

Appendix B Digital PSU Verification Procedures for FY2000

This document provides instructions to ICCS's on software and procedures required for PSU verification on digital imagery. These procedures complement what would be done with analog photography and hard copy maps, and are only one of many possible ways to accomplish the task.

Software Required for Viewing Digital Files

Three software packages were evaluated for their ability to do PSU verification on digital imagery. Procedures for each software follow.

- ERDAS Imagine version 8.4.
- ERDAS MapSheets Express version 1.2. This is a free image viewer available for download from <http://www.erdas.com>
- ArcView version 3.2

Other GIS software, like Arc/Info, can do similar tasks, but these three were the only ones evaluated for this document. If an ICCS plans on using other software or procedures, these must be documented and approved by to RISB before beginning.

Data Required for PSU Verification:

- The GeoTIFF image over the PSU provided by the vendor.
- The GeoTIFF DRG over the PSU provided by NCGC.
- The PSU and Point Site Map provided by NCGC as a JPEG file.
- The PSU spatial data base provided by NCGC. Both the polygon and point coverages are required. For ERDAS Imagine and ArcView, this coverage should be in ArcInfo format. ERDAS MapSheets, however, require these files to be in shapefile format.

Verification Process Using ERDAS IMAGINE 8.4 (NT Platform):

Step 1—Start ERDAS IMAGINE. Viewer #1 will be opened automatically. Open a second viewer by clicking on the viewer button icon on the main menu tool bar. Next select **Sessions | Tile viewers** on the main menu tool bar. This separates and redisplay the viewers. The digital image will be displayed in viewer #1 and the JPEG PSU and Point Site Map in viewer #2.

Step 2—From the Viewer #1 tool bar, select the Open Layer icon. This brings up the Layer to Add window and do the following:

- Change the File Type to TIFF (*.tif)
- Move to the directory (if you saved the image to your hard disk) where your digital images are located via the Look In display. Otherwise, the location will be the CD-ROM.
- Select the proper file (when done the OK button will be activated)

Step 3—Select the Raster Options file tab and do the following:

- If needed, change the Layer Display to: Red = 1; Green = 2; Blue = 3. All software does not handle band order the same way. If the colors on the image look peculiar, the red and blue probably need to be switched.
- Be sure Fit to Frame is selected.
- Select OK on the Layer to add window.

The digital image of the PSU should now be displayed in Viewer #1.

Step 4—From the Viewer #2 tool bar, select the Open Layer icon. Once the Layer to add window is open do the following:

- Check the File Type is JFIF (*.jpg).
- Move to the directory (if you saved the image to your hard disk) where your digital image files are located via the Look In display. Otherwise, the location will be the CD-ROM.
- Select the proper image file (when done the OK button will be activated)
- Select the Raster Options file tab and do the following:
 - If needed, change the Layer Display to: Red = 1; Green = 2; Blue = 3.
 - Be sure Fit to Frame is selected.
 - Select OK on the Layer to add window.

The DRG PSU and Point Site Map should now be displayed in Viewer #2.

Step 5—To add the polygon and point ArcInfo coverages to Viewer #1 (fig. 1) do the following:

- **File | Open | Vector**
- Move to the directory where your ArcInfo coverages are located via the Look In display.
- Select the polygon coverage (when done the OK button will be activated)
- **Vector | Viewing Properties** (PSU boundaries and labels)
 - Click off the arc check box
 - Click on the polygon check box
 - Click on the color box to the right of the all button
 - Click on other
 - Click off solid color
 - Click on use outline
 - Click apply
 - Click OK
 - Click on the attribute check box
 - Select Poly-ID as the attribute
 - Click apply
 - To avoid doing these steps for every PSU save the symbology using the save button
- **File | Open | Vector**
- Move to the directory where your ArcInfo coverages are located via the Look In display.
- Select the point coverage (when done the OK button will be activated)
- **Vector | Viewing Properties** (PSU points and labels)
 - Click on the attribute check box
 - Select **Point-ID** as the attribute
 - Click **apply**
 - To avoid doing these steps for every PSU save the symbology using the **Save** button

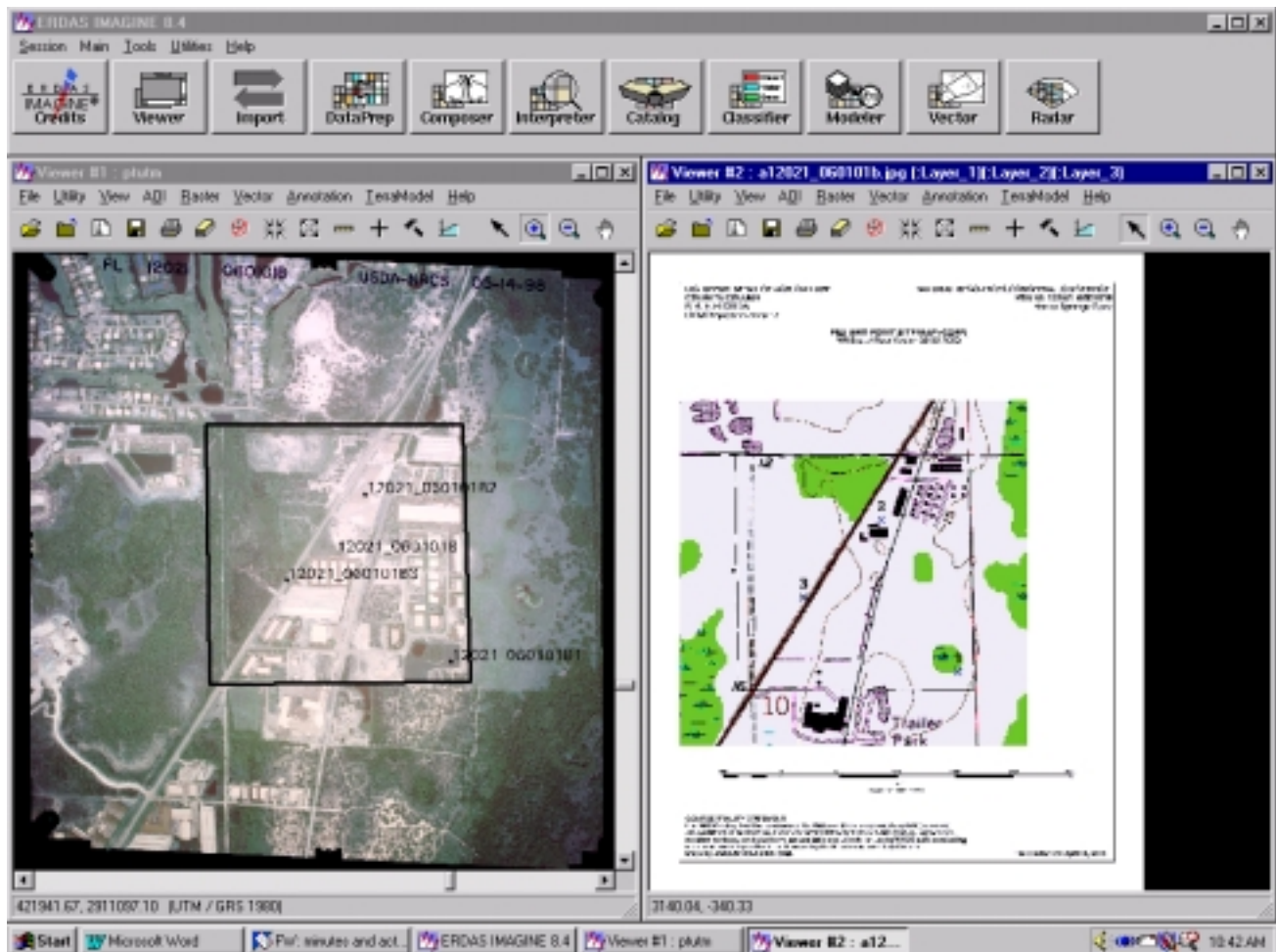


Figure 1 ERDAS Imagine screen shot

Step 6—Compare the two viewers looking for discrepancies in location of the boundaries, points, and labels. Zoom in on the views as needed to check locations. If any discrepancies are found, follow the chapter 4 instructions for reporting changes.

Step 7—Open a Viewer #3 and select the **Open Layer** icon. Once the layer to add window is open do the following:

- Check the File Type is TIFF (*.tif).
- Move to the directory (if you saved the image to your hard disk) where Geotiff DRG is located via the Look In display. Otherwise, the location will be the CD-ROM.
- Select the proper image file (when done the **OK** button will be activated)
- Select the **Raster Options** file tab and do the following:
 - If needed, change the Layer Display to: Red = 1; Green = 2; Blue = 3.
 - Be sure Fit to Frame is selected.

Step 8—Select **OK** on the Layer to add window.

Step 9—Follow step 5 to add the boundary and points. Compare Viewer #3 to the other viewers looking for discrepancies. Viewers #1 and #3 can be linked if desired because they both contain georeferenced data.

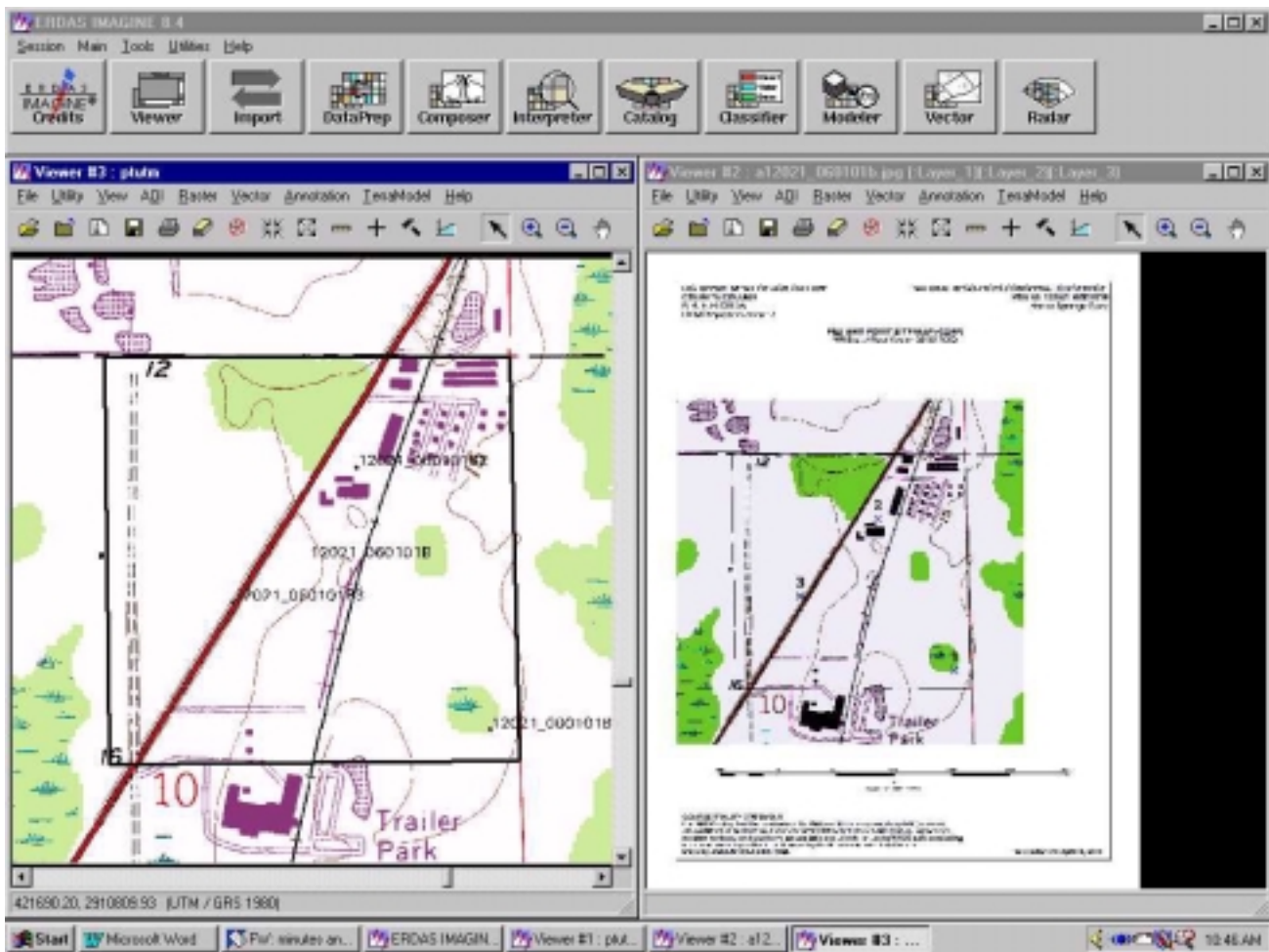


Figure 2 ERDAS Imagine screen shot

Verification Process Using ERDAS MapSheets Express 1.2

Step 1—Select **File | New | Viewer**. This will open Viewer 1.

Step 2—Select **File | Open**. In the **Open in** dialog box, use the popup list to select Viewer 1. Change directories to the location of the digital camera image, select the file and click on **Open**. The digital camera image is now displayed in this viewer. Then click on **View | Fit to Frame**.

Step 3—Select **File | Open**. In the **Open in** dialog box, use the pop-up list to select Viewer 1. Change directories to the location of the ArcView shapefile of the PSU polygons, select the file and click on **Open**. The PSU boundary is now displayed over the digital camera image. The PSU boundary will probably be displayed with a solid fill.

- To change it to an outline, double click on the fill. A **Legend Category** box will be displayed.
- Select **Poly-ID** as the category for legend. Click **OK**.
- An **Object Properties** box will open. In the **Visual Format** section, click on the **Click box to modify** entry.
- Change the Fill to **none**.
- Click **Apply**.
- Click **OK**.

Step 4—Select **Layer | Popup labels**. Click **on**. Click **select category** as the Poly-ID. When the cursor is moved over the PSU, the label will pop up on the screen.

Step 5—Select **File | Open**. In the **Open in** dialog box, use the pop-up list to select Viewer 1. Change directories to the location of the ArcView shape of the PSU points, select the file and click on **Open**. The PSU points are now displayed over the digital camera image.

Step 6—Select **Layer | Popup labels**. Click **on**. Click **select category** as the Point-ID. When the cursor is moved over the PSU points, their label will pop up on the screen.

Step 7—Select **File | New | Viewer**. This will open Viewer 2.

Step 8—Resize Viewer 1 and Viewer 2 until they each cover a third of the screen.

Step 9—Select **File | Open**. In the **Open in** dialog box, use the pop-up list to select **Viewer 2**. Change directories to the location of the jpeg PSU and Point Site Map, select the file and click **Open**. The PSU and Point Site Map should now be displayed in this viewer. Then click on **View | Fit to Frame**.

Step 10—Select **File | New | Viewer**. This will open Viewer 3. Resize the viewer to the same size as the others.

Step 11—Select **File | Open**. In the **Open in** dialog box, use the pop-up list to select **Viewer 3**. Change directories to the location of the GeoTIFF DRG, select the file and click on **Open**. The DRG is now displayed in this viewer. Then click on **View | Fit to Frame**.

Step 12—Select **File | Open**. In the **Open in** dialog box, use the pop-up list to select **Viewer 3**. Change directories to the location of the ArcView shape of the PSU polygons, select the file and click on **Open**. The PSU boundary is now displayed over the DRG. Use the procedure in step 3 to change the fill to none.

Step 13—Select **Layer | Popup labels**. Click **On**. Click **Select category** as the **Poly-ID**. When the cursor is moved over the PSU, the label will pop up on the screen.

Step 14—Select **File | Open**. In the **Open in** dialog box, use the pop-up list to select **Viewer 3**. Change directories to the location of the ArcView shape of the PSU points, select the file and click on **Open**. The PSU points are now displayed over the DRG.

Step 15—Select **Layer | Popup labels**. Click **On**. Click **Select category** as the **Point-ID**. When the cursor is moved over the PSU points, their label will pop up on the screen.

Step 16—Compare all three viewers looking for discrepancies in location of the boundaries, points, and labels. Zoom in on the views as needed to check locations. If any discrepancies are found, follow the chapter 4 instructions for reporting changes.

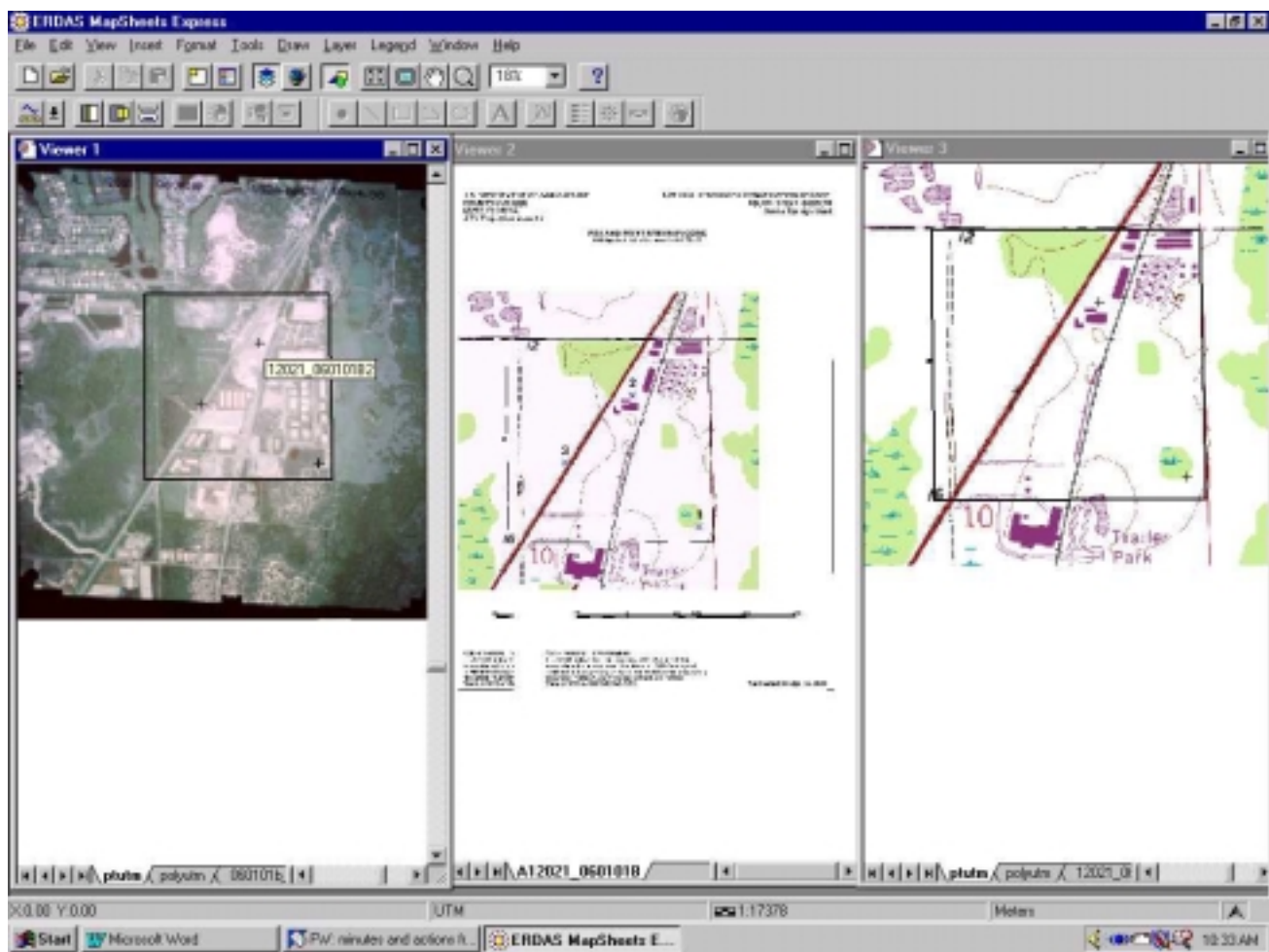


Figure 3 ERDAS MapSheets screen shot

Verification Process Using ArcView 3.1 or 3.2 NT

Step 1—Open a blank View1 window

Step 2—Click on **View | Add Theme**

Step 3—On the **Data Source Types** pop-up list, make sure that **Image Data Source** is selected. Change directories to the location of the digital camera image, select the file and click **OK**. Then check the box in the view's **Table of Contents** to turn on the theme. The full view of the image should be displayed.

Step 4—Open a blank View2 window. Before you attempt to display an image in this view, click on **File | Extensions** and make sure the JPEG (JFIF) Image Support extension is turned on.

Step 5—Adjust View1 and View2 so that each covers half the screen.

Step 6—In View2, click on **View | Add Theme**. Change directories to the location of the PSU and Point Site Map, select the file and click **OK**. Then check the box in View2's **Table of Contents** to turn on the theme.

Step 7—Return to View1. Click on **View | Add Theme**. On the **Data Source Types** pop-up list, change the type to **Feature Data Source**. Change directories to the location of the ArcInfo PSU polygon coverage. Select the directory, then select the polygon coverage (not label points) and click **OK**. Then check the box in the view's **Table of Contents** to turn on the theme. Double click on the polygon theme name to display the **Legend Editor**. Double click on the symbol to edit it. Change the outline from a solid color to an outline. Click **Apply** and close the Legend Editor. The PSU boundary should now be displayed as an outline on the digital image.

Step 8—To display the PSU points in View1, click on **View | Add Theme**. On the **Data Source Types** pop-up list, make sure the type is set to **Feature Data Source**. Change directories to the location of the ArcInfo PSU point coverage, select it and click **OK**. Then check the box in the view's **Table of Contents** to turn on the theme. The PSU points should now be displayed on the digital image. If you want to change the size, shape, or color of the points, use the Legend Editor.

Step 9—To check the labels for the boundaries or points, in the view's Table of Contents, click the name of the theme that has the feature you need to identify. This makes the theme active. When a theme is active, it appears highlighted (raised up) in the Table of Contents. Click the **Identify tool**. Click on the feature you need to identify. The feature you click on flashes in the view, and its attributes appear in the **Identify Results** dialog. Alternatively, you could also use the **Label tool** or the **Theme | Auto label** to check the labels. See the ArcView manual for details on using these functions.

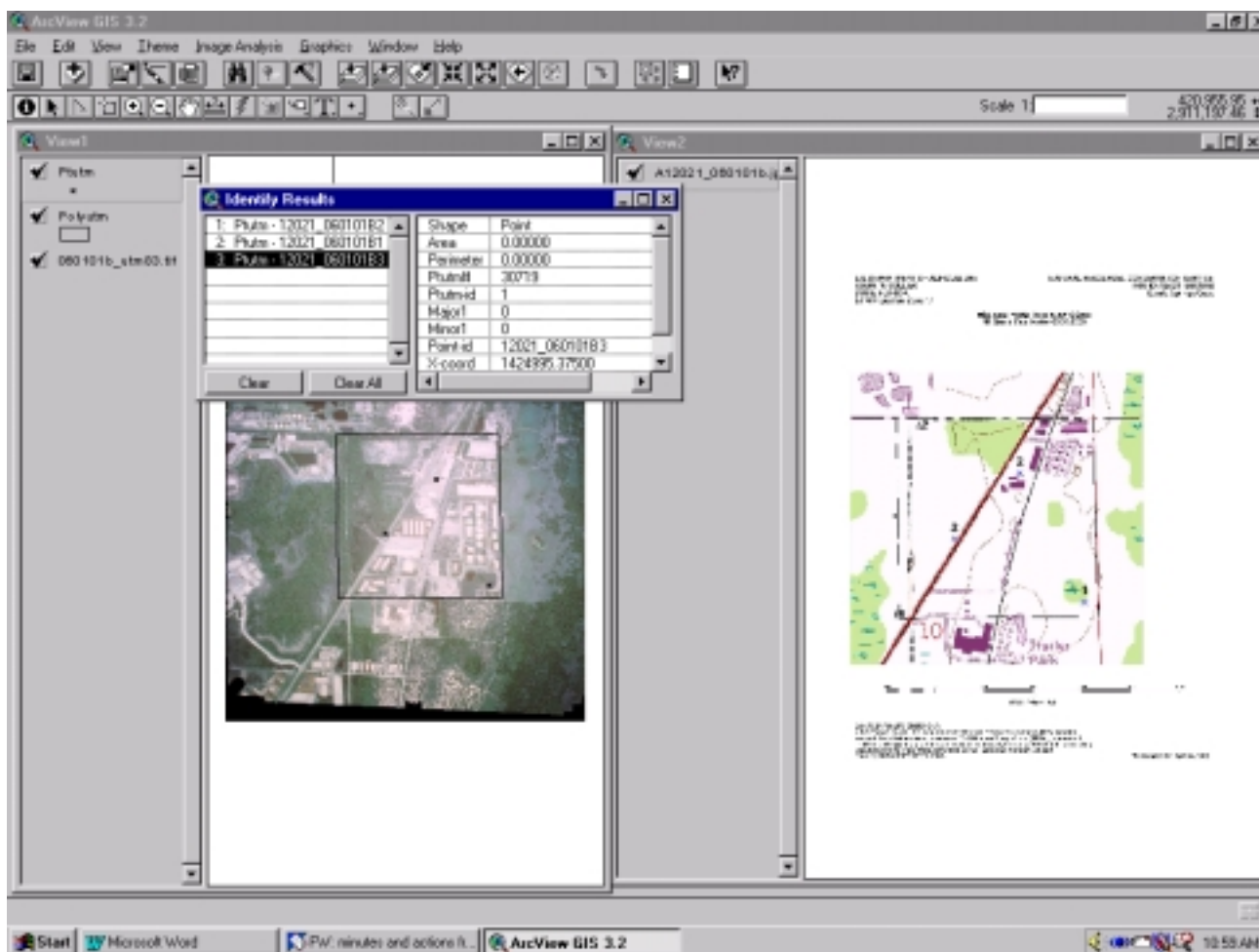


Figure 4 ArcView screen shot

Step 10—To verify the boundary and points on the DRG, open a blank View3 window.

Step 11—Click on **View | Add Theme**

Step 12—On the **Data Source Types** pop-up list, make sure that **Image Data Source** is selected. Change directories to the location of the DRG, select the file and click **OK**. Then check the box in the view's **Table of Contents** to turn on the theme. The full view of the image should be displayed. To display the PSU boundary and points in View3, use the same procedure detailed in steps 8 and 9.

Step 13—Compare all three views looking for discrepancies in location of the boundaries, points, and labels. Zoom in on the views as needed to check locations. If any discrepancies are found, follow the Chapter 4 instructions for reporting changes.

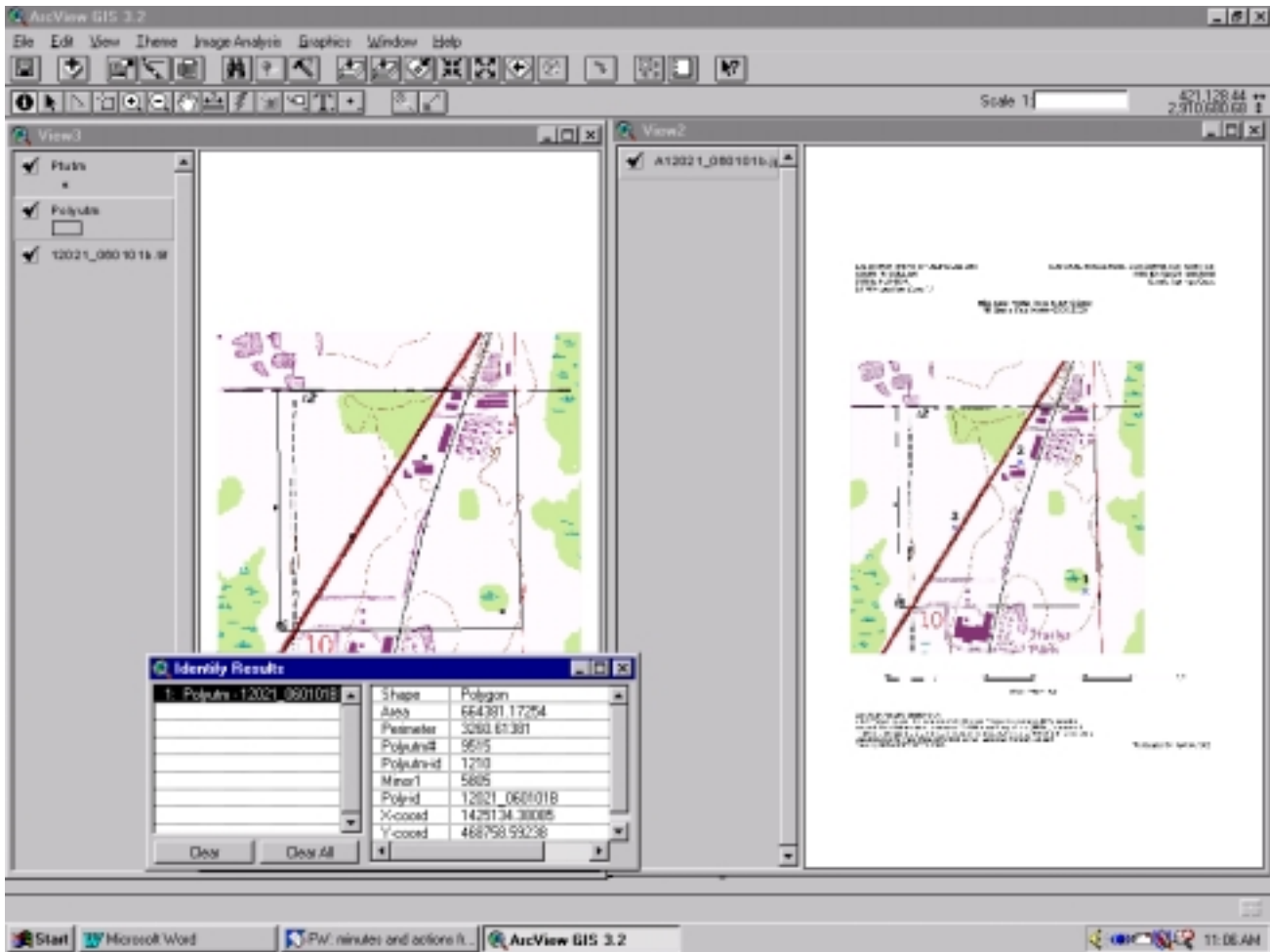


Figure 5 ArcView screen shot

Verification Process Using ARC/INFO or Other Software

(Note: to be developed. Waiting on input from ICCS.)