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CHAPTER 1D

GENERAL PRACTICE AND PROCEDURE

Authority

N.J.S.A. 13:1B-3(d), 13:1B-3(e), 13:1B-5(a),
13:1K-15 et seq., and 52:14B-4(b).

Source and Effective Date

R.1995 d.480, effective August 7, 1995.
See: 27 N.J.R. 2332(a), 27 N.J.R. 3399(b).

Executive Order No. 66(1978) Expiration Date

Chapter 1D, General Practice and Procedure, expires August 7, 2000.

Chapter Historical Note

Chapter 1D, Agricultural Preserve Demonstration Program, was adopted as R.1977 d.20, effective January 26, 1977. See: 8 N.J.R. 506(a), 9 N.J.R. 62(b).

Chapter 1D, Agricultural Preserve Demonstration Program, was repealed by R.1980 d.433, effective October 7, 1980. See: 12 N.J.R. 454(b), 12 N.J.R. 643(a).

Chapter 1D, Allocation of Water Supply Costs for Emergency Water Projects, was adopted as R.1983 d.639, effective January 17, 1984. See: 15 N.J.R. 117(a), 16 N.J.R. 130(b).

Pursuant to Executive Order No. 66(1978), Chapter 1D, Allocation of Water Supply Costs for Emergency Water Projects, was readopted as R.1988 d.589, effective November 28, 1988. See: 20 N.J.R. 2197(a), 20 N.J.R. 3135(a).

Pursuant to Executive Order No. 66(1978), Chapter 1D, Allocation of Water Supply Costs for Emergency Water Projects, was readopted as R.1993 d.497, effective September 13, 1993. See: 25 N.J.R. 2635(b), 25 N.J.R. 4595(a). Pursuant to Executive Order No. 66(1978), Chapter 1D expired on September 13, 1998.

Chapter 1D, General Practice and Procedure, was originally codified in Chapter 1 of Title 7 as N.J.A.C. 7:1-1.2, Procedure to petition for a rule, Subchapter 5, Debarment, Suspension and Disqualification from Department Contracting, and Appendix A, Mapping and Digital Data Standards. Chapter 1, Rules of Practice and Procedure, became effective prior to September 1, 1969.

Subchapter 5, Debarment, Suspension, and Disqualification from Department Contracting, of Chapter 1, Rules of Practice and Procedure, was adopted as R.1976 d.318, effective October 13, 1976. See: 8 N.J.R. 375(b), 8 N.J.R. 510(c).

Pursuant to Executive Order No. 66(1978), Chapter 1, Rules of Practice and Procedure, was readopted as R.1990 d.457, effective August 15, 1990. See: 22 N.J.R. 1457(a), 22 N.J.R. 2965(a).

Subchapter 1, General Provisions of the Department of Environmental Protection, was repealed and Subchapter 1, General Provisions of the Department of Protection, was adopted as new rules by R.1992 d.441, effective October 9, 1992. See: 24 N.J.R. 4085(a).

Pursuant to Executive Order No. 66(1978), Chapter 1, Rules of Practice and Procedure, was readopted as R.1995 d.480, effective August 7, 1995. See: 27 N.J.R. 2332(a), 27 N.J.R. 3399(b).

N.J.A.C. 7:1-1.2, Procedure to petition for a rule, Subchapter 5, Debarment, Suspension and Disqualification from Department Contracting, and Appendix A, Mapping and Digital Data Standards, of Chapter 1, Rules of Practice and Procedure, were recodified as N.J.A.C. 7:1D by administrative change. See: 32 N.J.R. 1796(a).

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SUBCHAPTER 1. PETITIONS FOR RULES

7:1D-1.1 Procedure to petition for a rule

(a) Unless otherwise provided in Title 7 of the New Jersey Administrative Code, this section shall constitute the Department of Environmental Protection's rules regarding the disposition of all requests for rulemaking pursuant to N.J.S.A. 52:14B-4(f).

(b) Any interested person may petition the Department of Environmental Protection to promulgate, amend or repeal any rule of the Department of Environmental Protection. Such petition must be in writing, signed by the petitioner, and must state clearly and concisely:

1. The full name and address of the petitioner;
2. The substance or nature of the rulemaking which is requested;
3. The reasons for the request;
4. The petitioner's interest in the request, including any relevant organization affiliation or economic interest;
5. The statutory authority under which the Department of Environmental Protection may take the requested action; and
6. Existing Federal or State statutes and rules which the petitioner believes may be pertinent to the request.

(c) Petitions for the promulgation, amendment or repeal of a rule by the Department of Environmental Protection shall be addressed to:

Department of Environmental Protection
 PO Box 402
 Trenton, New Jersey 08625-0402
 Attention: Administrative Practice Officer

(d) Any document submitted to the Department of Environmental Protection that is not in substantial compliance with this section shall not be deemed to be a petition for rulemaking requiring further agency action.

(e) Upon receipt by the Department of a petition for rulemaking, the following shall occur:

1. The petition shall be dated, stamped and logged;
2. The petition shall be referred to the relevant Department division or other Department office, as appropriate; and
3. A notice of petition shall be prepared and filed within 15 days of receipt with the Office of Administrative Law in compliance with N.J.A.C. 1:30-3.6(a).

(f) Within 30 days following receipt of a petition, the Department shall mail to the petitioner and file with the Office of Administrative Law for publication in the New Jersey Register a notice of action on the petition which shall contain the information prescribed by N.J.A.C. 1:30-3.6(b).

(g) In accordance with N.J.A.C. 1:30-3.6(c), the Department's action on a petition may include:

1. Denial of the petition;
2. Filing a notice of proposed rule or a notice of pre-proposal for a rule with the Office of Administrative Law; or
3. Referral of the matter for further deliberations, the nature of which shall be specified and which shall conclude upon a specified date. The results of these further deliberations shall be mailed to the petitioner and shall be submitted to the Office of Administrative Law for publication in the New Jersey Register.

New Rule, R.1989 d.419, effective August 7, 1989.
 See: 21 N.J.R. 102(a), 21 N.J.R. 2302(a).
 Notice of Action of Petition for Safe Drinking Water Act regulations.
 See: 22 N.J.R. 2364(c).

SUBCHAPTER 2. DEBARMENT, SUSPENSION AND DISQUALIFICATION FROM DEPARTMENT CONTRACTING

7:1D-2.1 Definitions

The following words and terms, when used in this subchapter, shall have the following meanings, unless the context clearly indicates otherwise.

“Affiliates” means persons having an overt or covert relationship such that any one of them directly or indirectly controls or has the power to control another.

“Commissioner” means the Commissioner of the Department of Environmental Protection.

“Debarment” means an exclusion from contracting, on the basis of a lack of responsibility evidenced by an offense, failure, or inadequacy of performance, for a reasonable period of time commensurate with the seriousness of the offense, failure or inadequacy of performance.

“Department” means the Department of Environmental Protection.

“DEP contracting” means any arrangement giving rise to an obligation to supply any thing to or perform any service for the Department of Environmental Protection, other than by virtue of State employment, or to supply any thing to or perform any service for a private person where the DEP provides substantial financial assistance and retains the right to approve or disapprove the nature or quality of the goods or service or the persons who may supply or perform the same.

“Disqualification” means a debarment or a suspension which denies or revokes a qualification to bid or otherwise engage in DEP contracting which has been granted or applied for pursuant to statute, or rules and regulations.

“Person” means any natural person, company, firm association, corporation, or other entity.

“State” means the State of New Jersey, or any of the departments or agencies in the executive branch of government with the lawful authority to engage in contracting.

“Suspension” means an exclusion from DEP contracting for a temporary period of time, pending the completion of an investigation of legal proceedings.

7:1D-2.2 Causes for debarment

(a) The Department of Environmental Protection shall debar a person in the public interest for any of the following causes:

1. Commission of a criminal offense as an incident to obtaining or attempting to obtain a public or private contract, or subcontract thereunder, or in the performance of such contract or subcontract;
2. Violation of the Federal Organized Crime Control Act of 1970, or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, perjury, false swearing, receiving stolen property, obstruction of justice, or any other offense indicating a lack of business integrity or honesty;

3. Violation of the Federal or State antitrust statutes, or of the Federal Anti-Kickback Act (18 U.S.C. 874, 40 U.S.C. 276b, c);

4. Violations of any of the laws governing the conduct of elections of the State of New Jersey or of its political subdivisions;

5. Violation of the Law Against Discrimination (P.L. 1945, c.169, C.10:5-1 et seq., as supplemented by P.L. 1975, c.127), or of the act banning discrimination by industries engaged in defense work in the employment of persons therein (C.114, L.1942, C.10:1-10 et seq.);

6. Violations of any laws governing hours of labor, minimum wage standards, prevailing wage standards, discrimination in wages, or child labor;

7. Violations of any laws governing the conduct of occupations or professions or regulated industries;

8. Willful failure to perform in accordance with contract specifications or within contractual time limits;

9. A record of failure to perform or of unsatisfactory performance in accordance with the terms of one or more contracts, provided that such failure or unsatisfactory performance has occurred within a reasonable time preceding the determination to debar and was caused by acts within the control of the person debarred;

10. Violation of contractual or statutory provisions regulating contingent fees;

11. Any other cause affecting responsibility as a State contractor of such serious and compelling nature as may be determined by the department to warrant debarment, including such conduct as may be prescribed by the laws or contracts enumerated in this paragraph even if such conduct has not been or may not be prosecuted as violations of such laws or contracts;

12. Debarment by some other department or agency in the executive branch.

7:1D-2.3 Conditions for debarment

(a) Debarment from department contracting shall be made only by the commissioner, except as otherwise provided by law.

(b) The existence of any of the causes set forth in section 2 of this subchapter shall not necessarily require that a person be debarred. In each instance, the decision to debar shall be made within the discretion of the head of the department or agency unless otherwise required by law, and shall be rendered in the best interests of the State.

(c) All mitigating factors shall be considered in determining the seriousness of the offense, failure or inadequacy of performance and in deciding whether debarment is warranted.

(d) The existence of a cause set forth in section 2(a)1 through 7 of this subchapter shall be established upon the rendering of a final judgment or conviction by a court of competent jurisdiction or by an administrative agency empowered to render such judgment. In the event an appeal taken from such judgment or conviction results in reversal thereof, the debarment shall be removed upon the request of the debarred person unless other cause for debarment exists.

(e) The existence of a cause set forth in section 2(a)8 through 11 of this subchapter shall be established by evidence which the department or agency determines to be clear and convincing in nature.

(f) Debarment for the cause set forth in section 2(a)12 of this subchapter shall be proper provided that one of the remaining causes set forth in section 2 of this subchapter was the basis for debarment by the original debarring agency. Such debarment may be based entirely on the record of facts obtained by the original debarring agency, or upon a combination of such facts and additional facts.

7:1D-2.4 Procedures, period and scope of debarment

(a) When the Department or any agency within its control or jurisdiction seeks to debar a person or his affiliates, the person or persons shall be furnished with a written notice stating that:

1. Debarment is being considered;
2. The reasons for the proposed debarment; and
3. An opportunity will be afforded to such person or persons for a hearing if the hearing is requested within seven days from the date of personal delivery or the date of mailing of such notice. Such request shall be filed with the Department at the following address:

Office of Legal Affairs
 ATTENTION: Adjudicatory Hearing Requests
 Department of Environmental Protection
 401 East State Street
 PO Box 402
 Trenton, New Jersey 08625-0402

(b) All such hearings shall be conducted in accordance with the provisions of the Administrative Procedure Act (N.J.S.A. 54:14B-1 et seq.). Where any State department or agency has already imposed debarment upon a party, the commissioner may also impose a similar debarment without affording an opportunity for a hearing, provided the commissioner furnishes notice of the proposed similar debarment to that party, and affords that party an opportunity to present information in his behalf to explain why the proposed similar debarment should not be imposed in whole or in part.

(c) Debarment shall be for reasonable, definitely stated period of time which as a general rule shall not exceed five years. Debarment for an additional period shall be permitted provided that notice thereof is furnished and the party is afforded an opportunity to present information in his behalf to explain why the additional period of debarment should not be imposed.

(d) Except as otherwise provided by law, a debarment may be removed or the period thereof may be reduced in the discretion of the commissioner, upon the submission of a good faith application under oath, supported by documentary evidence, setting forth substantial and appropriate grounds for the granting of relief, such as, newly discovered material evidence, reversal of a conviction or judgment, actual change of ownership, management or control, or the elimination of the causes for which the debarment was imposed.

(e) A debarment may include all known affiliates of a person provided that each decision to include an affiliate is made on a case by case basis after giving due regard to all relevant facts and circumstances. The offense, failure or inadequacy of performance of an individual may be imputed to a person with whom he is affiliated, where such conduct was accomplished within the course of his official duty or was effected by him with the knowledge or approval of such person.

Administrative change to (a)3.
See: 23 N.J.R. 3325(b).

7:1D-2.5 Suspension and causes therefor

The commissioner may suspend a person from State contracting with the department or any agency within the control or jurisdiction of the department for any cause specified in section 2 of this subchapter or upon a reasonable suspicion that such cause exists.

7:1D-2.6 Conditions for suspension

(a) Suspension from State contracting shall be made only by the commissioner with the approval of the Attorney General, except as otherwise provided by law.

(b) The existence of any cause for suspension shall not require that a suspension be imposed, and a decision to suspend shall be made at the discretion of the commissioner with the approval of the Attorney General, if in the best interests of the State.

(c) Suspension shall not be based upon unsupported accusation, but upon adequate evidence that cause exists or upon evidence adequate to create a reasonable suspicion that cause exists.

(d) In assessing whether adequate evidence exists, consideration shall be given to the amount of credible evidence which is available, to the existence or absence of corroboration as to important allegations, and to inferences which may properly be drawn from the existence or absence of affirmative facts.

(e) Reasonable suspicion of the existence of a cause described in section 2(a)1 through 7 of this subchapter may be established by the rendering of a final judgment or conviction by a court or administrative agency of competent jurisdiction, by grand jury indictment, or by evidence that such violations of civil or criminal law did in fact occur.

(f) A suspension invoked by another department or agency in the executive branch for any of the causes described in section 2 of this subchapter may be the basis for the imposition of a concurrent suspension by the commissioner without the necessity of an approval therefor by the Attorney General.

7:1D-2.7 Procedures, period and scope of suspension

(a) When the commissioner suspends a person or his affiliates from department contracting, the person or persons suspended shall be furnished with a written notice that within ten days after the effective date of the suspension stating that:

1. A suspension has been imposed and its effective date;
2. The reasons for the suspension to the extent that the Attorney General determines that such reasons may be properly disclosed;
3. The suspension is for a temporary period pending the completion of an investigation and such legal proceedings as may ensue; and
4. If legal proceedings are not commenced or the suspension removed within 60 days of the date of such notice, the party will be given either a statement of the reasons for the suspension and an opportunity for a hearing if he so requests, or a statement declining to give such reasons and setting forth the position of the commissioner regarding the continuation of the suspension;
5. Where a suspension by another department or agency in the executive branch has been the basis for suspension by the commissioner, he shall note that fact as a reason for his suspension.

(b) A suspension shall not continue beyond 18 months from its effective date unless civil or criminal action regarding the alleged violation shall have been initiated within that period, or unless debarment action has been commenced. Whenever prosecution or debarment action has been initiated, the suspension may continue until the legal proceedings are completed.

(c) A suspension may include all known affiliates of a person, provided that each decision to include an affiliate is made on a case by case basis after giving due regard to all relevant facts and circumstances. The offense, failure or inadequacy of performance or an individual may be imputed to a person with whom he is affiliated, where such conduct was accomplished within the course of his official duty or was effectuated by him with the knowledge or approval of such person.

(d) A request for a hearing under (a) above shall be filed with the Department at the following address:

Office of Legal Affairs
 ATTENTION: Adjudicatory Hearing Requests
 Department of Environmental Protection
 401 East State Street
 PO Box 402
 Trenton, New Jersey 08625-0402

Administrative change to (d).
 See: 23 N.J.R. 3325(b).

7:1D-2.8 Applicability

The rules contained herein governing debarment or suspension shall be applicable to existing practices and procedures of the department and all agencies within the control or jurisdiction of the department, under laws that concern prequalification for State contracting to the extent that such practices and procedures may concern the disqualification of any person from State contracting.

7:1D-2.9 Exclusions

Any exclusion from department contracting under these rules by virtue of debarment, suspension or disqualification shall extend to all State contracting and subcontracting within the control or jurisdiction of the department; provided, however, if the commissioner determines that it is essential to the public interest and files a finding thereof with the Attorney General, the commissioner may grant an exception from total exclusion with respect to a particular contract.

7:1D-2.10 Notice

Insofar as practicable, prior notice shall be given by the commissioner to the Attorney General and the Treasurer of any proposed debarment or suspension under these rules.

7:1D-2.11 Lists

The department shall provide the State Treasurer with the names of all persons suspended or debarred and the effective date and term thereof, if any.

7:1D-2.12 Discretion

Nothing required by these rules shall be construed to limit the authority of the commissioner or any agency within the

control or jurisdiction of the department to refrain from contracting within the discretion allowed by law.

APPENDIX A

New Jersey Department of Environmental Protection Mapping the Present to Protect New Jersey's Future MAPPING AND DIGITAL DATA STANDARDS

prepared by:

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May, 1995

Summary

The New Jersey Department of Environmental Protection (DEP) has developed a Geographic Information System (GIS) for use by the DEP for the storage and analysis of cartographic (mapped) and related environmental scientific and regulatory database information. A GIS is a computer mapping system used in the analysis of geographic data and databases. The DEP requires that mapped information be submitted according to the standards of this document such that the data can be input to the DEP/GIS for review and analysis. This document details three important GIS concepts regarding the creation, capture and delivery of mapped information.

First, all basemaps regardless of scale must meet a definable standard, such as United States National Map Accuracy Standard's (NMAS), referenced in this document, or be of survey quality. This will guarantee true positional accuracy of data layers. The NJDEP has produced a series of photobase maps at quad (1:24000) and quarterquad (1:12000) scales which meet NMAS (See Basemap Availability).

Secondly, geographic data shall be mapped in state plane coordinates (SPC). SPC means a geographic reference system in the horizontal plane describing the position of points or features with respect to other points in New Jersey. The official survey base of the state is known as the New Jersey State Plane Coordinate System whose geodetic positions have been adjusted on the North American Datum of 1983 (NAD83) as per Chapter 218, Laws of New Jersey 1989. Although this official survey base is defined in meters, the NJDEP will accept and prefers state plane coordinators in survey feet.

Thirdly, geographic data must be fully documented (Section 6.0 and 9.0) and delivered to the DEP in digital format, as shown in Table 1 of this document. There are several different formats such as a simple space delimited ASCII file of coordinates, a .DXF file from AutoCad, or an

Arc/Info export file, depending on the mapping requirements.

For more information concerning GIS, the user community in New Jersey, data availability, and GPS, the 1995 New Jersey GIS Resource Guide is available from the Bureau of Geographic Information and Analysis (BGIA), PO Box 428, Trenton, NJ (609) 984-2243 for the cost of reproduction (\$20).

Note: Rules, contracts and/or other regulatory documents from the DEP may specify items required such as content, scale, format or media.

MAPPING AND DIGITAL DATA STANDARDS FOR THE NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION GEOGRAPHIC INFORMATION SYSTEM

1.0 INTRODUCTION

Geographic Information System (GIS) technology has become a state-of-the-art tool for innovative efforts nationally to protect the natural environment and public health. The New Jersey Department of Environmental Protection (DEP) acquired GIS software (ARC/INFO) in 1987 to provide technical and analytical support to the DEP's decision-making process. To adequately protect the environment, the NJDEP must make decisions based on sound, accurate spatial data. This document details the basic standards for creating, converting and encoding analog spatial data into a digital form for use on a GIS.

The DEP/GIS is administered by the Bureau of Geographic and Information and Analysis (BGIA). The BGIA is responsible for the day to day operations of the system, training, coordination of data base development, pilot applications, GIS research, and user support. In support of these roles, the BGIA has established a core set of standards for all data development and input for the DEP/GIS. Basic standards will assure consistent data quality and documentation, compatibility between data sets, and facilitate interactive analysis and assure the quality of results derived from the DEP/GIS. For more information concerning GIS, aerial photography, geodetic control, and global positioning (GPS), the 1995 New Jersey GIS Resource Guide, is available from the BGIA, (609) 984-2243.

Geographic data must be delivered to the DEP in digital format, according to Table 1 of this document. This can be as simple as an ASCII file of coordinates, space delimited on 3.5" diskette, to a .DXF file from AutoCad, to an Arc/Info export file, depending on the mapping requirements.

2.0 BASEMAPS

Cartographic (locational) data input into the GIS must be derived from or mapped to georeferenced basemaps that meet or exceed National Map Accuracy Standards (NMAS) or be of survey quality. Recompiling data from sources which are not planimetric to georeferenced basemaps is always required. Basemaps at any scale should always meet NMAS at a minimum (Section 8.0). Data derived from GPS technology must also meet a standard and be documented (Section 7.0).

Over the years the DEP has produced several series of quality basemaps which are GIS compatible. In several cases these maps are synoptic and statewide, such as the photo basemaps associated with the 1991 and 1986 overflights. In other cases the basemaps cover specific areas only, such as the 1977-78 Tidelands photo basemaps which cover coastal tidal New Jersey only. The basemaps described here were produced on stable base mylar, are photo-images, and meet a definable mapping standard. These maps in mylar and paper are acceptable basemaps which should be used whenever possible to generate GIS compatible data and/or to use as a recompilation base. The various Basemap sources are described below.

All the maps described herein with the exception of the 1991/92 products are referenced in NAD27. For this reason, the 1991 Basemap quads (1:24000) and quarterquads (1:12000) series, referenced in NAD83, are highly recommended over all other sources listed for mapping at these scales (See Basemap Availability).

1991 Aerial Photographs and Basemaps

In February and March of 1991 the DEP and the USGS flew a joint high altitude aerial mission over New Jersey producing a set of quarterquad centered color infrared (CIR) photos at 1:40000. These frames are available from the USGS National Earth Science Information Center (703) 648-6045. The frames are available for review at the DEP's Tidelands Element, 9 Ewing Street, Trenton.

The DEP then created a set of hardcopy chronoflex quarterquad (1:12000) and photoquad basemaps (1:24000) (Figure 1) for the public and regulated community to meet the requirements of DEP mandated mapping. This series of maps is referenced in state plane coordinates in NAD83. Mylar copies, the preferred base, are available from the contractor (See Basemap Availability). Paper prints are available from Mapsales. This series of maps represents the best maps available statewide at these two scales for mapping. Soft copy digital images of both quads and quarterquads are also available at both scales (See Basemap Availability).

1986 Freshwater Wetlands Quarterquad Maps (1:12000)

The passage of the Freshwater Wetlands Act of 1987 required the DEP to produce a composite map of the freshwater Wetlands for the state. The Department recommended and subsequently produced a set of 624 chronoflex photo quarterquads for the entire state from the March 1986 overflight. The quarterquads meet NMAS. The maps represent a good source for both photo-interpretation and recompilation at a county, municipal or in many cases, at a site level.

1986 Photoquad Basemaps (1:24000)

The Department sponsored a statewide overflight in March 1986 and produced a complete set of stable base photoquads at 1:24000 (Figure 2). The control for the production of these basemaps was the mylar USGS 7.5-Minute topoquads. The photoquads have been widely used both to create data layers and to recompile other data sources from paper or nonplanimetric sources. Paper prints are available from Mapsales.

1977/78 Tidelands Basemaps (1:2400)

The DEP produced a series of 1:2400 basemaps for the coastal zone including all tidal areas in the state to delineate the State's claim to all tide-flowed lands. The series consists of 1628 photo basemaps. These maps are rectified products which meet NMAS below the ten foot contour. The photo-image is late summer of 1977 and 1978.

USGS 7.5-Minute Series Topoquad Basemaps (1:24000)

The USGS has published an entire series of 172 topographic maps for the state at a scale of 1:24000. The base information ranged from the late 1940's to the 1980's with photo-updates into the 1990's. Because these maps vary in source date, and because the DEP has produced more accurate and current basemaps (1991), the USGS Topoquads series is not recommended as a primary Basemap but may be helpful as a supplemental source of information.

Basemap Availability

Paper prints of 1986 and 1991 photo basemaps may be obtained from NJDEP Mapsales (609) 777-1039, as well as paper prints of most USGS quadrangles. Paper prints from the 1977/78 series are available from the DEP Tidelands Element (609) 292-2573. Other basemaps that meet NMAS may be available from the private sector.

Mylar photo basemaps from 1991, 1986 and 1977/78 and the digital imagery from 1991 may be obtained from the DEP contractor, MARKHURD, Minneapolis, MN (1-800-MAP-HURD).

3.0 MAP COMPILATION

Mapped information comes from a variety of sources which are not always GIS compatible. Consequently, each source must be evaluated to determine whether redrafting is

necessary to prepare the data for entry into the GIS. Much of the data required for the GIS can be derived directly from the photo-interpretation of aerial photos to rectified photo basemaps. Data delineated on unrectified sources or sources of unknown quality may be recompiled to rectified photo basemaps. However, some mapped information may be of such poor quality that recompilation is not possible and the data layer must be recreated.

3.1 Photo-interpretation

Today's GIS data development efforts rely, to a large degree on the derivation of themes from the stereoscopic interpretation of aerial photos. The DEP has used this technique in conjunction with various photo basemaps to produce land use/land cover and freshwater wetland coverages, for instance. The DEP maintains an extensive library of current and historical photos in color infrared, color and panchromatic photographs from the 1930's to the present. The bulk of this photography is held by the Tidelands Management Program (TMP). The TMP, offers light tables, photo basemaps and stereoscopes as well as some instruction on set up to assist the public and regulated community. This service is available at a modest fee and is well worth the effort, particularly if the data are to be captured in the GIS.

When creating new data sets or updating existing ones, delineators should be intimately familiar with the classification coding scheme being employed prior to producing data for input into the GIS. Care should be taken in choosing an appropriate standard classification system. If non-standard classification systems are used, the contractor shall fully describe the system.

3.2 Recompilation

Recompilation involves the redrafting of features from one resource to a more accurate, planimetric source based on identifiable features. This method is commonly used to give more accuracy to data which has been delineated on sources of unknown or unspecified quality or paper manuscripts. It is also commonly used to transfer data delineated on unrectified photography to a rectified basemap based on a series of local fits of common photo-identifiable features, such as roads.

To date, this technique has been employed to redraft the U.S.D.A., Natural Resource Conservation Service (NRCS) soils data from the soil survey atlas sheets (mapped to unrectified photos) to georeferenced (rectified) photoquad or quarterquad basemaps. The technique for accomplishing this is detailed in Photobase Map Compilation (USDA, 1984). This manuscript is an excellent technical guide for recompilation.

Other data sources without photo-images may be recompiled to planimetric sources by using other coincident features. For instance, grids on source data may be generated

and plotted to planimetric basemaps and used as a guide for the redrafting of information which would otherwise not be usable in a digital form. This method has been used to draft historical purveyor boundaries from old atlas sheets to the photoquads, for instance. Whatever the technique, a data dictionary form must be completed for each map layer describing the recompilation techniques employed.

4.0 DATA AUTOMATION

The conversion of analog data to digital data is a critical step in the creation of a digital database in the GIS. Tablet digitizing is the most common method, however, scanning is gaining popularity, particularly when large data development projects are involved. For tablet digitizing manuscript lines should be clear and complete with no gaps or shortfalls. Operators should not interpret and digitize at the same time. The digitizer should concentrate solely on capturing the exact nature of the linework. All maps shall be edge matched prior to digitization to eliminate cartographic errors and reduce digital problems. GPS derived points are captured digitally and do not require automation (Section 7.0).

Heads up digitizing is a new digitizing technique which is useful for capturing data or updates from digital imagery. The BGIA is presently evaluating this technique and will issue related standards in the near future.

Digital accuracy shall be evaluated by proof plotting the digital data to the base at the same scale as the manuscript and overlaying the data to the original map. The linework should be digitized in such a way as to create a digital copy which is within \pm one line width. Through this process edits such as omissions and inaccurate representations can be flagged and corrected such that the standard is met.

The coding of features should follow an approved classification system as adopted by state and federal agencies. These codes follow specifications of organizations responsible for deriving and maintaining the data. For example, the DEP uses the Cowardin et al. (1979) system for the Classification of Wetland and Subaqueous Lands in the United States as adopted by the National Wetlands Inventory of the U.S. Fish and Wildlife Service. In addition the Department supports a modified version of Anderson et al. (1976), USGS, for classifying land use/land cover. For prototype classification schemes, clear concise documentation describing the classes is required.

All attribute coding shall be 100% correctly coded. Code sheets shall also be provided, listing the code and full description of each code. All documentation shall be delivered in hard copy and on diskette. Codes shall also be described in the Data Dictionary (Section 9.0).

5.0 DATA TRANSFER

At a minimum, for the delivery of coordinates and simple database, data shall be submitted in an ASCII flat file format on 3.5' diskette. For instance, data from a word processor can be saved to an ASCII text file for delivery.

For GIS binary map files (coverages) the digital format shall be an export format compatible with the DEP/GIS according to Table 1. The NJDEP GIS is ARC/INFO software running on a UNIX based SUN network with a SUN SPARC 1000 server. For submittal to the Department, please use any of formats in Table 1, listed in order of preference (Arc/Info Export, .DXF, flat ASCII). In the future, the Department will support the new federally adopted spatial data transfer standard (SDTS).

Large cartographic digital data sets shall be delivered on 8mm exabyte tape or 150 mb $\frac{1}{4}$ " tapes in UNIX format using tar or cpio (high or low density, please specify). DOS formatted data can be delivered on QIC120 mb tapes. Small data sets may be delivered on 3 $\frac{1}{2}$ " (1.4 mb format) diskette in the format specified (DOS or UNIX). For diskettes with text or files, the data shall be on a DOS formatted disk, in space delimited format file (SDF, no delimiters). Please send all files uncompressed unless decompression software is supplied.

6.0 DOCUMENTATION

Each digital data layer must be fully documented by the producer following the attached data dictionary format (Section 9.0). Additional associated text files which describe details of the coverage are stored as readme files associated with the Dictionary files for each map.

7.0 GLOBAL POSITIONING SYSTEM

The NAVSTAR Global Positioning System (GPS) has become an accepted and widespread technology for capturing mappable features digitally for use in a GIS, particularly for points (wells, outfalls, etc.) and lines (trails, site boundaries, etc.). The system is based on a constellation of orbiting satellites that enable users with GPS receivers to determine 3D positions anywhere on or near the earth's surface. A GPS receiver must be able to "see" 4 or more GPS satellites in order to determine positions.

The range of accuracy afforded by GPS is \pm 100 meters to sub-centimeter. The accuracy of any coordinates collected with GPS will depend on several factors: receiver type (carrier phase vs. code based), the GPS conditions under which the coordinate data is collected (number of satellites and satellite geometry), whether the quality of the locations are enhanced through differential processing, and the data collection technique (field procedures used) by the GPS receiver operator. GPS accuracies are not expressed in absolute terms. Rather they are expressed as a value such as 5 meters 2dRMS. What this really means is that roughly 95% of the horizontal (x,y) values are within 5 meters of truth.

Receiver Classes and Accuracy Capabilities

The two general classes of GPS receivers provide two very different methods by which GPS signals are processed and therefore accuracy capabilities. Carrier phase receivers use characteristics of the GPS signal (i.e. wavelength) to determine positions, while code based (C/A code) receivers rely on information imbedded in the signal.

Using correct GPS survey techniques and under the right conditions, carrier phase receivers can produce extremely accurate locations (even to a few millimeters 2dRMS). Carrier phase receivers should be used for determining locations that require a high level of accuracy. For a GIS, carrier phase receivers should be used for establishing a very accurate geodetic control network on which very accurate base maps could be generated. GIS feature locations can be determined with carrier phase receivers if the mapping project requires features to be mapped to a very high degree of accuracy (to within 1 meter). Carrier phase GPS operation is more difficult and sometimes impossible in areas that are less GPS friendly. These would include areas with significant obstructions (buildings and tree canopy) that might block or weaken GPS signals.

In most DEP cases, feature mapping for a GIS can be accomplished with data collected with a code based GPS receiver. The DEP recommends that code based GPS receivers for GIS data collection be 6 or more channels (enabling better performance under adverse conditions), and be capable of storing position fix data (allowing post processed differential corrections). All GPS data collected for NJDEP's GIS must be differentially corrected, either in a post process step or in real time. If correct procedures and proper techniques are employed, code based receivers should provide a degree of horizontal accuracy acceptable for most mapping applications (to within 5 meters 2dRMS). Code based receivers cannot be relied upon for accurate elevation data. Elevation values derived by code based GPS receivers may be in error 2 to 4 times the error of the horizontal measurement.

For point features (well locations, sampling stations, pollution sources, etc.) a sample of 200 positions fixes must be collected with PDOP 6. Linear features (trails, shoreline boundaries, etc.) may also be mapped using GPS by storing position fixes while tracing the feature on foot or in vehicle.

Sources of GPS Base Data

There are several sources of GPS base data in New Jersey. This reference data is necessary for differential GPS. For greater accuracy, users should obtain base data from the source nearest the project area.

The DEP/BGIA operates a Trimble Navigation Pathfinder Community Base Station in Trenton. This station stores GPS base data and makes the files available through an electronic bulletin board system (BBS). The phone

number to access the BBS is (609) 633-0511. The logging hours of the receiver are Monday through Friday, 7 am to 7 pm. The BBS is operational seven days a week, 24 hours a day. The base data collected by this station can only be used to differentially correct data from Trimble code based receivers (Pathfinder series). In order for the data to be compatible with other GPS receiver manufacturer's (such as Magellan, or Garmin) file formats, the Trimble file format must be converted to RINEX format. DEP does not provide RINEX base files.

The U.S. Environmental Protection Agency's Region II office located in Edison operates a similar station. The phone number to access the EPA BBS is (908) 321-6663. The logging hours of the station are seven days a week, 7 am to 7 pm. The BBS is operational seven days a week, 24 hours a day.

The National Oceanic and Atmospheric Administration (NOAA) operates a Continuously Operating Reference Station (CORS) at Sandy Hook, as part of a network of stations to support post processing applications. This station provides code range and carrier phase GPS data in the RINEX format. Data can be obtained via the INTERNET (<ftp://proton.ngs.noaa.gov>) and is available for 21 days. This station also broadcasts differential GPS corrections to support real-time positioning and navigation applications. For more information contact the National Geodetic Survey at (301) 731-3208. For more information on GPS refer to the 1995 New Jersey GIS Resource Guide.

8.0 NATIONAL MAP ACCURACY STANDARDS

United States National Map Accuracy Standards

U.S. Bureau of the Budget, Revised June 17, 1947

With a view to the utmost economy and expedition in producing maps which fulfill not only the broad needs for standard or principal maps, but also the reasonable particular needs of individual agencies, standards of accuracy for published maps are defined as follows:

1. **Horizontal accuracy.** For maps on publication scales larger than 1:20,000, not more than 10 percent of the points tested shall be in error by more than 1/30 inch, measured on the publication scale; for maps on publication scales of 1:20,000 or smaller, 1/50 inch. These limits of accuracy shall apply in all cases to positions of well-defined points only. Well-defined points are those that are easily visible or recoverable on the ground, such as the following: monuments or markers, such as bench marks, property boundary monuments; intersections of roads, railroads, etc.; corners of large buildings or structures (or center points of small buildings); etc. In general what is well defined will also be determined by what is plottable on the scale of the map within 1/100 inch. Thus while the intersection of two road or property lines meeting at right angles would come within a sensible interpretation, identification of the intersection of such lines meeting at an acute angle would obviously not be

practicable within 1/100 inch. Similarly, features not identifiable upon the ground within close limits are not to be considered as test points within the limits quoted, even though their positions may be scaled closely upon the map. In this class would come timber lines, soil boundaries, etc.

2. **Vertical accuracy**, as applied to contour maps on all publication scales, shall be such that not more than 10 percent of the elevations tested shall be in error more than one-half the contour interval. In checking elevations taken from the map, the apparent vertical error may be decreased by assuming a horizontal displacement within the permissible horizontal error for a map of that scale.

3. **The accuracy of any map may be tested** by comparing the positions of points whose locations or elevations are shown upon it with corresponding positions as determined by surveys of a higher accuracy. Tests shall be made by the producing agency, which shall also determine which of its maps are to be tested, and the extent of such testing.

4. **Published maps meeting these accuracy requirements** shall note this fact on their legends, as follows: "This map complies with National Map Accuracy Standards."

5. **Published maps whose errors exceed those aforesaid** shall omit from their legends all mention of standard accuracy.

6. **When a published map is a considerable enlargement** of a map drawing (manuscript) or of a published map, that fact shall be stated in the legend. For example, "This map is an enlargement of a 1:20,000-scale map drawing," or "This map is an enlargement of a 1:24,000-scale published map."

7. **To facilitate ready interchange and use of basic information for map construction** among all Federal mapmaking agencies, manuscript maps and published maps, wherever economically feasible and consistent with the uses to which the map is to be put, shall conform to latitude and longitude boundaries, being 15 minutes of latitude and longitude, or 7.5 minutes, or 3 $\frac{3}{4}$ minutes in size.

(from Thompson, 1987)

9.0 DATA DICTIONARY

Example:

DATA DICTIONARY

COVERAGE NAME: atlitum

DATA DESCRIPTION: Integrated Terrain Unit for Atlantic county.

KEYWORDS: landuse, soils, Atlantic, geology, floodprone

CONTACTS

AGENCY: BGIA
 NAME: Larry Thornton/John Tyrawski
 ADDRESS: PO Box 428
 Trenton, NJ 08625-0428
 PHONE: 984-2243

MANUSCRIPT MAP INFORMATION

BASEMAP:	Photo-Quad	COORDINATE SYSTEM:	NJ State Plane
MAP DATE:	1986	DATUM:	NAD27
SCALE:	24000	MAP ACCURACY:	NMAS
PROJECTION:	Polyconic	GEOGRAPHIC AREA:	County
MAP MEDIA:	Mylar	FEATURE TYPE:	Poly

MAPPING METHODOLOGY AND MAPPING SOURCES:

Landuse/landcover interpreted from 1986 JSS CIR (1:58000) photos. Geology recompiled from 1906 (1:63360) Atlas Sheets. Soils recompiled from 1978 SCS Soil Survey. Floodprone areas recompiled from paper USGS flood maps (polys closed by Contractor).

MAPPING CRITERIA:

Landuse/landcover mapped using modified Anderson, et al. (1976) classification system. Minimum mapping unit = 2.5 acres. Other sources rescaled to 1:24000 and recompiled to 1986 photoquads based on coincident features.

MAPPING ACCURACY AND DATA LIMITATIONS:

Basemap (photoquad) feature positions are good to about \pm 20 feet from locations on manuscript. Freshwater wetlands and geology are general, more detail in FWW and Cogeomap coverages.

MAP AUTOMATION

AUTOMATION DATE: April 1994 COORDINATE SYSTEM: NJ State Plane
 DATUM: NAD83

AUTOMATION METHODS:	scan
PRODUCTION STAFF:	ESRI and AIS, Redlands, CA
AUTOMATION STATUS:	complete
DATA AVAILABILITY:	QUIC150, Exabyte in Arc/INFO, EXPORT

CARTOGRAPHIC QUALITY:

Data has not been systematically plotted on mylar and checked to basemap. Nodeerrors, labelerrors and slivers resolved. Code validity checked with FREQUENCY.

DISTRIBUTION RESTRICTIONS:

Requires Data Distribution Agreement.

MAP AUTOMATION

DATABASE: Info

<u>ITEM NAME</u>	<u>DESCRIPTION</u>
LAND USE	-Landuse/landcover code (four digit).
SOIL-LABEL	-SCS Soil label.
PRIM-GEOL	-Primary Geology.

ITEM NAME	DESCRIPTION
SEC-GEOL	-Secondary Geology.
SURFICIAL-GEOL	-Surficial Geology.
FLOODPRONE	-Floodprone areas.
SOIL-INCLUSIONS	-Soil inclusions for polys that had soils polygons of less than 2.5 acres.
SOIL CAPS	-SCS soil labels in capitals for reselects.

LOOKUP AND/OR RELATED DATA FILES:

Lookup tables for landuse/landcover, soils, geology and floodprone areas. Associated readme files (rdm) describe landuse/landcover.

ATTRIBUTE QUALITY:

Frequencies run to check for valid attributes. Field checks were made for all accessible xxx9 polys. Landuse codes containing xxx9 are polygons which require field check.

LOOKUP TABLE DESCRIPTIONS:

ATLBDRK.LUT	Bedrock geology (primary, secondary).
ATLSOILS.LUT	Soils (consult Soil Survey).
ATLFLOOD.LUT	Floodprone areas.
ATLSOILINC.LUT	Soil inclusions.
ATLLU.LUT	Landuse/landcover.
ATLSURF.LUT	Surficial geology.

10.0 REFERENCES

Anderson, J.R., et al., 1979, *A Land Use and Land Cover Classification System for Use with Remote Sensor Data*, U.S.

Department of Interior, Geologic Survey Professional Paper 964. 288pp.

Cowardin, L.M., et al., 1976, *Classification of Wetland and Deepwater Habitats of the United States*, U.S. Department of Interior, U.S. Fish and Wildlife Service, FWS/OBS-77/1. 103pp.

Thompson, M.M., *Maps for America*, 1987, 3rd Edition, U.S. Department of the Interior, U.S. Geological Survey, 265pp.

U.S. Department of Agriculture, Soil Conservation Service, 1984, *Photobase Map Compilation, Technical Specifications*, National Instruction No. 170-301. 30pp.

TABLE 1. NJDEP COMPATIBLE CONFIGURATIONS

PLATFORM	SUN SPARC STATION	PC
OPERATING SYSTEM	UNIX	DOS
FORMAT	ARC/INFO >*IMPORT >*EXPORT DXF	FLAT ASCII (SDF) ARC/INFO >*IMPORT >*EXPORT DXF
SOFTWARE	TAR CPIO	VARIOUS
MEDIA	150 MB TAPE 3½" HD 1.44MB CD-ROM EXABYTE (2.3/5GB)	5¼" (1.2MB) 3½" MB 120/250MB QIC120 *COLORADO *MAYNARD

1991 PHOTOQUAD INDEX

TO 7.5 MINUTE (1:24000) SERIES DEP BASEMAPS

- 1 Millford PA-NJ
- 2 Port Jervis Souyh NJ-NYPA
- 3 Unionville NY-NJ
- 4 Pine Island NY-NJ
- 5 Lake Maskenzha PA-NJ
- 6 Culvers Gap NJ-PA
- 7 Branchville NJ
- 8 Hamburg NJ
- 9 Wawayanda NJ-NY
- 10 Greenwood Lake NY-NJ
- 11 Sloatsburg NY-NJ
- 12 Bushkill PA-NJ
- 13 Flatbrookville NJ-PA
- 14 Newton West NJ
- 15 Newton East NJ
- 16 Franklin NJ
- 17 Newfoundland NJ
- 18 Wanaque NJ
- 19 Ramsay NJ-NY
- 20 Park Ridge NJ-NY
- 21 Nyack NY-NJ
- 22 Stroudsburg PA-NJ
- 23 Portland NJ-PA
- 24 Blaiirstown NJ
- 25 Tranquility NJ
- 26 Stanhope NJ
- 27 Dover NJ
- 28 Boonton NJ
- 29 Pompton Plains NJ
- 30 Paterson NJ
- 31 Hackensack NJ
- 32 Yonkers NJ-NY
- 33 Bangor PA-NJ
- 34 Belviders NJ-PA
- 35 Washington NJ
- 36 Hackettstown NJ
- 37 Chester NJ
- 38 Mendham NJ
- 39 Morristown NJ
- 40 Caldwell NJ
- 41 Orange, NJ
- 42 Weehawken NJ-NY
- 43 Central Park NY-NJ
- 44 Easton NJ-PA
- 45 Bloomsbury NJ
- 46 High Bridge NJ
- 47 Califon NJ
- 48 Gladstone NJ
- 49 Bernardsville NJ
- 50 Chatham NJ
- 51 Roselle NJ
- 52 Elizabeth NJ-NY
- 53 Jersey City NJ-NY
- 55 Riegelsville PA-NJ
- 56 Frenchtown NJ-PA
- 57 Pittstown NJ
- 58 Flemington NJ
- 59 Raritan NJ
- 60 Bound Brook NJ
- 61 Plainfield NJ
- 62 Perth Amboy NJ-NY
- 63 Arthur Kill NY-NJ
- 66 Lumberville PA-NJ
- 67 Stockton NJ-PA
- 68 Hopewell NJ
- 69 Rocky Hill NJ
- 70 Monmouth Junction NJ
- 71 New Brunswick NJ
- 72 South Amboy NJ-NY
- 73 Keyport NJ-NY
- 74 Sandy Hook NJ-NY
- 76 Lambertville PA-NJ
- 77 Pennington NJ-PA
- 78 Princeton NJ
- 79 Hightstown NJ
- 80 Jamesburg NJ
- 81 Freehold NJ
- 82 Marlboro NJ
- 83 Long Beach NJ
- 86 Trenton West PA-NJ
- 87 Trenton East NJ-PA
- 88 Allentown NJ
- 89 Roosevelt NJ
- 90 Adelphia NJ
- 91 Farmingdale NJ
- 92 Asbury Park NJ
- 93 Frankford PA-NJ
- 94 Beverly PA-NJ
- 95 Bristol PA-NJ
- 96 Columbus NJ
- 97 New Egypt NJ
- 98 Cassville NJ
- 99 Lakehurst NJ
- 100 Lakewood NJ
- 101 Point Pleasant NJ
- 102 Philadelphia PA-NJ
- 103 Camden NJ-PA
- 104 Moorestown NJ
- 105 Mount Holly NJ
- 106 Pemberton NJ
- 107 Browns Mills NJ
- 108 Whiting NJ
- 109 Keswick Grove NJ
- 110 Toms River NJ
- 111 Seaside Park NJ
- 112 Marcus Hook PA-NJ-DEL
- 113 Bridgeport NJ-PA
- 114 Woodbury NJ
- 115 Runnemede NJ
- 116 Clementon NJ
- 117 Medford Lakes NJ
- 118 Indian Mills NJ
- 119 Chatsworth NJ
- 120 Woodmansie NJ
- 121 Brookville NJ
- 122 Forked River NJ
- 123 Barnegat Light NJ
- 124 Wilmington South DEL-NJ
- 125 Penns Grove NJ-DEL
- 126 Woodstown NJ
- 127 Pitman West NJ
- 128 Pitman East NJ
- 129 Williamstown NJ
- 130 Hammonton NJ
- 131 Atsion NJ
- 132 Jenkins NJ
- 133 Oswego Lake NJ
- 134 West Creek NJ
- 135 Ship Bottom NJ
- 136 Long Beach NE NJ
- 137 Delaware City DEL-NJ
- 138 Salem NJ
- 139 Alloway NJ
- 140 Elmer NJ
- 141 Newfield NJ
- 142 Buena NJ
- 143 Newtonville NJ
- 144 Egg Harbor City NJ
- 145 Green Brook NJ
- 146 New Gretna NJ
- 147 Tuckerton NJ
- 148 Beach Haven NJ
- 149 Taylors Bridge DEL-NJ
- 150 Carton NJ-DEL
- 151 Shiloh NJ
- 152 Bridgeton NJ
- 153 Millville NJ
- 154 Five Points NJ
- 155 Dorothy NJ
- 156 Mays Landing NJ
- 157 Pleasantville NJ
- 158 Oceanville NJ
- 159 Brigantine Inlet NJ
- 160 Bombay Hook DEL-NJ
- 161 Ben Davis Point NJ-DEL
- 162 Cedarville NJ
- 163 Dividing Creek NJ
- 164 Port Elizabeth NJ
- 165 Tuckahoe NJ
- 166 Marmora NJ
- 167 Ocean City NJ
- 168 Atlantic City NJ
- 169 Fortescue NJ
- 170 Port Norris NJ
- 171 Hesterville NJ
- 172 Woodbine NJ
- 173 Sea Isle City NJ
- 174 Rio Grande NJ
- 175 Stone Harbor NJ
- 177 Cape May NJ
- 178 Wildwood NJ
- 974 Sandy Hook East
- 983 Long Branch East
- 982 Asbury Park East
- 9173 Sea Isle City East

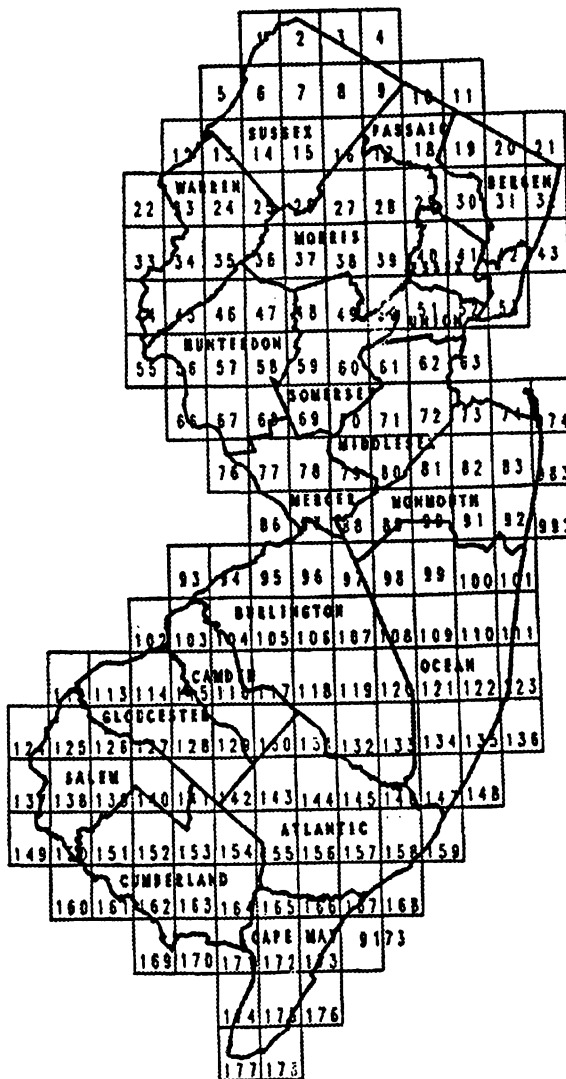


Figure 1

1986 TOPOQUAD AND PHOTOQUAD INDEX

TO 7.5 MINUTE (1:24000) SERIES USGS & DEP BASEMAPS

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- 172 Woodbine NJ
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- 175 Stone Harbor NJ
- 177 Cape May NJ
- 178 Wildwood NJ

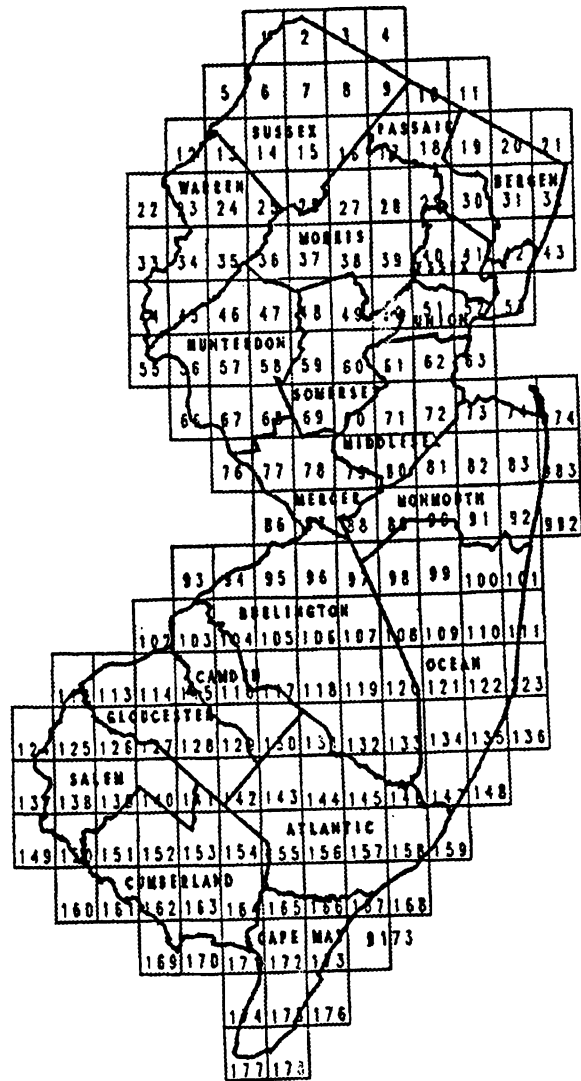


Figure 2

New Rule, R.1996 d.252, effective June 3, 1996.
 See: 27 N.J.R. 2337(a), 27 N.J.R. 2882(a), 28 N.J.R. 2858(a).
 Recodified from 7:1E Appendix C by R.1996 d.462, effective October 7, 1996.

See: 28 N.J.R. 2730(a), 28 N.J.R. 4424(a).