GIS Parcel Viewer
Web Mapping Application
Functional Documentation

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Juniata County, Pennsylvania

Presented by

WorldView SOLUTIONS

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1. Overview

This document provides the locality with details on the setup and workflow of the GIS Parcel Viewer application, including core functionality, additional functionality requested by the locality, and details on application requirements and specifications.

The Parcel Viewer interface has been designed to provide users with a simple and intuitive web mapping experience that is modeled after popular consumer based web mapping applications. This includes extensive searching capabilities with detailed results, a buttonless interface, seamless panning, scroll-wheel zooming and intuitive search and mark-up tools. The web mapping application is designed to work with all modern web browsers but is optimized for Internet Explorer 8+ and Firefox 3.5+.

2. Core Application Functionality

The Parcel Viewer application guides users through a tabbed interface for searching, displaying and viewing data, and hyperlinked resources. There are four main tabs available in the application: Search Criteria, Search Results, Property Sheet, and Map. After clicking the checkbox to accept the disclaimer, the application will open with the Search tab. With this tab active, searches can be run based on parcels or other added information, which will return a list of matching results from which you can then access detailed information about a selected property. The Search Results tab will remain inactive until a search is run, and the Property Sheet tab will remain inactive until a search result is chosen.

Users also have the option to click on the Map tab without running a search. This can be useful for users who simply want to view the map and the many available layers or for those who already know the specific location of a property.

Key features and functionality of the Parcel Viewer application include:

- **Browser Compatibility** — The interface provides browser support for Internet Explorer 8+, Mozilla Firefox, Apple Safari and Google Chrome. The Javascript API requires no plug-ins such as Silverlight or Flash and the application will also support use via browsers on iOS and Android mobile platforms.
- **ArcGIS Server Configuration** – Nearly every aspect of the user experience will be driven by the ArcGIS map services being consumed by the application. For instance, bookmarks created in ArcMap are automatically available in the application, printing uses the layout properties in the map document, and searches are driven by attribute aliases and field properties set in ArcMap. This includes, but is not limited, to the following application settings made directly from the published ArcMap document:
    - Table of contents display, including symbology, labels, rendering, and scale dependencies for each map layer
    - Spatial bookmarks – driven by those displayed in the map document
    - Search options – determined by selectable layers in map
    - Identify fields, and order of fields – set up in map document
    - Identify and search results field aliases – set up in map document
    - Identifiable layers - determined by selectable layers in map
    - PDF exports - ArcMap layout properties converted directly to these exports
- **Auto-updating TOC and Map Display** — When an available layer is turned off (unchecked), the symbol is concealed in the table of contents. Similarly, when a layer is not viewable in the map as the result of display scale settings, it is grayed out in the TOC. All layer display changes are

rendered immediately on the map; no “redraw” or “refresh” button is required. Layers can also be modeled in the TOC such that certain layers can only be displayed one at a time, by grouping these layers replacing check boxes with toggle buttons.

- **Search Tools** — Data searches are organized into a logical workflow. The search is executed through a text based search form, where users may locate parcels via parcel identifier, address, owner’s name, values, and any other desired attributes. Searches can also be performed on additional data layers such as address points or streets. Search results are listed in the Results tab. Once a record is selected the user can be taken directly to the feature on the map or to the Details tab.
- **Multimedia Links** — Use of hyperlinked photos and digital documents is supported via direct links, preview panes, and/or detail frames.
- **Quick Feature Identification** — By clicking on map locations, users can quickly query information about features on the map. At the locality’s discretion, the results can be displayed in the TOC area, as a balloon caption on the map, or both. Additionally, the locality can control which database fields are displayed to the public.
- **Cartographic Information** — The mapping interface includes a scale bar, live cursor lat/long position indicator, and collapsible map overview inset panel.
- **Map Tools** – A number of map tools are available at the top of the map tab for common user requested capabilities. These include advanced identification of map layers, temporary graphic markup of the map, and other specialized tools such as measuring distance and swiping between various layers.
- **Location Bookmarks** — The locality can specify geographic bookmarks for inclusion in the application. These will allow users to jump to areas of interest around the locality, such as neighborhoods, towns, districts, or points of interest.
- **Help System** — In addition to a highly intuitive, user friendly “button-less” navigation interface, the application contains in-line tool help, as well as an extensive online help system.
- **Map Navigation** — The web mapping user interface includes a map “event” model that is intuitive for any user familiar with consumer web mapping sites. This model allows users to navigate on the map using only the mouse while traditional GIS tasks can be achieved using shortcut and “hot” keys. Map panel interactions occur using the following mouse actions to explore and query the map:

    - **Left Mouse**: Click on the left mouse button and drag the map to the new location. Also, single-click on the visible map feature you want to identify.

    - **Right Mouse**: Click on the right mouse button and select "Print/Export Current Map View" or Insert Pushpin.

    - **Mouse Wheel**: Scroll the mouse wheel forward to zoom in and backward to zoom out. Each wheel click will zoom the map by about 50 percent in width and height.

- **Shift + Left Mouse**: Hold the Shift key down, then hold the left mouse button down and drag on the map to draw a rectangle. The map will zoom in to the area of the rectangle.

- **Double-Click**: Double-click on the mouse to zoom in or out by about 50 percent in width and height.

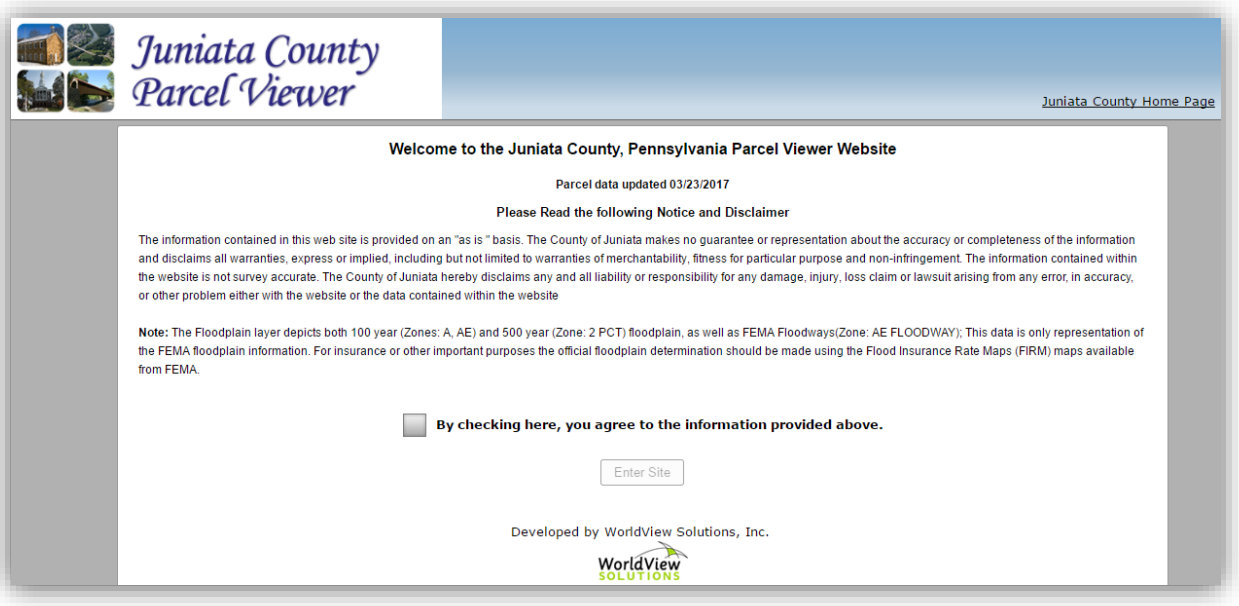
- **Zoom Bar**: Drag pointer up or click or symbols.

3. Parcel Viewer Search Workflow

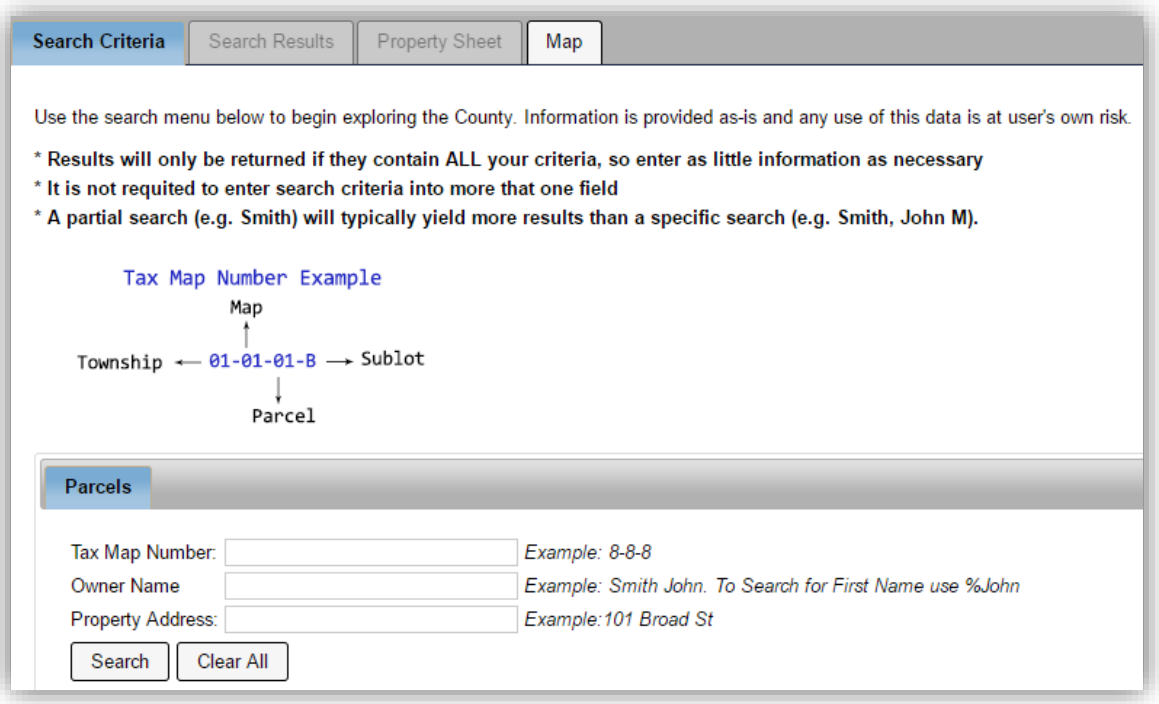
WorldView's Parcel Viewer Search functionality is a configurable tabbed design, allowing users to quickly navigate the data discovery workflow via a single web page. A tab for each part of the query process – Search | Results | Details | Map – will be the main Parcel Viewer navigation interface. All Search and Query capabilities will be template and map service driven, allowing the locality to easily change the way data is queried, based on evolving data requirements or variations in data display preferences.

Search Tabs and Progression

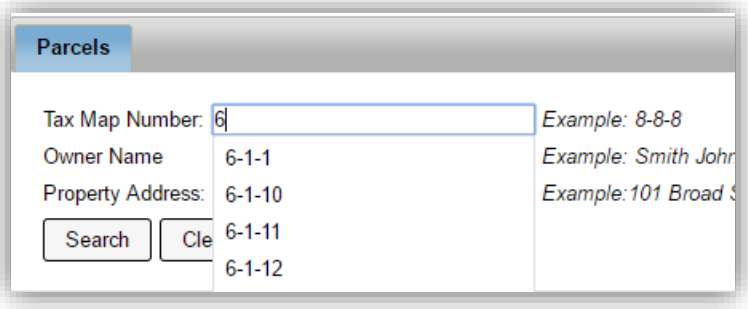
- **Home screen** – Upon visiting the Parcel Viewer URL, users will be welcomed with a home page displaying disclaimer language, proprietary information, and any other customizable data requested by the locality, such as data currency and other page links. Users will need to check the box to agree to the provided information in order to enter the site.



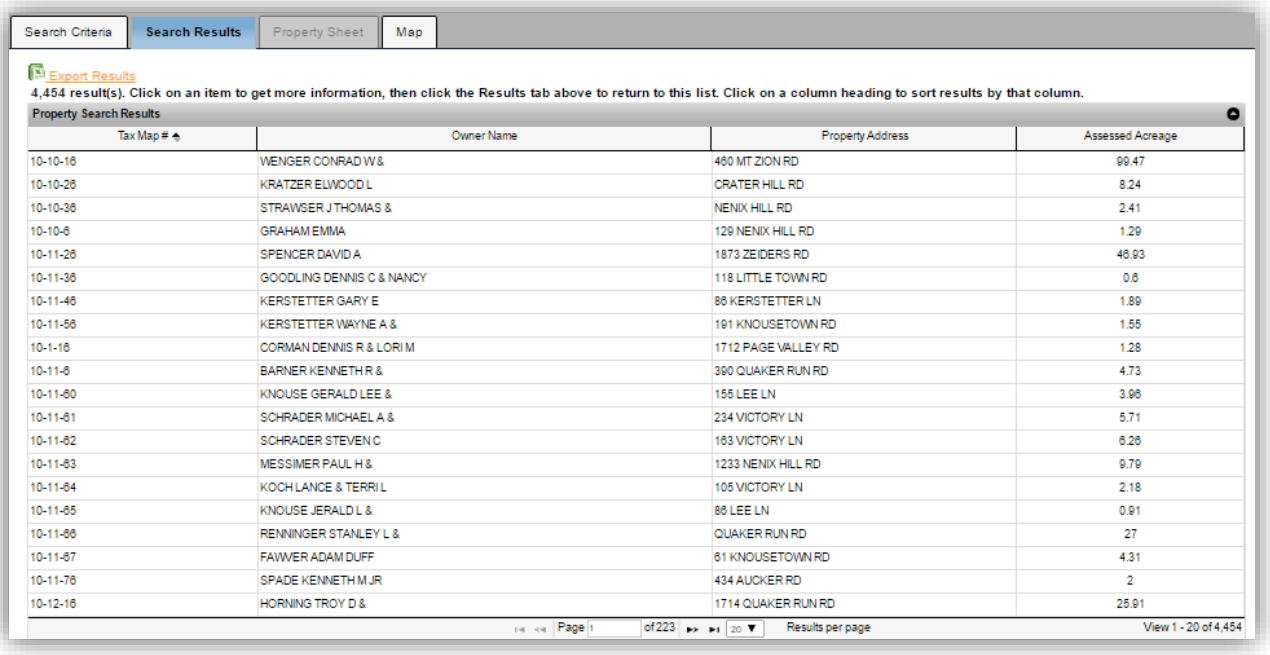
- **Search** – Once the user accepts the checkbox on the home screen, they are taken to the Search Criteria tab. Within the Search tab, dropdown lists, checkboxes and/or auto-complete text boxes will be leveraged to facilitate the composition of searches based on Parcel Number, Address, or other fields customized by the locality. Search elements will be labeled, arranged and grouped logically to improve usability. If search criteria are entered into multiple fields then the resulting records must contain all of the items entered in the search boxes. In many cases, this can yield fewer results than expected, so in most cases it makes sense to enter as little information as necessary when performing a search.
  Once the desired search criteria have been entered, click the "Search" button to be taken to the Results tab which will display the matching records. To clear all search criteria and start over, click on the "Clear All" button and begin typing the new search parameters.



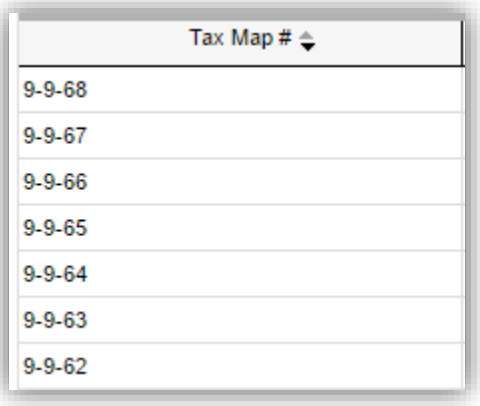
Matches appear in a pop-up list based on the text that has already been entered:



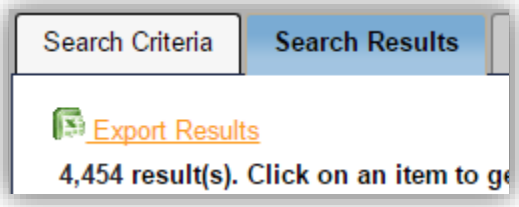
- **Results** – The Search Results tab displays all records that match the criteria from a search that has been run. After a search is run, the user will automatically be taken to the "Search Results" tab to show the matching records. This tab will continue to hold the results from the latest search that is run even after the user has navigated to a different tab. The user can navigate back to this tab at any time to see the results from the most recent search that has been run.
  Result fields can be sorted in ascending or descending order simply by clicking on the name of the field. The first click will sort the field in ascending order and the second click will sort the field in descending order. Each subsequent click will toggle the sort of the column between ascending and descending order. The user can determine the sort field and the sort order of that field at any time by looking for an arrow pointing up or down beside the field name. Clicking on any result will take the user to the Property Sheet tab which will display more information about the selected record.



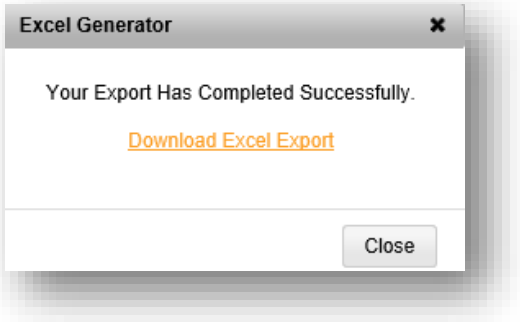
The user can determine the sort field and the sort order of that field at any time by looking for an arrow pointing up or down beside the field name:



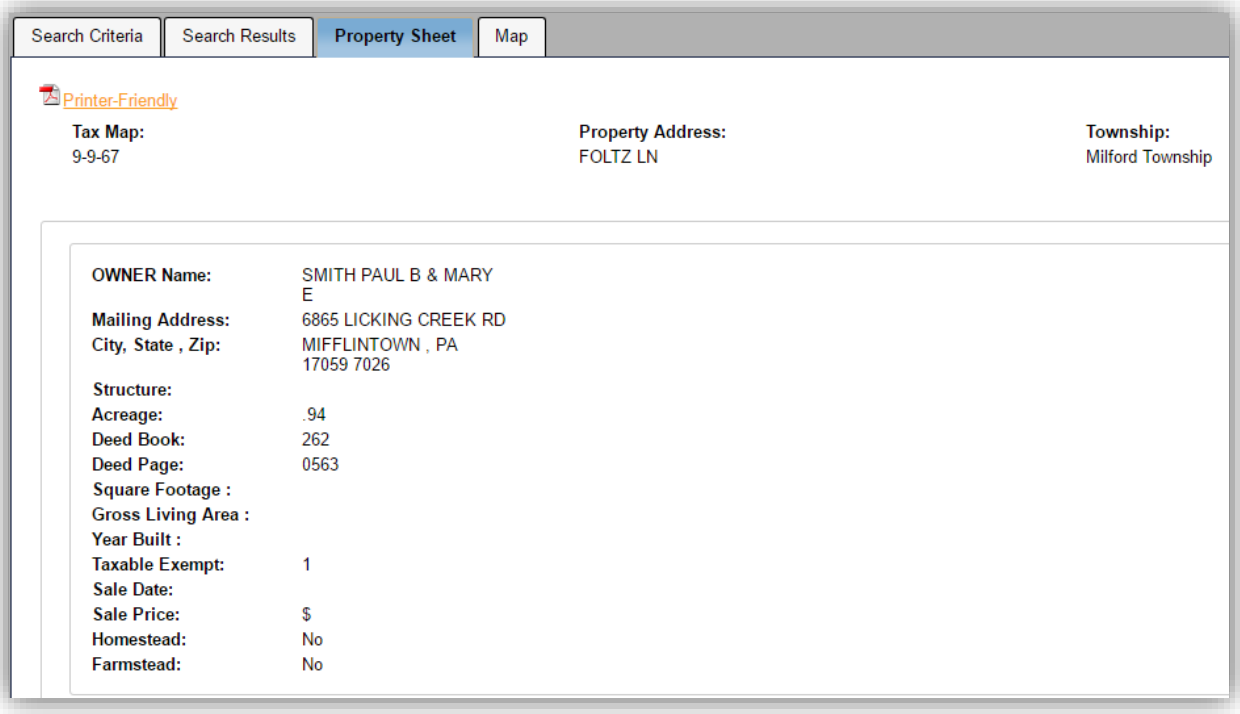
- **Export results** – The user has the option to export a list of results to an Excel spreadsheet by clicking on the "Export Results" link above the search results.



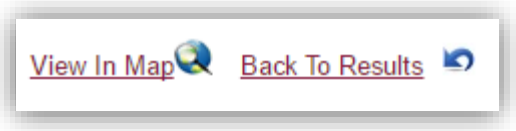
After the file has been created, the application will display a new message indicating that the export has completed successfully. Click on the link to download the Excel spreadsheet.



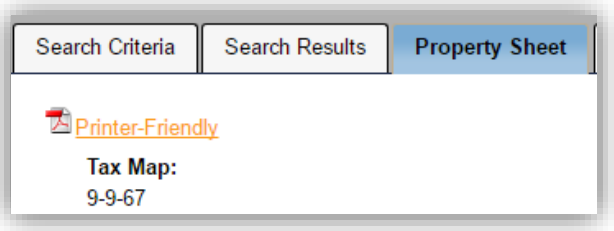
- **Details** – Within the Property Sheet/Details tab, information is divided into multiple subtabs based on the locality's needs. A "General" or "Summary" tab will display information such as Owner Name, Property Description, Assessment Information, Acreage, and other fields related to the selected property. Additional tabs may display information about the structure of the property, improvements, and/or neighborhood sales to name a few. Information is also displayed above these tabs, such as Tax Map Number and Property Address, which do not change during navigation. All data tabs and links are customizable to the individual locality, and based upon data availability.



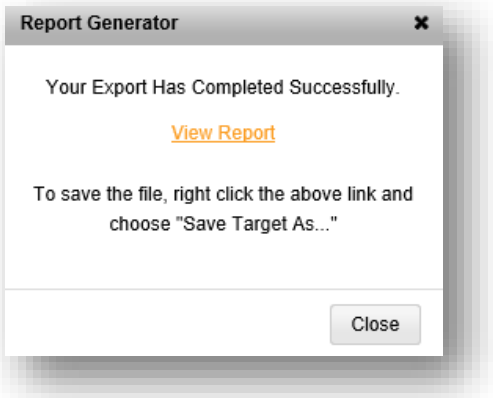
To view the selected property on the map, users can click the "View In Map" link at the top-right of the details tab. A "Back to Results" link is also available which will take users back to the results list.



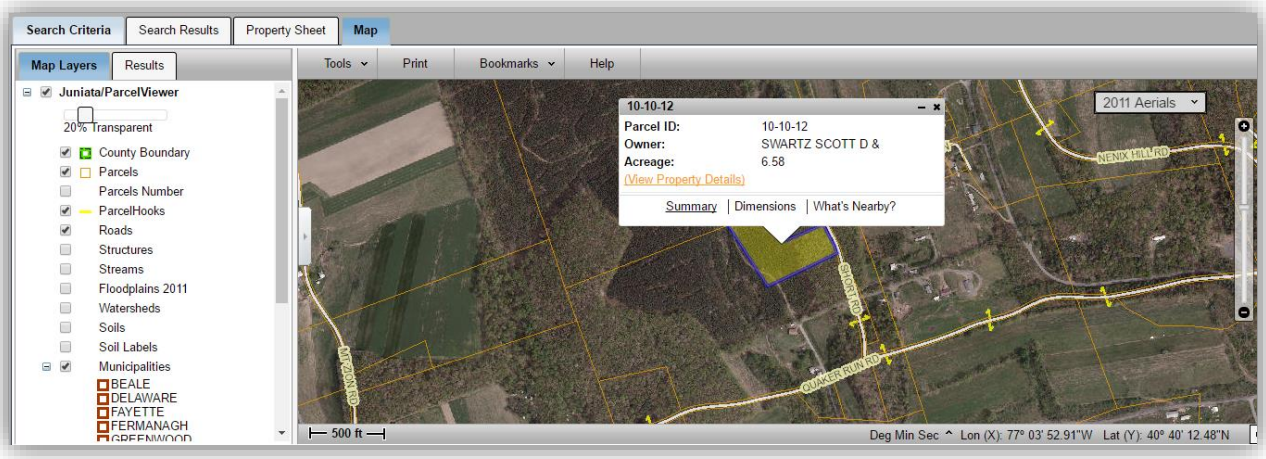
- **Print Details** – Users can click on the "Printer-Friendly" link at the top left of the page to generate a pdf file that contains information that is formatted for printing. The resulting pdf file is formatted to fit an 8.5 x 11 page in portrait orientation and contains a printable version of all of the information displayed in the subtab sections, along with a map showing the resulting parcel against the default basemap for the locality.



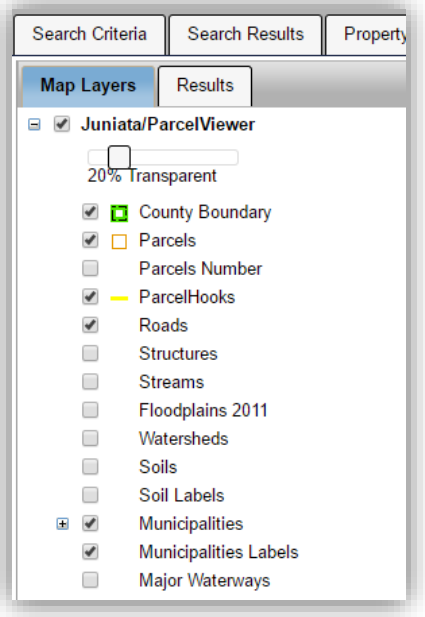
After the pdf file has been generated, a message will display which will prompt you to view or download the file.



- **Map** – When a user clicks on the “View in Map” link in the results or in the details, it will automatically take them to the Map tab, which will zoom to the result’s location on the map, highlight the map record and display a “bubble” window with summarized details on the search result. Where other external data is available on the result, hyperlinks will be available in the bubble window, allowing users to open links to external data. One example is the “View Details” link which opens a link to the Details tab for the selected parcel.
  Alternatively, users can click on the Map tab at any time to interact with parcels and other GIS layers without searching. Depending on your web browser, you can remove the browser header information by using the F11 key on your keyboard. This will provide you with more room to see the map on your screen. The Map tab consists of a Map Layers window, Results window, imagery dropdown, and additional tools.

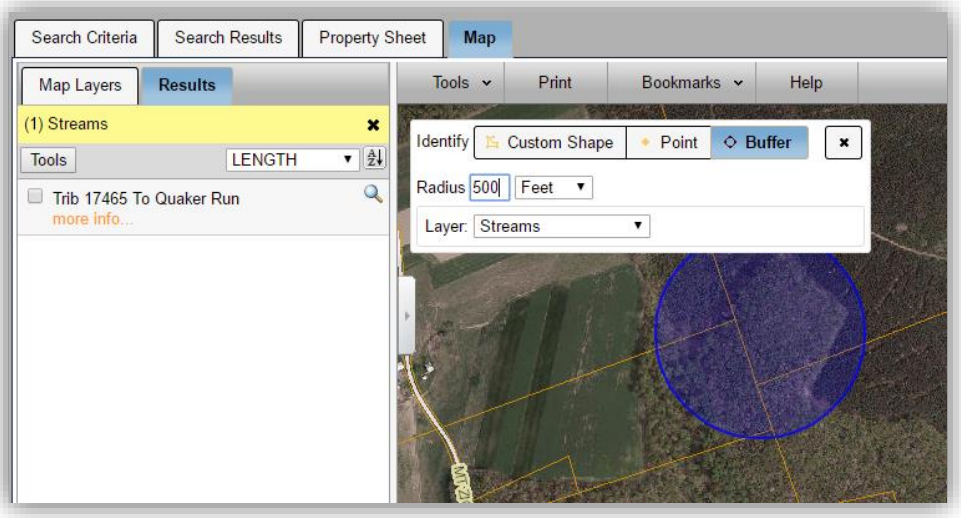


- **Map Layers** – The web mapping application has a number of map layers available with it. These map layers have names, legends and may be grouped together. To expand a grouped layer, click on the plus sign to the left of any layer that is displayed in bold. You can turn the map layer on and off by clicking on the checkbox beside the map layer. Due to the size or content of the data, some data layers may not be available at all scales. If a map layer is grayed out then the layer is not available for display at the current zoom level. To make these layers become available, zoom in on the map until they are no longer grayed out.
  The transparency of the map layers can also be adjusted by using the transparency slider at the top of the layer list. By default, all of the map layers are set to a transparency of 20%.

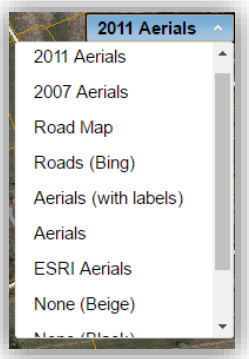


- **Results** – Once features have been identified on the map using one of the map tools, you can investigate the results using the Results tab in the TOC. The layer name and number

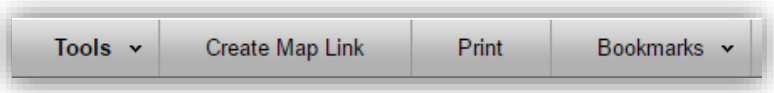
of returned records will be provided. To open the returned records, click on the layer name in the Results tab. To view detailed attributes for a record, click on "more info…"



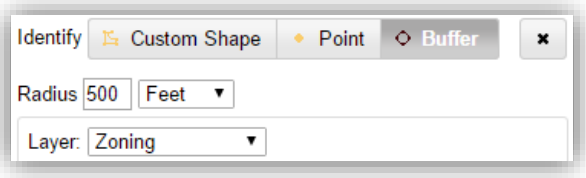
- **Imagery** – The web mapping interface allows you to easily access commonly used background data. By default, the current background data layer is displayed first. Click on the box near the top right of the map to see a list of all available Background data layers, which may include multiple years of aerial photography .
  When you choose a background dataset, it will always be available and the map layers you turn off or on in the map layer list will be displayed on top of the background. You can also toggle between two background datasets using the swipe tool (which is described in the "Map Tools" section), which can be useful to detect changes between two aerial photo flights.



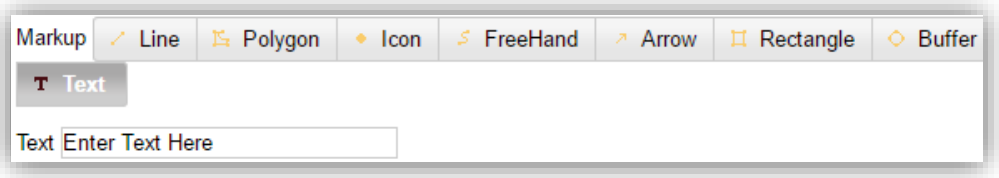
- **Tools** – All tools are available at the top of the mapping menu. When you open a tool, options are available for using the tool. You can continue to navigate on the map – zoom, pan, and change the extent of the map – while using any of the tools. This means that you can measure, markup, print, and use other tools and still change your current extent on the map. You can also right-click on the map at any time to bring up the option to Export the current view or to insert a pushpin marker on the map. Choosing the "Export Current View" option will open the Print menu. Choosing the "Add Pushpin Marker Here" option will insert a pushpin on the map and will send the pushpin to the Markup tool.



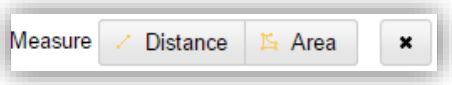
- **Advanced Identification** — The advanced identify tool allows users to identify any map features via user specified points, polygons, and location buffers. The tool can also be used to identify adjacent parcels.



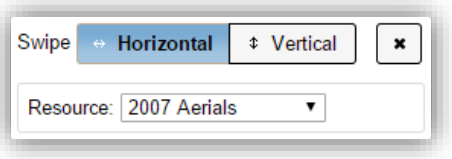
- **Map Mark-up** — A robust set of mark-up tools allow users to create printable linear, polygonal, and text mark-ups on the map. The Markup tool is used to create geographically referenced and/or feature-linked graphics and text which can be displayed on the map at varying scales. Users can select from polygonal, linear, circular and text markup types. Users can control markup outline / fill color and transparency, line width as well as modify graphics and text after it is created.



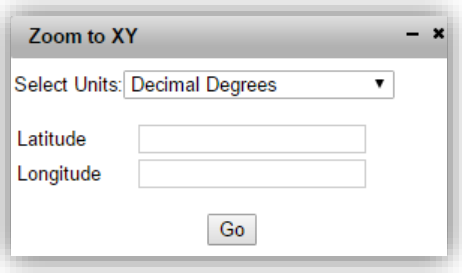
- **Measure** — Users can measure distance and area in user selected units. Measurements are calculated client-side, for instantaneous, live updating results, in similar fashion to map mark-ups, measure sketches are user editable.



- **Transparency / Swipe** — The Transparency tool allows users to interactively adjust map layer overlay transparency, while the Swipe tool allows users to interactively hide / reveal live mapping layers.

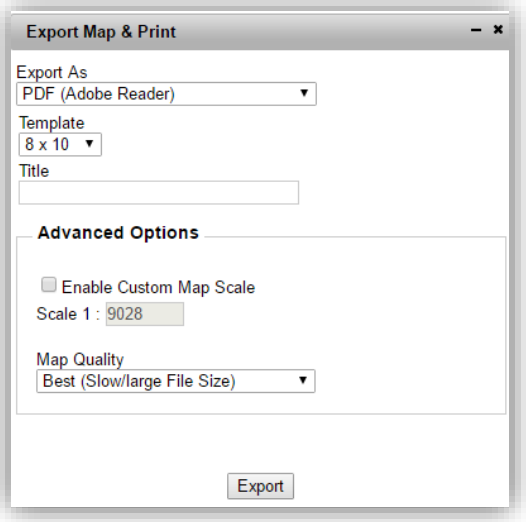


- **Zoom to XY** — Zooms the map to a user-specified coordinate location entered as decimal degrees, degrees / minutes / seconds, or native map units.



- **View In** – The View In tool gives you the choice to view the currently displayed mapping area in Google or Bing Maps. For Google Maps, you can choose to view in Roads, Aerials, Hybrid, or Earth mode. For Microsoft Bing Maps, you can choose to view in Roads, Aerials, Hybrid, or Bird's Eye mode. The Google and Microsoft Bing Maps views will be launched in a new browser tab, and you can change to any viewing mode once the new window has opened.

- **Print/Export** — The Export & Print tool allows the user to define an image size and format (PNG, JPEG, GIF). Alternately, the user can create a PDF export of the map, based on one or more map document layouts, which can include legend, scale bar, north arrow, logos, and disclaimer text elements. Regardless of format, the export image area is previewed for the user in the map frame prior to creation. Attributes of search results may also be exported to Microsoft Excel spreadsheet format (.xls).



- **Bookmarks** – The Bookmark tool allows you to quickly zoom to specific locations on the map. Click on the named bookmark that you want to use and the map will zoom to that bookmark extent.

4. Requirements & Specifications

The following are requirements for proper functionality of the ArcGIS Server Map Viewer application by WorldView Solutions:

- **End User Client System:** The application using the ArcGIS API for JavaScript supports the following browsers: Internet Explorer 8+, Mozilla Firefox 2+, Apple Safari 2+ and Google Chrome 1+. The application will also support use on mobile devices: Safari on iOS, Android and Chrome on Android.

- **Network Requirements**: The following are the minimum network requirements for the ArcGIS Server web mapping application:
    - **Internal LAN Connectivity:** 10 / 100 mbps
    - **Server Connectivity:** 100 mbps