

SOFTWARE RELEASE NOTICE

1. SRN Number: 230		
2. Project Title: Yucca Mountain Repository Program		Project No. 20-01402-461 # 471
3. SRN Title: ArcView, Version 3.1		
4. Originator/Requestor: Deborah Waiting		Date: September 7, 2000
5. Summary of Actions <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Release of new software <input type="checkbox"/> Release of modified software: <ul style="list-style-type: none"> <input type="checkbox"/> Enhancements made <input type="checkbox"/> Corrections made <input type="checkbox"/> Change of access software <input type="checkbox"/> Software Retirement 		
6. Persons Authorized Access		
Name	Read Only/Read-Write	Addition/Change/Delete
Brittain Hill	RO	A/C/D
Darrell Sims	RO	A/C/D
David Farrell	RO	A/C/D
IMS staff	RO	A/C/D
CNWRA Staff	RO	none
7. Element Manager Approval: <i>A. L. McKoy</i>		Date: 11/7/00
8. Remarks: Commercial code purchased from the Environmental Systems Research Institute		

SOFTWARE SUMMARY FORM

01. Summary Date: September 7, 2000		02. Summary prepared by (Name and phone) Deborah Waiting (210-522-5502)		03. Summary Action: NEW	
04. Software Date: July 20, 1998		05. Short Title: ArcView 3.1			
06. Software Title: ArcView GIS Version 3.1				07. Internal Software ID: None	
08. Software Type: <input type="checkbox"/> Automated Data System <input checked="" type="checkbox"/> Computer Program <input type="checkbox"/> Subroutine/Module		09. Processing Mode: <input checked="" type="checkbox"/> Interactive <input type="checkbox"/> Batch <input type="checkbox"/> Combination		10. Application Area a. General: <input checked="" type="checkbox"/> Scientific/Engineering <input type="checkbox"/> Auxiliary Analyses <input type="checkbox"/> Total System PA <input type="checkbox"/> Subsystem PA <input type="checkbox"/> Other b. Specific: Geographic Information System	
11. Submitting Organization and Address: CNWRA/SwRI 6220 Culebra Road San Antonio, TX 78228			12. Technical Contact(s) and Phone: Brittain Hill (210) 522-6087 Darrell Sims (210) 522-6829		
13. Software Application: Program used as a geographical information system to display and query geospatial data sets.					
14. Computer Platform Pentium or higher Intel based microprocessor PC		15. Computer Operating System: MS Windows NT 4.0 or higher		16. Programming Language(s): None (executable only)	
17. Number of Source Program Statements: n/a		18. Computer Memory Requirements: 32 Mb		19. Tape Drives: N/A	
20. Disk Units: N/A		21. Graphics: VGA			
22. Other Operational Requirements At least 17 Mb swap space					
23. Software Availability: <input checked="" type="checkbox"/> Available <input type="checkbox"/> Limited <input type="checkbox"/> In-House ONLY			24. Documentation Availability: <input checked="" type="checkbox"/> Available <input type="checkbox"/> Preliminary <input type="checkbox"/> In-House ONLY		
25. Commercial code developed by the Environmental Systems Research Institute Software Developer: <u>Deborah Waiting</u> Date: <u>9/25/00</u>					



MEMORANDUM



To: Bruce Mabrito

From: Deborah Waiting

Subject: TOP-18 Installation and Configuration Control of ArcView software

September 25, 2000

This memo documents methods used to demonstrate compliance with TOP-18 requirements for acceptance testing (TOP-18, 5.6), configuration control (TOP-18, 5.7), and design verification and release (TOP-18, 5.8–5.9) for commercial software not to be modified by CNWRA staff.

The ArcView software is a program developed by Environmental Systems Research Institute (ESRI) as a geographical information system (GIS). ArcView is a standard GIS program that is used by many government, industrial, and research agencies to create, display, query and analyze geographic data. Data sets are maintained in discrete data files, attributes can be assigned geographic coordinates that reference common spatial coordinate systems. Data attributes can be displayed directly or appended using attributes from other data coverages.

ArcView consists of an executive program (arcview). Add-on programs called extensions provide specialized GIS functionality. Appendix A is a list of extensions that can be installed and then deleted from each ArcView Project as desired by the user. The CNWRA version of ArcView (3.1) is personal computer specific, installed by IMS staff.

After opening ArcView, the user may select the desired extensions from a drop-down menu in the File Menu as shown in Figure 1. A View window is the basis for ArcView Projects. A Project contains at least one View and additional Views can be added or deleted as necessary by the user. The View can be assigned properties by the user, which may be seen in the View Properties drop-down window (Figure 2). To evaluate functionality of ArcView, I opened a copy of an ArcInfo created data coverage from the USGS containing contour locations for a detailed map of the Yucca Mountain region (cf20cont) (Figure 3 and Figure 4).

Functionality of ArcView was tested by opening a Digital Raster Graphic of the Crater Flat, Nevada 7.5' Quadrangle Map. The map is scanned and registered to a coordinate system and was purchased from the USGS on a CD-ROM. Figure 5 confirms that the elevation contours from the two themes overlay correctly with no significant discrepancies. As a verification of the coordinate system, the View was opened in a printing view, called a Layout. A coordinate grid was added to the layout utilizing the Graticules and Measured Grids Extension. The tic marks align with the UTM grid of the scanned map as shown in Figure 6.

**CENTER FOR NUCLEAR WASTE REGULATORY ANALYSES
DESIGN VERIFICATION REPORT FOR CNWRA SOFTWARE**

ACQUIRED CODE - NOT TO BE MODIFIED¹

Software Title/Name: ArcView
Version: 3.1
Demonstration workstation: Shadow NT
Operating System: ms windows NT
Developer: Deborah Waiting

1. Output: TOP-018, Section 5.5.4

Software designed so that individual runs are uniquely identified by Date, Time, Name of software and version?

Yes: ☐ No: ☒ N/A: ☐

Date and time of run: _____
Name and version: ArcView 3.1 Displayed on menu.
Notes: Acquired code that is not to be modified is accepted as is. ✓

2. Medium and Header Documentation: TOP-018, Section 5.5.6

The physical labeling of software medium (tapes, disks, etc.) contain required information?

Yes: ☒ No: ☐ N/A: ☐

Program Name: ArcView GIS
Module/Name/Title: ArcView GIS
Module Revision: 3.1
File Type (ASCII, OBJ, EXE): Installation CD
Recording Date: Nov. 03, 2000
Operating System of Supporting Hardware: MS Windows NT 4.0

Notes: Acquired code that is not to be modified may not have all above elements.

¹ See TOP-018. Table 1 for criteria.

**DESIGN VERIFICATION REPORT FOR CNWRA SOFTWARE
ACQUIRED CODE - NOT TO BE MODIFIED**

3. User's Manual: TOP-018, Section 5.5.5

a) Is there a Users' Manual for the software?

Yes: ☒ No: ☐ N/A: ☐

User's Manual Version and Date: ArcView GIS - 1996

Notes: Help on-line

b) Are there basic instructions for the use of the software?

Yes: ☒ No: ☐ N/A: ☐

Location of Instruction: ArcView GIS - 1996

Notes: Help on-line

4. Acceptance Testing: TOP-018, Section 5.6

a) Has installation testing been conducted for each intended computer platform and operating system?

Yes: ☒ No: ☐ N/A: ☐

Platform(s): Pentium Intel based PC

Operating System(s): NT

Location of Test Results: Deborah waiting memorandum dated 9/25/00

Notes:

5. Configuration Control: TOP-018, Section 5.7

a) Is the Software Summary Form completed and signed?

Yes: ☒ No: ☐ N/A: ☐

Software Summary Form Approval Date: 9/25/00

Notes:

b) Is a software technical description prepared, documenting the essential mathematical and numerical basis?

Yes: ☐ No: ☒ N/A: ☐

Location Technical Description: Extent of technical

Notes: Description in software documentation

c) Is the source code available (or, is the executable code available in the case of (acquired/commercial codes)?

Yes: ☒ No: ☐ N/A: ☐

Location of Source Code: Installation CD located

Notes: in a4 folder

**DESIGN VERIFICATION REPORT FOR CNWRA SOFTWARE
ACQUIRED CODE - NOT TO BE MODIFIED**

6. Configuration Control, continued: TOP-018, Section 5.7

Have all the script/make files and executable files been submitted to the Software Custodian?

Yes: ☒ No: ☐ N/A: ☐

Location of Script/Make Files: _____

Notes: _____

*Script files on
Installation CD. Developer
has not done scripting.*

7. Software Release: TOP-018, Section 5.9

Upon acceptance of the software as verified above, has a Software release Notice, Form TOP-6 been issued?

Yes: ☒ No: ☐ N/A: ☐

Version number on software (~~1.0 for 1st issue~~): _____

Version number on SRN: _____

Notes: _____

3.1

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8. Software Validation: TOP-018, Section 5.10

- a) Has a Software Validation Test Plan (SVTP) been prepared for the range of application of the software?

Yes: ☐ No: ☒ N/A: ☐

Version/Date of SVTP: _____

Date reviewed and approved via QAP-002: _____

Notes: _____

- b) Has a Software Validation Test Report (SVTR) been prepared that documents the results of the validation cases, interpretation of the results, and determination if the software has been validated?

Yes: ☐ No: ☒ N/A: ☐

Version/Date of SVTR: _____

Date reviewed and approved via QAP-002: _____

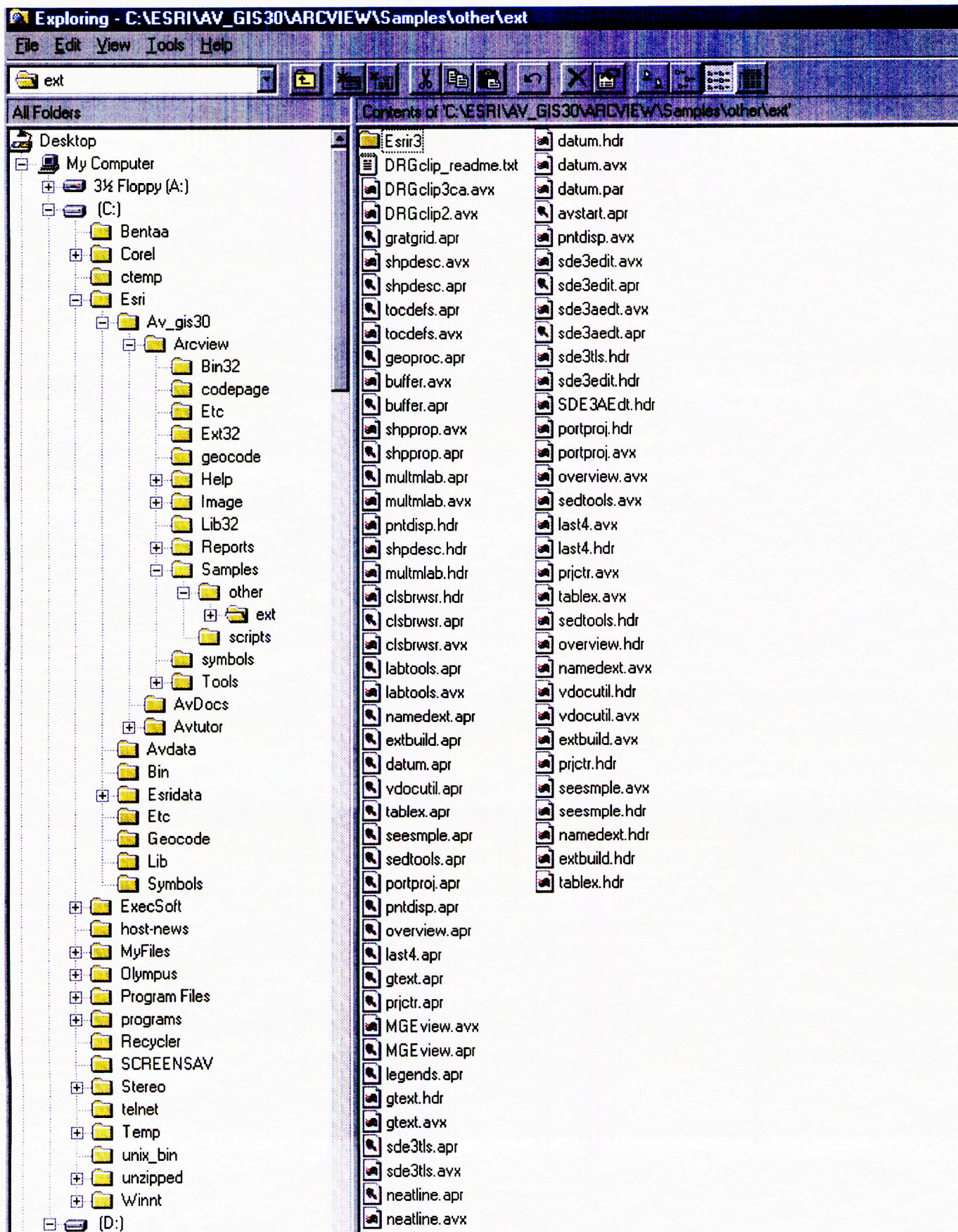
Notes: _____

Additional Remarks: _____

Olivera W. [Signature]
CNWRA Software Developer/Date

11/3/00

[Signature] 11/3/00
CNWRA Software Custodian/Date



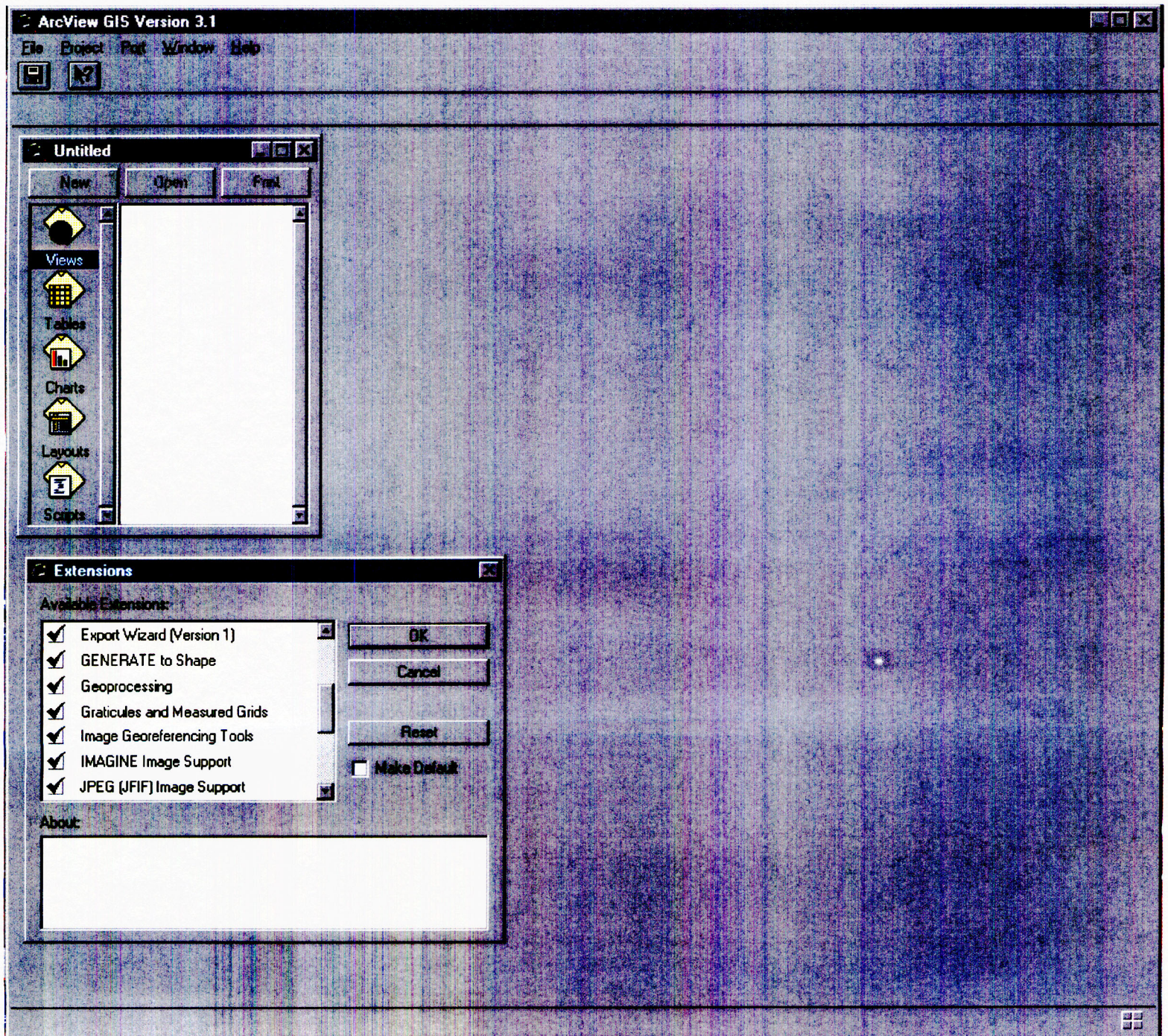


Figure 1

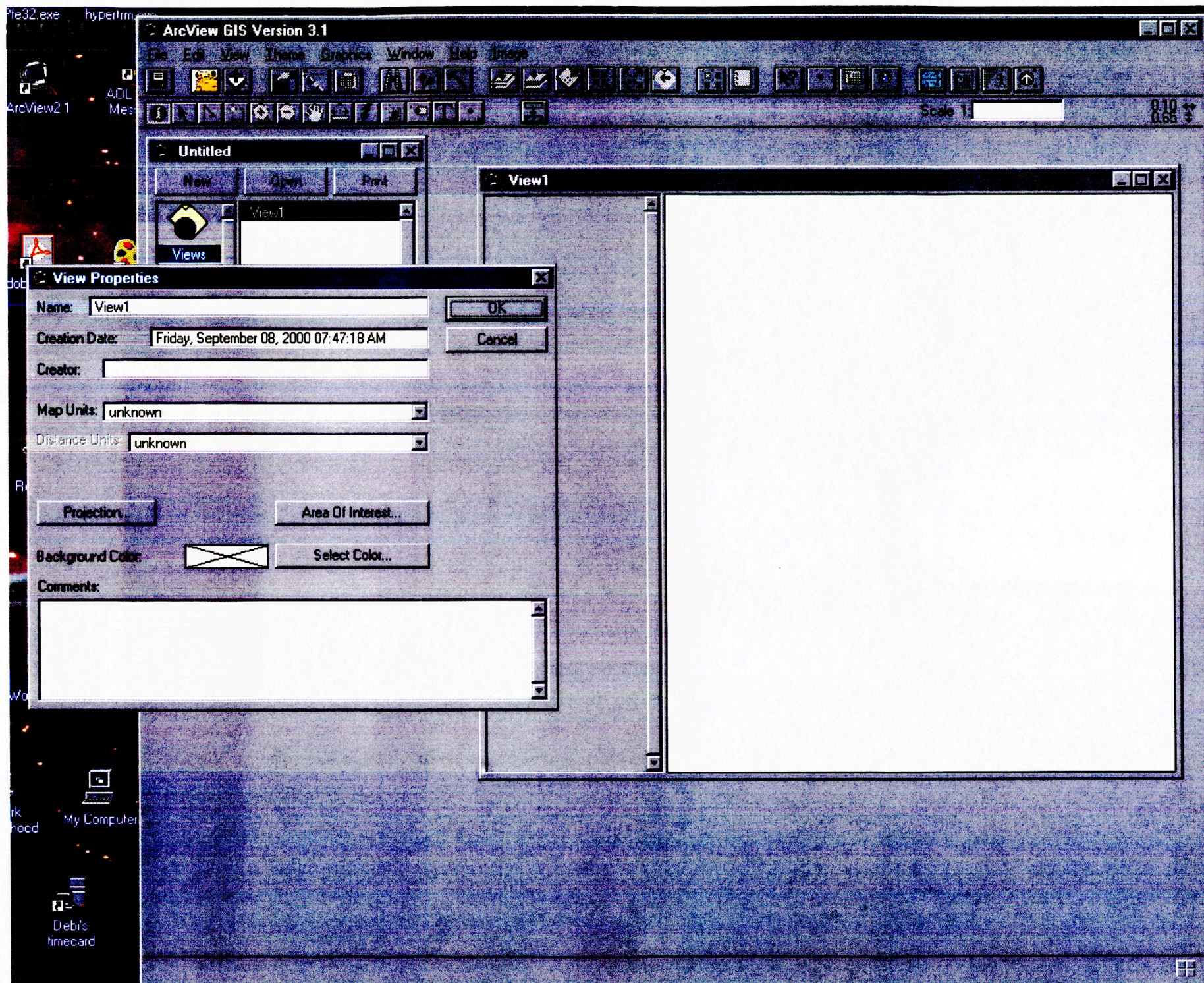


Figure 2

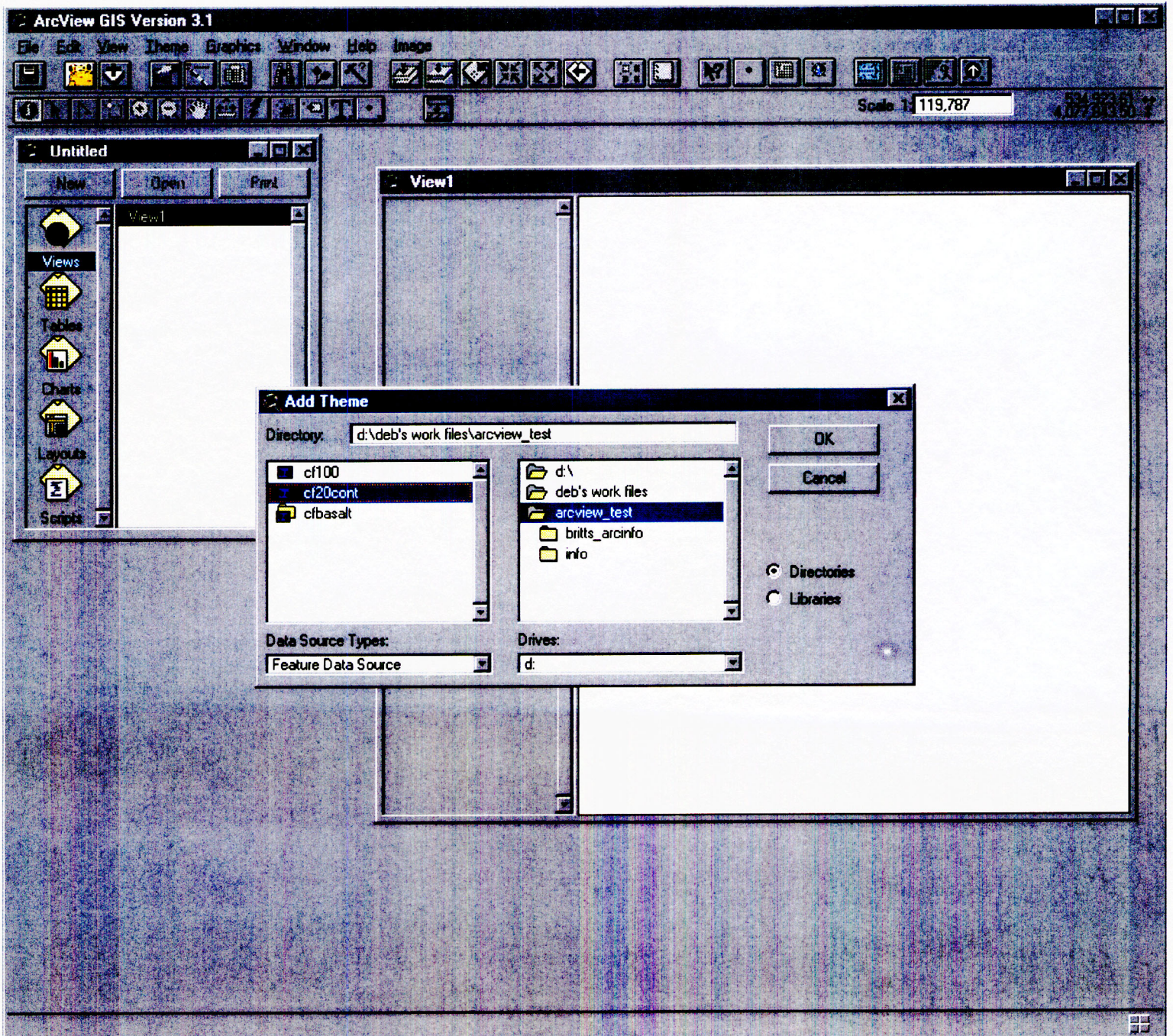


Figure 3

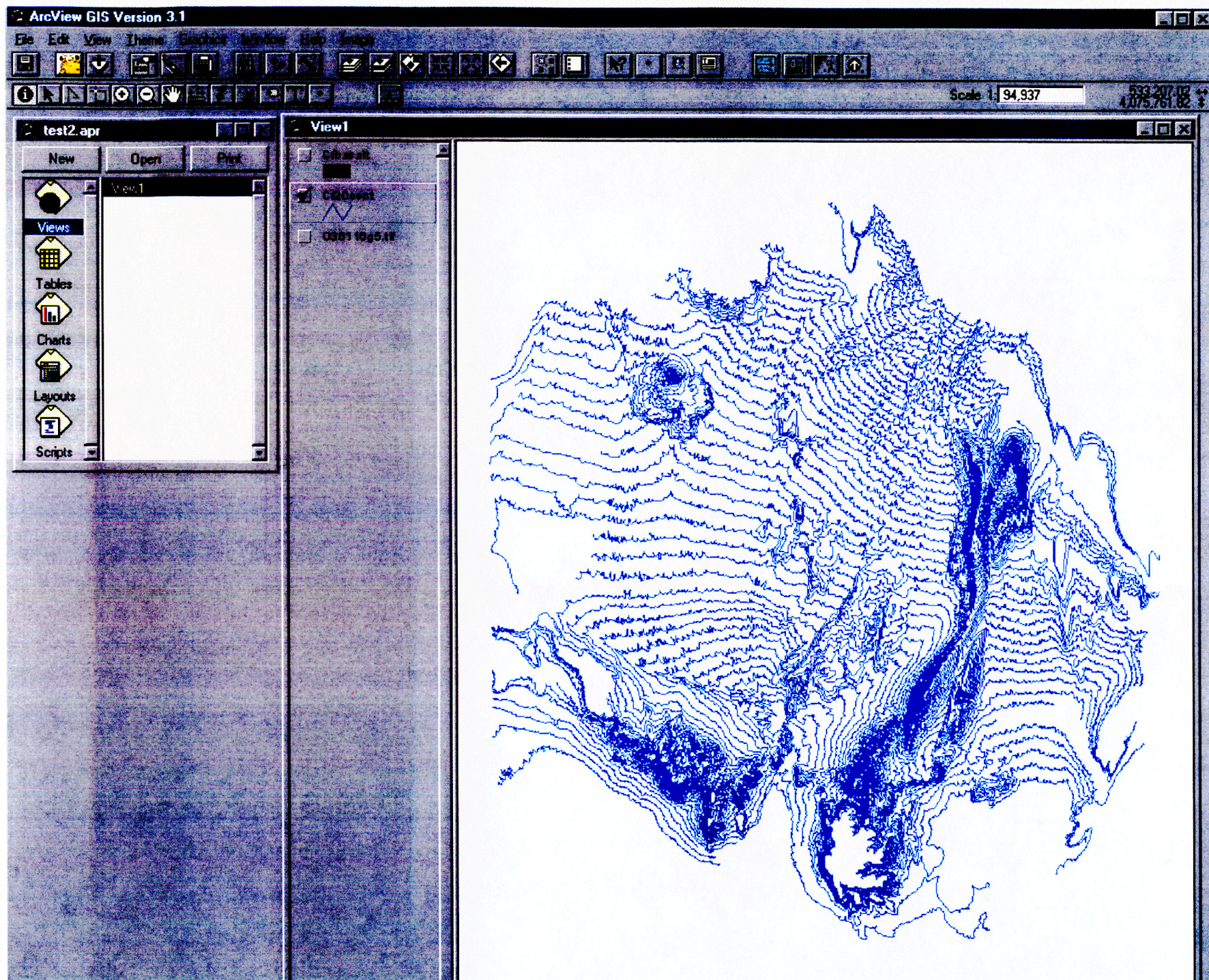


Figure 4

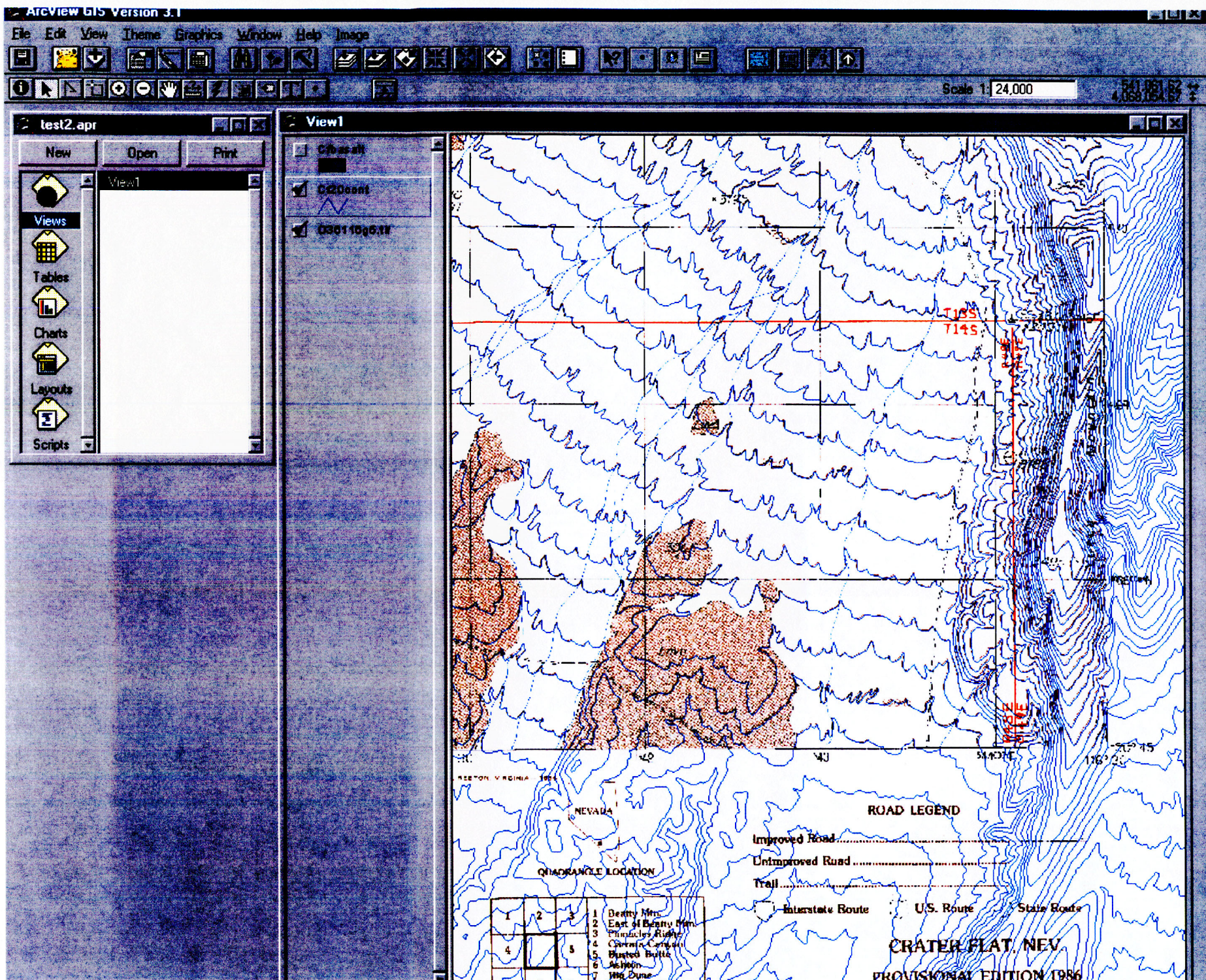


Figure 5

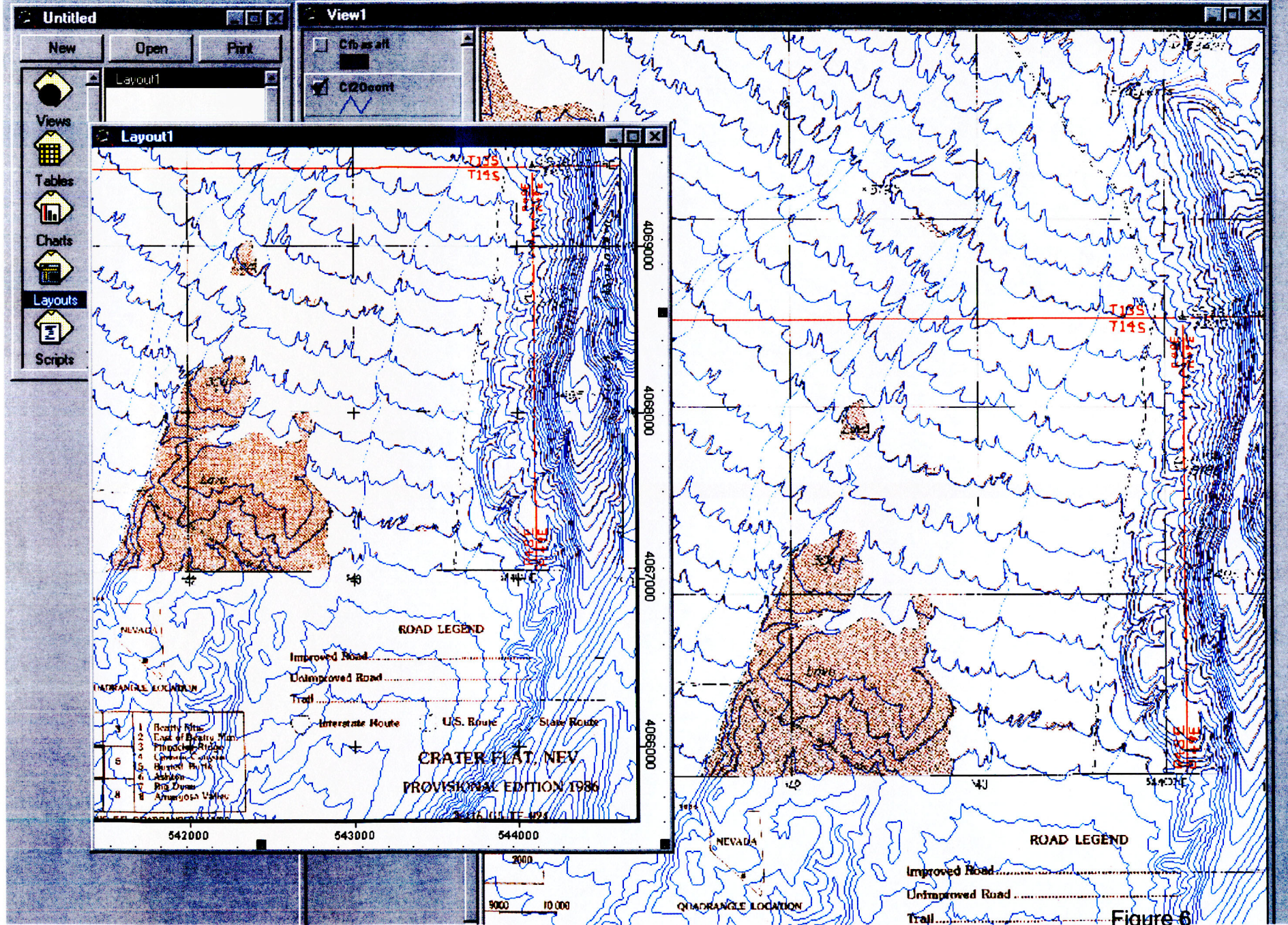


Figure 6

SOFTWARE VALIDATION TEST PLAN FOR ARCVIEW, VERSION 3.1

Prepared for

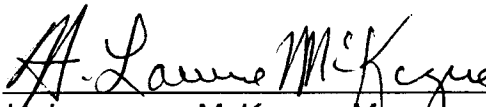
**U.S. Nuclear Regulatory Commission
Contract NRC-02-97-009**

Prepared by

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09/23/02
Date

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1 SCOPE OF THE VALIDATION

This document establishes the Software Validation Test Plan for validating the functionality of the code ArcView, Version 3.1, through comparisons of digitally created data with known mapping data available in the literature. ArcView, Version 3.1, is a standard geographical information system (GIS) program that is used by many government, industrial and research agencies to create, display, query and analyze geographic data. Data sets are maintained in discrete data files; attributes can be assigned geographic coordinates that reference common spatial coordinate systems.

2 REFERENCES

Environmental Systems Research Institute, Inc. "Using ArcView GIS."
Redlands, California. 1996.

3 ENVIRONMENT

3.1 Software

ArcView, Version 3.1, is commercial software developed by Environmental Systems Research Institute (ERSI). Version 3.1 runs in Windows NT 4.0 operating system. The following software items are required to perform the testing activities:

- (i) ArcView, Version 3.1 software
- (ii) Windows NT 4.0 operating system

3.2 Hardware Requirements

ArcView, Version 3.1, runs on a Pentium or higher Intel-based microprocessor PC. The program requires a minimum of 32Mb of computer memory and at least 17Mb of swap space. Input information is in existing raster file format and ArcView shape files. Output information is saved on the computer hard drive. No peripherals (e.g. tape drives, printers, plotters) are necessary to perform testing activities.

4 PREREQUISITES

Running ArcView, Version 3.1, requires installation of the commercially available software, per the developers' User's Manual.

5 ASSUMPTIONS AND CONSTRAINTS

The user of ArcView, Version 3.1, is assumed to be familiar with GIS and geospatial data sets.

6 TEST CASES

The test cases described in this section involve comparisons of maps provided by the United States Geological Survey (USGS) to electronic data coverage provided by the USGS.

6.1 Test Case 1 – Verifying Contour Locations

The contour locations for a detailed vector coverage map from the USGS will be compared with a digital raster graphic 7.5-foot quadrangle map purchased from the USGS on a CD-ROM.

6.1.1 Test Input

The USGS-produced digital line graph (DLG) vector coverage is of the Crater Flat 7.5-foot quadrangle detailed 20-foot contour locations (file: cf20cont). The USGS digital raster graphic is of the Crater Flat, Nevada, 7.5-foot quadrangle map (file: O36116g5.tif).

6.1.2 Test Procedure

After opening ArcView, the user can open a copy of the USGS created vector data coverage containing 20-foot interval contour lines for a detailed map of Crater Flat (file: cf20cont). The user then opens a digital raster graphic of the Crater Flat, Nevada, 7.5-foot quadrangle map. The USGS control map is overlain by the contour coverage.

6.1.3 Test Results

Once the two coverages overlay, elevation contour lines can be compared. No visually apparent discrepancies in the contours should be noted.

6.2 Test Case 2 – Verifying Coordinate System

The coordinate system of a detailed map created from ArcView will be compared with a digital raster graphic 7.5-foot quadrangle map purchased from the USGS on CD-ROM.

6.2.1 Test Input

The USGS-produced DLG vector coverage is of the Crater Flat 7.5-foot quadrangle detailed 20-foot contour lines (file: cf20cont). The USGS digital raster graphic is of the Crater Flat, Nevada, 7.5-foot quadrangle map (file: O36116g5.tif).

6.2.2 Test Procedure

After opening ArcView, the user can open a copy of the USGS vector coverage of 20-foot interval elevation contours of Crater Flat (file: cf20cont) and the USGS digital raster graphic map (file: O36116g5.tif) for the same 7.5-foot quadrangle. In ArcView, the View window is opened in a printing view, called a Layout. A coordinate grid, selected in the same coordinate system as the raster and vector coverages, is added to the layout utilizing the Graticules and Measured Grids extension.

6.2.3 Test Results

The coordinate grid tic marks on the USGS vector coverage map should be compared to the USGS digital raster map's UTM grid. No visually apparent discrepancies in the coordinate grids should be noted.