 (typical for Middlesex County), the following recharge can be calculated:

Annual ground Water recharge = (16.61 x 1.43 x 1.0) - 12.78

Simplified:

Annual ground Water recharge = 10.97 inches/year

The recharge of 10.97 inches/year is now entered into the Nitrate dilution equation (Equation 2) to determine the number of building lots that can be safely sited without risking contamination of the ground water above the ground water quality standards.

Average Weighted Recharge

In those circumstances when many soils and many polygons are involved, there is a need to establish an area weighted average infiltration or recharge rate. The approach for calculating this is the Thiessen polygon approach, as described in most hydrology textbooks. This simple example should provide adequate guidance for anyone pursuing this approach.

Suppose there are four different polygons, and that both the recharge and the area are known for them all. The following type of table can be constructed. Equation 3 above is followed, whereby the fractional area for each polygon is calculated, and multiplied by the recharge for each polygon. The weighted recharge values are summed and this sum is the Weighted Area Recharge to put into the Equation 2 above.

[6] This is a new modified basin factor constant proposed by NJGS. It is an amended value for GSR-32 For additional information, contact the New Jersey Geologic Survey, 29 Arctic Parkway, P.O. BOX 427, Trenton, NJ 08625 , Phone: (609) 292-1185 , FAX: (609) 633-1004

Table 1. A simple generic example of the approach used to calculate the Thiessen weighted Area recharge

Soil or Polygon Number	Recharge (inches)	Soil or Polygon Area (Acres)	Area Fraction (Polygon Area/Total Area)	Recharge weighted by Fractional Area (Inches) Col 2 * Col 4
1	10	50	0.25	2.5
2	20	50	0.25	5
3	30	50	0.25	7.5
4	40	50	0.25	10
Total		200	1.0	25

Alternatively, it can be laid out as in this example in Table 2, where there are 100 total acres.

Table 2. An example recharge calculation using actual soils recharge data and recharge/land area by the Thiessen weighted area (Table 2) approach.

Soil Name or Recharge Group	AbA	AbB	BuB	BuC	Amwell
LULC	4	4	4	4	4
Recharge factor (Rf)	12.94	12.94	17.86	17.86	0.00
Recharge Constant (Rc)	8.25	8.25	14.12	14.12	0.00
Climate Factor (Cf)	1.52	1.52	1.52	1.52	1.52
Polygon Area (acres)	25.00	25.00	25.00	25.00	25.00
Recharge (in/yr)	11.42	11.42	13.03	13.03	0.00
Recharge per Polygon	2.28	2.28	2.61	2.61	0.00

In this example, the total recharge is the sum of Recharge per polygon Land Area, which is 9.78 inches. This is the same layout used in the recommended spreadsheet as illustrated in Appendix 5 where the calculation for each soil is Recharge X Polygon_Area/Total_Area.

Calculating Number of Lots per Site

The example calculations that follow are for a case where only one soil occurs on site. Situations that are more complex are easily calculated, but if the person preparing the calculation needs assistance, please do not hesitate to call the Department "50 or More" contact.

Using the nitrate dilution (Equation 2) Part II, calculations yield an average lot size of 2.42 acres using the example data in **Table 2**.

Table 3. Example of the results of the average lot size calculation.

C_o	Allowable NO_3-N concentration in ground water discharge (mg/l)	5.2 mg/l
C_s	NO_3-N concentration in septage (mg/l)	40 mg/l
R_I	Recharge to ground water (in/yr)	9.78 in/yr
P	Residents per home (persons/home)	3.5 persons/home
Q_p	Wastewater discharge (gal/person/day)	75
A_h	Average lot size (acres/home)	2.42

In order to enable clustering, one can conduct two sets of calculations. First, the nitrate target of 5.2 shall be used to establish the maximum number of houses that can occupy the entire site. Like in Table 4, a second calculation can be conducted using the target of 8.0 mg/L expressed over the actual area where houses will be built. Using this approach, calculations yield a minimum lot size of 2.14 acres when the soil is Sassafras, and when the LULC is 4, and when the climate factor is 1.43. This means that for this site, average lot size

may be larger than the minimum lot size, but the minimum lot size is adequate to protect against any one home exerting a profound effect on an adjacent home.

Table 4. Example of the results of the minimum lot size calculation.

C_o	Maximum allowable NO_3-N concentration in ground water discharge (mg/l) when clustering is utilized	8.0 mg/l
C_s	NO_3-N concentration in septage (mg/l)	40 mg/l
R_I	Recharge to ground water (in/yr)	9.78 in/yr
P	Residents per home (persons/home)	3.5 persons/home
Q_p	Wastewater discharge (gal/person/day)	75
A_h	Minimum lot size (acres/home)	1.44

Conclusion

It might take a little effort to become completely familiar with this approach, but it is really quite simple, especially when you use the Department developed spreadsheet. Please do not hesitate to call the BNPC at 609-633-7021 and ask for assistance if you pursue this approach.

Part III. APPLICATION REQUIREMENTS

Application Information

An application to obtain Certification of sewerage facilities for subdivisions involving 50 or more realty improvements using the "*Simplified Approach"* discussed herein shall ONLY include the below listed information and that requested on the Supplemental Information for Application Preparation Sheet. No additional information will be accepted. ***Any information submitted that is illegible, too small a scale or typing font will be automatically marked "Administratively Deficient" and returned for correction.***

Please submit:

1. A completed Treatment Works Approval Permit Application, Form (TWA-1). This form is available on the internet at http://www.state.nj.us/dep/dwq/forms.htm

2. Engineering plans signed and sealed by a professional engineer licensed to practice in New Jersey, including:

   A. A Plot Plan (**on one sheet**) of the entire site showing: name of project, municipality, lot and block designations, location of proposed lots, and location of boundaries of land not intended for development (e.g. easements, wetlands, floodplains and dedicated open space, etc.); the location of streams, ponds, and springs on and within 100 feet of the boundaries of the site. These boundaries must be approved by the DEP Land Use Regulation Program or have a statement of no jurisdiction in lieu of an approval;
   B. A Final Grading and Drainage Plan (**on one sheet**) showing final site grading elevations and contours (**minimum 2 foot contours**);
   C. A Topographic Plan (**on one sheet**) showing all elevations (**minimum 2 foot contours**) of the pre-developed site along with any distinct watershed areas delineated within the site to show dissected drainage;
   D. A Test Pit/Septic System Location Plan (**on one sheet**) showing the location of all soil test pits, borings and percolation/permeability tests, and any other tests/evaluations conducted onsite;

3. A Fact Sheet (**on one, separate sheet of paper**) can be enclosed separately or with the cover letter. It must list the below project data:

   A. total project acreage,

   B. total wetland & surface water bodies acreage,

   C. total open space acreage (i.e. land not to be built upon & not wetlands or open water),

   D. total project land area available for infiltration – downgradient from houses - (by each project watershed basin – if more than one watershed {i.e. dissected drainage} in project area),

   E. local zoning schedule for type of project requesting Certification,

   F. total number of houses requested in Certification,

   G. minimum lot size requested in Certification,

   H. a statement specifying the mechanism for providing potable water at the proposed subdivision;

All soil logs, boring logs and percolation/permeability test results, and any other results of soil/geohydrologic tests/evaluations conducted onsite;

5. Government Agency Mapping:
    A. United States Geologic Survey (USGS) Topographic Quadrangle with site boundaries outlined.
    B. United States Department of Agriculture (USDA) Soil Conservation Service County Soil Survey Sheet(s) with site boundaries outlined.
    C. United States Department of the Interior, Fish and Wildlife Services National Wetland Inventory Quadrangles with site boundaries outlined.

6. Ground Water Recharge Mapping Series as described in GSR-32, section II:(e.g. source data maps, composite OVERLAYS and recharge base map). Use 81/2" x 11" mylar (acetate) sheets, 1 EACH for each of the below categories:
    A. Project site soils
    B. LULC codes
    C. Recharge areas

7. Ground Water Recharge Spreadsheet (completed according to the directions in GSR-32). including: See Part VII for an example, plus visit our Website on the internet at http://www.state.nj.us/dep/dwq for our example (M/S Excel software). The spreadsheet should show:
    A. Polygon Codes (no polygons should be less than 2 acres in area)
    B. Land Use/Land Cover Codes (for the intended development – NOT pre-development)
    C. Soil Group/Type
    D. Basin factor is now 1.0
    E. R-Factor
    F. R-Constant
    G. C-Factor
    H. Estimated Recharge (in/yr)

8. Nitrate dilution calculations demonstrating maximum number of lots that can be accommodated while remaining in compliance with the New Jersey Ground Water Quality Standards (GWQS) and following guidelines in this document.

9. All final data and calculations of annual ground water recharge, nitrate dilution, and minimum lot size.

10 Written documentation from the relevant township or municipality indicating that the project complies with local zoning, planning and environmental ordinances and if applicable, all local master plan requirements. If the project is in Burlington, Ocean, Atlantic, or Cape May Counties, you will need to provide an affirmative statement that the project does not occur in the Pinelands area. If it does occur in the Pinelands area, please submit documentation from the Pinelands Commission that indicates that the development is consistent with their requirements.

APPENDICES

Appendix 1. A SELF-CHECK SUBMISSION PREPARATION LIST

50+ Realty Improvements Application Submission

SELF-CHECK

Submission Preparation List

This sheet is provided for your personal use in preparing your 50+ submission

GENERAL

- ☐ I have a complete 50+ Application Package to use for my submission.
- ☐ I understand the 50+ Guidance Document including all appendices.
- ☐ I understand the Simplified Nitrate Dilution Model Approach.
- ☐ I understand that no alternative methods to the Simplified Approach will be permitted for Nitrate Dilution calculation.
- ☐ I have a copy of GSR-32.
- ☐ I understand that **NO** Fee is required for a 50+ Certification submission.
- ☐ I understand time frames for application submission and appointments.
- ☐ I understand that I do **NOT** need to send copies of state or federal rules and regulations with my submission.

APPLICATION "PACKAGE" INCLUSIONS

- ☐ Cover Letter or Transmittal Sheet
- ☐ Fact Sheet (one sheet)
- ☐ TWA-1 Application (signed & dated)
- ☐ Plot Plan (one sheet)Dilution Model calculations
- ☐ Final G & D Plan (one sheet)
- ☐ Topographic Plan (one sheet)
- ☐ Test Pit/Septic System Location Plan (one page)
- ☐ Government Agency Mapping of:__ USGS Topo Quadrangle, __ USDA - SCS Soil
- ☐ Survey Sheet(s) __ USDI National Wetland Inventory Quadrangle
- ☐ Mylar Overlays of: __ LULC (post-development) codes, __ Project Site Soils
- ☐ __ Recharge Areas Spreadsheet
- ☐ Nitrogen Dilution calculations
- ☐ Final ground water recharge data, calculations and minimum lot size
- ☐ Pinelands Commission documentation (Burlington, Ocean, Atlantic & Cape May counties)
- ☐ Written documentation from township (project compliance with all local ordinances & master plan requirements)
- ☐ Attachments

6/02

Appendix 2. SUPPLEMENTAL INFORMATION FOR APPLICATION PREPARATION

50 or More Realty Improvement Certifications

All applicants are asked to use this supplemental information in conjunction with the instructions given in the main body of this document. Use of the other appendices will also assist in application preparation.

IMPORTANT REMINDER:

Automatic Administrative Denial will result when:

1. Review staff can not read/understand **any** part of the submission (i.e. any part is ***illegible, too small a scale or typing font, poor photocopying quality, etc.***)
2. Applicant failed to use the *"Simplified Nitrate Dilution Model Approach"*.

Some other common reasons for Administrative Denial are:

1. Incomplete information on the application
2. Missing portions of submittal package (special note to municipal documents and/or Pinelands information must be included as applicable)
3. Missing signatures
4. Submitting an overly complicated application (i.e. sending in too much material - more than was asked for in the instructions)
5. Failure to follow any of the instructions in C. Application Preparation, Numbers 1 through 10. Document.

GENERAL SUGGESTIONS:

PLAN AHEAD - do not procrastinate - do not submit applications at the last minute and expect instantaneous service. The 50+ Certification Program is not a "walk-in" or "over-the-counter" type of process. Allow at least 30 working days (from date of receipt of submission by the Bureau) for review. If the guidance document instructions have been followed and the submission is Administratively Complete, our usual review time is less than 30 days.

Read the entire 50+ Guidance Document **completely -** BEFORE working on your submission package. Call this office with any questions. Calling may avoid the need for a pre-meeting or save the submission from being Administratively Denied and returned.

SPECIFIC SUGGESTIONS:

The application typing, map wording or any labels are to be no smaller than 10pt. Type.

Color maps and/or drawings are not required.

CAD drawings are not required.

Minimal engineering plans are to be submitted in accordance with guidance document instructions. Do NOT submit unnecessary plans (e.g. road profiles, utility drawings, landscape plans, lighting schemes, etc.)

Grading and drainage plans are to be FINAL - preliminary plans will not be acceptable.

Use single sheets (whenever possible) for all engineering plans. See Part C. 2 - Application Requirements in the main body of the guidance document.

Double check the Recharge Spreadsheet numbers taken from GSR-32, Appendix IV. Look for transposition errors.

Raw data will only be accepted on a computer diskette.

Calculate recharge using a Basin Factor of 1.0.

Determine LULC Codes on **POST DEVELOPMENT** grading and landscaping not on the pre-construction, undeveloped site. This is what the site will look like after all construction has been completed and occupancy/use has started.

Do not submit polygons smaller than 2 acres.

Refer to the calculation and model examples in the guidance document when determining your nitrogen dilution figures.

Use good quality photocopying (especially with the soils maps).

DO NOT SUBMIT COPIES OF NJDEP RULES, REGULATIONS, GSR-32 OR ANY OTHER GOVERNMENT DOCUMENTS!

The separate Fact Sheet is an official part of the application submission and must be complete. Follow the sample shown in the Appendix III-D.

The Cover Letter (or Transmittal Sheet) must include a listing of ALL enclosures being submitted.

NO COPIES ARE REQUIRED for the Department. This office only requires the original package with original forms and signatures.

Appendix 3. GLOSSARY

50+ Realty Improvements Application Submission

(The select definitions listed in this Glossary are intended for use only with 50+ Application Submissions. They are **NOT** official Department definitions. They are only intended to clarify certain 50+ application processes and not refer to or impact any other Department rules or regulations.)

1. **Basin Factor** means a constant number of 1.0 used in calculating recharge. It is a new modified number by NJGS and is an amended value for GSR-32. For projects located in areas of the New Jersey Coastal Plain, a basin factor of 1.3 may be used in lieu of 1.0. This variation is based upon various studies that have been conducted as identified in Appendix 8 that show that while a basin factor of 1.0 was most appropriate in the studies conducted in the northern areas of the State, coastal plain areas yielded less variability when using the Sliding interval methodology vs. using the Posten method. This, coupled with the idea that there is variability between different areas of New Jersey, it is shown that a basin factor of 1.3 may be more appropriate in the coastal plain provinces.

2. **Dissected Watershed** means any area or portion thereof within a project area that gathers water originating as precipitation and contributes it to separate and distinct areas.

3. **Infiltration Area** means that land within the project area where water will percolate into the subsoil.

4. **Non-infiltration Area** means any area within the project area where water will not percolate into the subsoil.

5. **Open space** means that portion of the project area where no development will occur and is guaranteed by municipal ordinance or project covenant to remain as such in perpetuity.

6. **Polygon** means areas (no smaller than 2 acres for 50+ submissions) within the project that share common recharge characteristics based upon soil types and land use/land cover designations.

7. **Project Area** means the total site acreage submitted for Certification.

8. **Surface Water Body (i.e. open water)** means any spring, stream, river, lake, pond, wetland or artificial water body at or above the lands surface. Flow rate or frequency (constant or intermittent) has no affect.

9. **Wetlands** means those areas saturated by surface or ground water at a frequency and duration to support hydrophilic vegetation.

Appendix 4. SAMPLE FACT SHEET

50+ Realty Improvements Application Submission

1. This sheet is a mandatory submission.
2. Failure to include it with a submission will cause an automatic "Administrative Denial".
3. Attachments are to be kept to a minimum number of pages.
4. Keep this form as an individual document and separate form all other information.

==========

Company Letterhead

Inside Address: }

Date

RE: 50+ Fact Sheet for: (name the project, block & lot numbers and city/township, state & zip)

Dear Mr. Chalofsky:

This Fact Sheet is submitted for the above referenced project as part of the requirements for 50+ Certification Application Program.

(Name of project) has:

A. _____ total project acres;

B. _____ total acres of wetland & surface water bodies;

C. _____ total open space acres (i.e. land not to be built upon & not wetlands or open water);

D. _____ acres of total project land area available for infiltration (by each project watershed basin if more than one watershed in project area, i.e. dissected drainage);

E. _____ attached the local zoning schedule for type of project under this Certification submission;

F. _____ total number of houses to be constructed under this Certification submission;

G. _____ acres as the minimum lot size being requested under this Certification;

H. _____ as the minimum number of lots being requested under this Certification;

I. _____ attached written documentation of:
- ___ compliance with local ordinances
- ___ local master plan requirements
- ___ Pinelands Commission (Burlington, Ocean, Atlantic & Cape May counties only)

J. Project's houses will get potable water from: □ individual house wells □ public supply

Signatory: }

Attachments:

Appendix 5. SPREADSHEET EXAMPLE OF A NITROGEN DILUTION AND LOT SIZE CALCULATION

Project Name	Fill in the Name Here				
Project Location	Fill in the location here				
Lot and Block	Fill in the lot and block information here				
Fill in as many Soil Types as needed up to column "AA" (Click the "Add New Soil" button to create additional ones)					
Soil Name or Recharge Group	AbA	AbB	BuB	BuC	Amwell
LULC	4	4	4	4	4
Recharge factor (Rf)	12.94	12.94	17.86	17.86	0.00
Recharge Constant (Rc)	8.25	8.25	14.12	14.12	0.00
Climate Factor (Cf)	1.52	1.52	1.52	1.52	1.52
Polygon Area (acres)	25.00	25.00	25.00	25.00	25.00
Recharge (in/yr)	11.42	11.42	13.03	13.03	0.00
Recharge per Polygon	2.2838	2.2838	2.6054	2.6054	0.0000
Calculated Sum of Project Acres	125.00				
Average Weighted Infiltration (In/yr)	9.78				
Target Nitrate Concentration	5.20				
Maximum Nitrate Concentration	8.00				
Basin Factor (Constant)	1.00				
Average Lot Size (acres/home)	2.42				
Minimum Lot Size (acres/home)	1.44				
Maximum number of homes	51.76				

A complete version of this spreadsheet can be downloaded from
http://www.state.nj.us/dep/dwq/sep50mor.htm

Appendix 6. HELPFUL TELEPHONE NUMBERS FOR 50 OR MORE REALTY IMPROVEMENT APPLICATIONS

AGENCIES	*Telephone*	*Fax*
Bureau of Nonpoint Pollution Control (BNPC	***(609) 633-7021***	***(609) 984-2147***
New Jersey Geological Survey (NJGS	***(609) 292-1185***	
New Jersey Maps & Publications Office (sales	***(609) 777-1038***	
Land Use Regulation Program	***(609) 292-0060***	***(609) 292-8115***
US Soil Conservation Service (SCS	***(732) 246-1171***	
NJ State Soil Conservation Committee (SSCC)	***(609) 292-5540***	

PUBLICATIONS

NJGS GSR – 32, **"A Method for Evaluating Ground Water Recharge Areas in New Jersey, 1993",** *$10.00/copy*, ***NJ DEP Maps & Publications Office***

NJ Ground Water Protection (NJPDES) Regulations, N.J.A.C. 7:14A-1, et seq.

Internet, http://www.state.nj.us/dep/dwq/rules.htm

NJ Ground Water Quality Standards, N.J.A.C. 7:9-6

West Group Customer Support, *Tele: 1-800-808-9378*

Internet, http://www.state.nj.us/dep/dwq/pdf/njac79-6.pdf***.***

NJ Standards for Individual Subsurface Disposal ("Chapter 199"), N.J.A.C. 7:9A

NJ DEP Maps & Publications Office Internet, http://www.state.nj.us/dep/dwq/rules.htm

NJ Realty Improvement Sewerage and Facilities Act (1954), N.J.S.A. 58:11-25.1

State and County libraries

NJDEP Field Sampling Procedures Manual, ***NJ DEP Maps & Publications Office***

United States Geological Survey (USGS) Topographic Quadrangle Sheets ***(1:24,000 scale)***

NJ DEP Maps & Publications Office, many large sporting goods stores, Internet at www.ugs.gov

United States Department of Agriculture (USDA) Soil Conservation Service (SCS), County Soil Survey Sheets , ***Local Soil Conservation District (see Part V)***

United States Department of the Interior (USDOI), Fish and Wildlife Services (F&WS) National Wetland Inventory Quadrangles ***(1:24,000 scale), NJDEP Maps & Publications Office***

NJ Freshwater Wetlands Maps, ***NJDEP Maps & Publications Office***

Ground Water Recharge Mapping Series, ***NJGS GSR – 32, Section II***

Orthophotographic Quadrangles ***(register to 1:24,000)***

MARKHURD at 1 - 800 - 627 - 4873 or NJ DEP Maps & Publications (for diazo prints)

Ask at Maps & Publications about CDRom prices for any mapping needs

Appendix 7.SOIL CONSERVATION DISTRICTS IN NEW JERSEY

DISTRICT	ADDRESS	TELEPHONE	FAX
Bergen County	327 Ridgewod Avenue Paramus, NJ 07652	(201) 261- 4407 or (973) 538-1552	(201) 261-7573
Burlington County	Tiffany Square, Suite 1002615 Route 38 – RD 2 Mount Holly, NJ 08060	(609) 267–7410 or (609) 267-0811*	(609) 267-3347
Camden County	403 Commerce Lane, Suite 1 West Berlin, NJ 08091	(856) 767- 6299 or (609) 205-1225*	(856) 767-1676
Cape-Atlantic	Atlantic County Office Building6260 Old Harding Highway Mays Landing, NJ 08330	(609) 625-3144 or (609) 205-1225*	609) 625-7360
Cumberland County	PO Box 144, Route 77 Deerfield, NJ 08313	(856) 451-2422 or (856) 205-1225*	(856) 451-1358
Freehold (Middlesex & Monmouth Counties)	211 Freehold Road Manalapan, NJ 07726	732) 446-2300 or (732) 462-1079*	(732) 446-9140
Gloucester County	Kandle Center, 72 East Holly Ave Pitman, NJ 08071	(856) 589-5250 or (856) 769-2790*	(856) 256-0488
Hudson, Essex & Passaic	15 Bloomfield Avenue North Caldwell, NJ 07006	(973) 364-0786 or (973) 538-1552	(973) 364-0784
Hunterdon County	Community Services Annex 8 Gauntt Place Flemington, NJ 08822	(908) 788-1397 or (908) 735-0737*	(908) 788-0795
Mercer County	508 Hughes Drive Hamilton Square, NJ 08690	(609) 586-9603 or (732) 462-1079*	609) 586-1117
Morris County	Courthouse, POB 900 Morristown, NJ 07960(physical location – 560 W. Hanover Ave., Morris Township)	(973) 285-2953 or (908) 735-0737*	(973) 285-8345
Ocean County	714 Lacey Road Forked River, NJ 08731	(609) 971-7002 or (609) 267-0811*	(609) 971-3391
Salem County	PO Box 168 Deerfield, NJ 08313	(856) 769-1124 or (609) 205-1225*	(856) 451-1358
Somerset-Union	Somerset County 4-H Center 308 Milltown Road Bridgewater, NJ 08807	(908) 526-2701 or (908) 782-4614*	(908) 526-7017
Sussex County	186 Halsey Road, Suite 2 Newton, NJ 07860	(973) 579-5074 or (908) 735-0737*	(973) 579-7846
Warren County	224 STIGER STREET HACKETTSTOWN, NJ 07840	(908) 852-2579 or (908) 735-0737*	(908) 852-2284

*** Natural Resource Conservation Service Field Office**

STATE SOIL CONSERVATION COMMITTEE

NEW JERSEY DEPARTMENT OF AGRICULTURE
PO BOX 330,
TRENTON, NJ 08625
Tele:(609) 292-5540 Fax:(609) 633-7229

New Jersey Geological Survey
Technical Memorandum 99-1

Basin Factor Calibration for Ground-Water Recharge Estimation

by Jeffrey L. Hoffman

(Supplement to GSR 32: *A method for evaluating ground-water-recharge areas in New Jersey*)

The New Jersey Geological Survey's methodology for estimating ground-water recharge on parcels of land five acres or larger (Charles and others, 1993) contains a calibration constant referred to as the "basin factor." As part of the method's development, recharge over the test area (in Morris County) was compared to an estimate of stream baseflow from the same area. The report states:

> "Calibration of calculated volumetric recharge to estimated stream baseflows for test basins indicated the need to modify recharge. The basin factor was added to the recharge equation to meet this goal. Baseflow is a measure of ground-water discharge to streams, and, over the long term, a viable estimate of ground-water recharge.
>
> "The calibration process indicated that a constant of 1.3 resulted in basin-wide recharge volumes in line with observed stream baseflows. More detailed analyses may show that different basins may require different basin factors. The accuracy of this adjustment depends on the exact relationship between stream baseflows and the distribution of ground-water recharge."

For the initial calibration, baseflow was estimated using the sliding-interval method (Pettyjohn and Henning, 1979). This method was also used to estimate baseflows for New Jersey's current statewide water-supply plan (CH2M Hill and others, 1992). The NJ Geological Survey has determined that the sliding interval method may overestimate long-term ground-water baseflow to streams (J. Boyle, NJ Geological Survey, oral commun., 1999). A more appropriate baseflow estimate comes from a method developed by Posten (1984) and results in values about a third lower than those from the sliding-interval method.

The NJ Geological Survey has recently mapped ground-water recharge rates for several areas in New Jersey. This work allows for a comparsion of baseflow and recharge calculations. Table 1 lists baseflow from the sliding-interval and Posten methods at three gaging stations: the Whippany River at Morristown, the Rockaway River above the Boonton Reservoir, and the Manasquan River at Squankum. Table 2 shows estimated net ground-water recharge over the basins assuming different basin factors. It is clear that using a basin factor of 1.3 overestimates the Posten values of stream baseflow. A basin factor of 1.0 results in a better match.

Based on this research, and in the absence of local baseflow information, the NJ Geological Survey now recommends applying a basin factor of 1.0 when using the methodology developed by Charles and others (1993). If additional research establishes that a different baseflow estimation technology is more appropriate, then use of another basin factor may be necessary. Additionally, watersheds of varying size, geology or land use may require different basin factors to match net ground-water recharge with baseflow.

References:

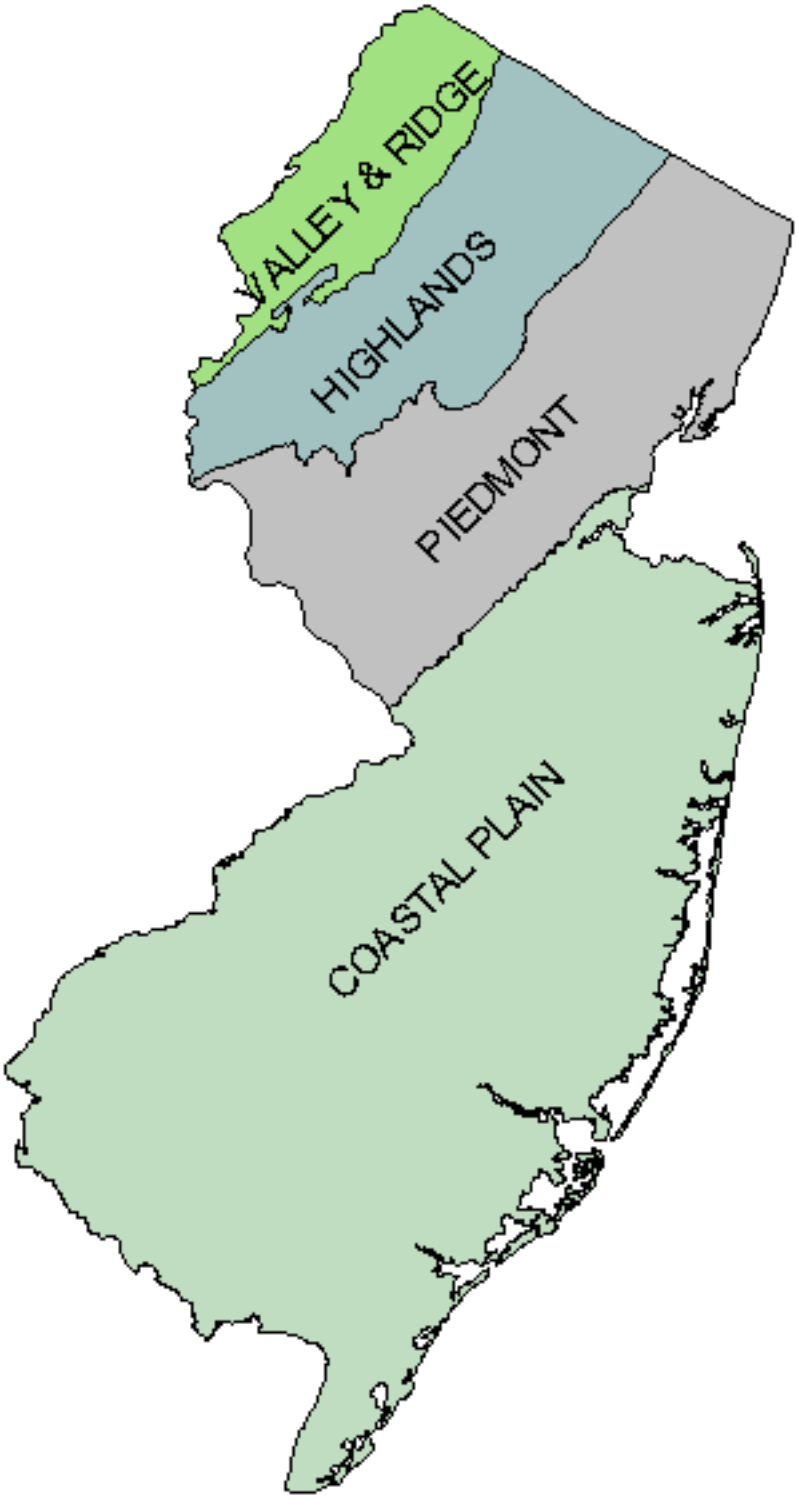
Charles, E.G., Behroozi, Cyrus, Schooley, Jack and Hoffman, J.L., 1993, A method for evaluating ground-water-recharge areas in New Jersey: NJ Geological Survey Report GSR 32, 95p.

CH2M Hill, Metcalf & Eddy, Inc., and New Jersey First, Inc., 1992, New Jersey statewide water supply master plan, task 2 report, water supply baseline data development and analysis: Consultant's report prepared for the N.J. Department of Environmental Protection, variously paginated.

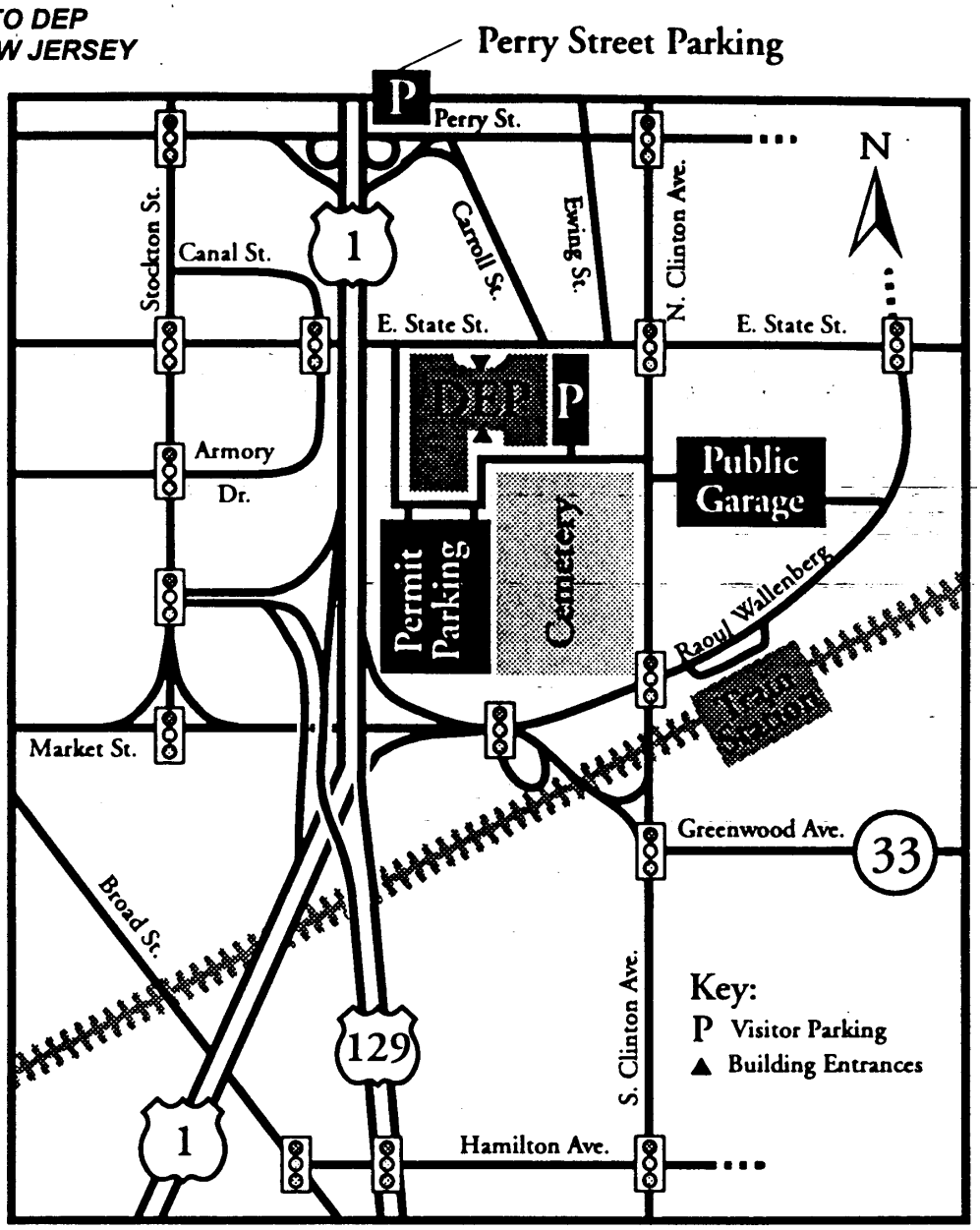
Pettyjohn, W.A. and Henning, R.J., 1979, Preliminary estimate of regional effective ground-water recharge rates in Ohio: Ohio State University Water Resources Center, Columbus, 241p.

Posten, S.E., 1984, Estimation of mean groundwater runoff in hard-rock aquifers of New Jersey: Columbia University seminar series on pollution and water resources, v. 16, Halasi-Kun, G.J., editor, Pergamon Press, NY, p.109-154.

Appendix 9. NEW JERSEY PROVINCES



DIRECTIONS TO DEP
TRENTON, NEW JERSEY



Directions from North Jersey:
Take the New Jersey Turnpike to Exit 9 - New Brunswick to Route 1 South. Follow Route 1 South to Trenton and take the exit for Perry Street. At the top of the ramp make a right onto Perry Street, go over Route 1 and make a right onto Carroll Street. Follow that road one block to East State Street and make a right onto East State Street. DEP headquarters will be on your left.

Directions from South Jersey:
Take 295 North to Exit 60 - Trenton, Route 129. Stay in the left lane and follow Route 129 towards Trenton. It will turn into Route 1 after the Hamilton Ave. exit. Take the exit for Perry Street. At the top of the ramp, bear right onto Carroll Street. Follow that road up one block to East State Street and make a right onto East State Street. DEP headquarters will be on your left.

Directions from the East/Shore Areas:
Take 195 West until the road splits into 295 North or Route 129. Bear to the left, follow Route 129 towards Trenton. It will turn into Route 1 after the Hamilton Ave. exit. Take the exit for Perry Street. At the top of the ramp, bear right onto Carroll Street. Follow that road up one block to East State Street and make a right onto East State Street. DEP headquarters will be on your left.