

HISTORICAL AERIAL PHOTOGRAPHY, 1938 SALT LAKE AQUEDUCT PROJECT, SALT LAKE, UTAH, AND WASATCH COUNTIES, UTAH

by Steve D. Bowman and Keith Beisner



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UTAH GEOLOGICAL SURVEY
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INTRODUCTION

This compilation of the 1938 Salt Lake Aqueduct Project includes 183 scanned aerial photograph prints (frames) taken as part of the U.S. Bureau of Reclamation (USBR) Salt Lake Aqueduct Project. The Salt Lake Aqueduct was constructed between 1939 and 1951 to carry water from the Provo River at Deer Creek Reservoir to Salt Lake City, Utah.

This compilation covers the area from Heber City, Utah, down Provo Canyon to Orem, Utah, and north along the Wasatch Front to the Fort Douglas/University of Utah campus area. These aerial photographs will be useful for professionals involved with geologic, geotechnical, and environmental assessment and investigation projects; land-use planning; governmental agencies; and the general public and others as an historical archive.

SCANNING AND INDEXING

Each grayscale aerial-photograph-frame print was scanned on an Epson 1640XL scanner, using an 8-bit grayscale color space at a resolution of 600 dots per inch (dpi) (42 microns) with unsharp mask enhancement. The resultant image scans were saved in the Tagged Image File Format (TIFF) with no compression. Each image TIFF file was sharpened once using Paint Shop Pro (PSP) version 8 to reduce scanning artifices. Frames 2-41 and 2-42 were missing in our collection and were scanned by Double Delta Industries, Inc., of Woodbine, Maryland, from the original film collection at the National Archives, Cartographic and Architectural Section, in College Park, Maryland. These two frames were scanned on a Microtek 1000XL scanner, using an 8-bit grayscale color space at a resolution of 600 dpi (42 microns).

As a complete line index map is not available for the 1938 Salt Lake Aqueduct aerial photographs, the center point of each image scan was determined using a grid in PSP. This center point location was then compared to modern Google Earth imagery to determine approximate coordinates in the simple cylindrical (Plate Carree or

latitude/longitude) projection, WGS84 datum. These center point coordinates were then used to create index maps as a Google Earth KMZ file and as an Environmental Systems Research Institute (ESRI) shapefile (SHP) for use in GIS software.

DIGITAL FILES

A compressed keyhole markup language (KMZ) file was developed in Google Earth version 4.3 with photograph center points indicated as placemarks. Each placemark contains an embedded thumbnail (reduced resolution) image of the corresponding image frame for reference and ease in locating aerial photograph frames. The latest version of Google Earth may be downloaded from: <http://earth.google.com>.

A shapefile was developed in ESRI ArcGIS 9.2 software, utilizing the point geometry type and the Universal Transverse Mercator (UTM), Zone 12 North, NAD83 coordinate system. This shapefile contains an attribute table with frame information where known, including approximate frame center point coordinates, scan filename, flight line number, frame number, film type, exposure (acquisition) date and time, image scale, scanner model, and scan resolution. Additional information about the frames, such as camera and film specifications, is not available.

For users without ArcGIS or other GIS software, the shapefile may be viewed using ESRI's ArcExplorer software available from: <http://www.esri.com/software/arcgis/explorer/index.html>.

A complete index map is included on the DVD as plate 1 in Adobe PDF format. The base map for plate 1 utilizes U.S. Department of Agriculture (USDA) 2006 National Agriculture Imagery Program (NAIP) statewide orthophotography for easy reference to current cultural features. Two flight line sketch maps are included on the DVD in Adobe PDF format. These sketch maps were prepared by the U.S. Geological Survey in data archiving activities and were scanned by Double Delta Industries, Inc., of Woodbine, Maryland, from the original project document collection at the National Ar-

chives, Cartographic and Architectural Section, in College Park, Maryland.

PDF files may be viewed using the free Adobe Reader software. The latest version of the software may be downloaded from: <http://www.adobe.com/products/acrobat/readstep2.html>. We recommend that Adobe Reader version 9 or later should be used to view the index map for enabling geospatial features.

Once individual frames are identified from the indices, the corresponding high-resolution TIFF files may be located on the \Auto-Play\Docs\Images directory of the DVD disk.

LIMITATIONS

Due to the age of the aerial photograph prints, many of the prints contain various markings from previous use. These markings may include alignment marks and lines, named geographic features, fault traces, and other features. None of these markings have been verified for accuracy in location and/or classification. As a result, these markings should not be relied upon for any purpose.

Since the aerial photograph frame-center points are estimated, some undetermined positional error exists between the frame center points and actual ground locations.