



# **UTAH'S GREAT SALT LAKE**

**AN  
INTRODUCTION  
AND OVERVIEW**

**BY  
WALLY GWYNN  
UGS**

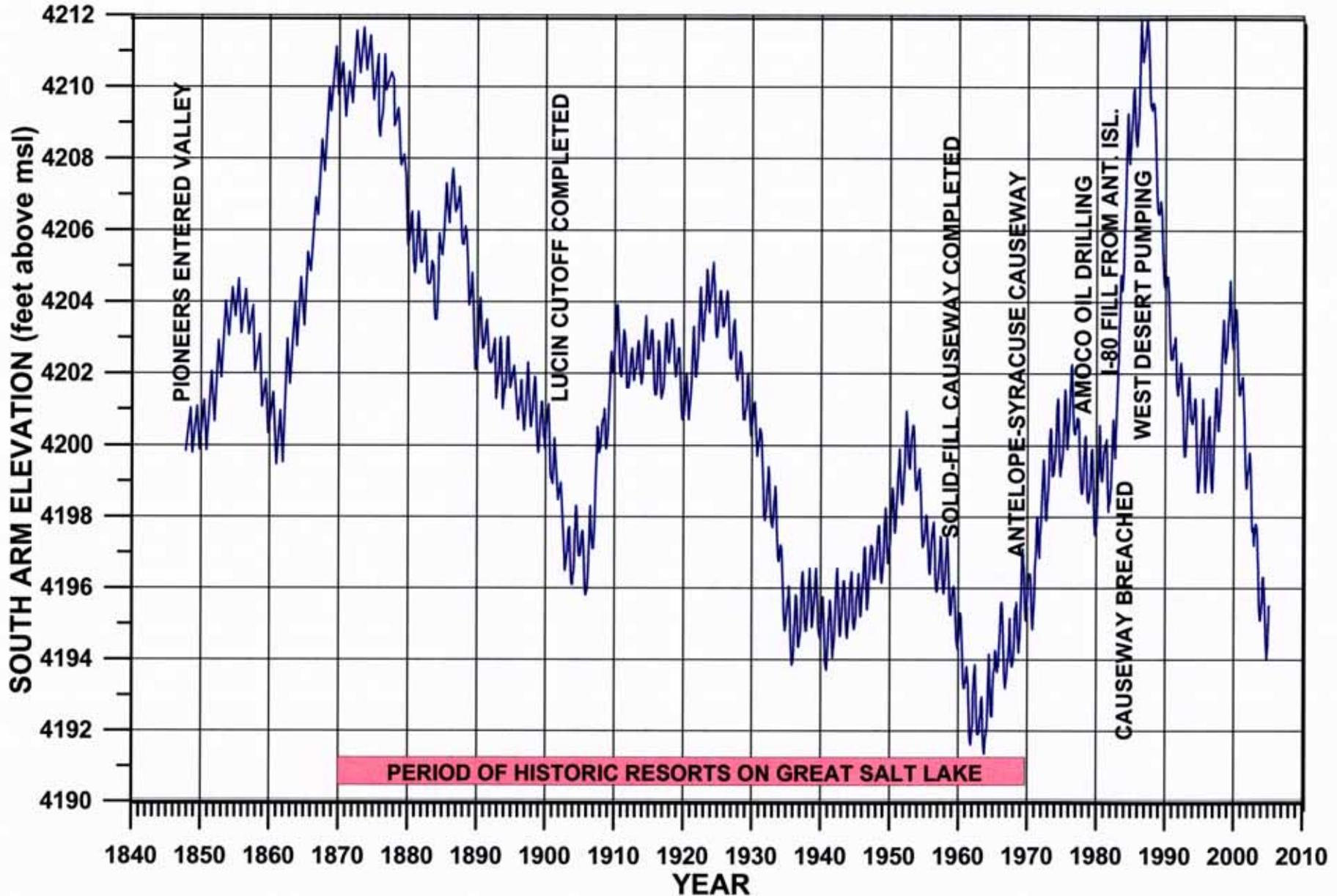


# ELEMENTS OF GREAT SALT LAKE

AND

# SURROUNDING AREAS

# GSL HYDROGRAPH AND HISTORIC EVENTS





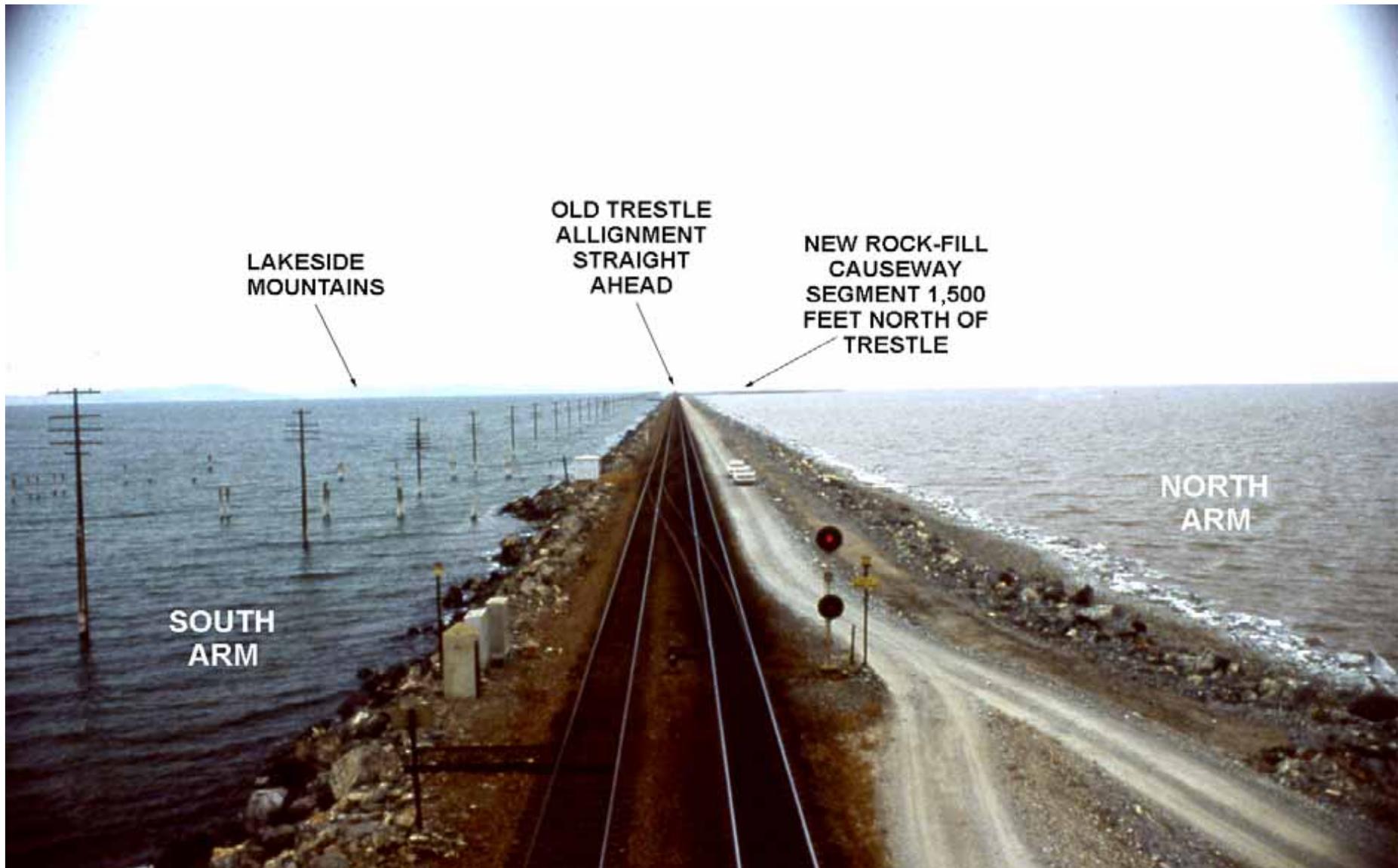
**ORIGINAL 13-MILE-LONG WOODEN TRESTLE  
ACROSS LAKE COMPLETED IN 1904. WOOD FROM  
THE TRESTLE IS BEING SALVAGED BY CANNON  
INDUSTRIES' – TRESTLEWOOD DIV.**



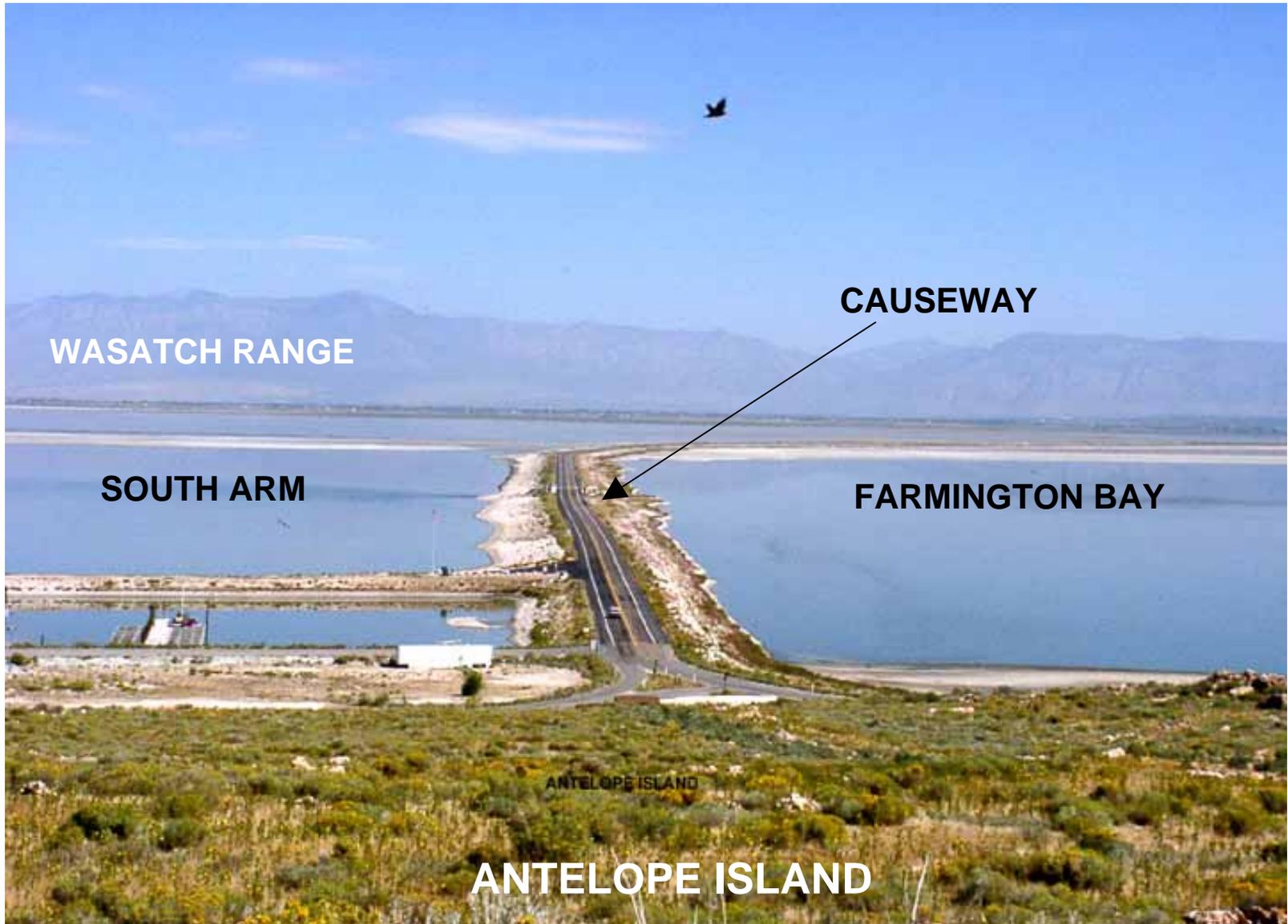
**LOADING FILL MATERIAL FROM THE LITTLE VALLEY QUARRY FOR THE CAUSEWAY ONTO A BARGE IN LITTLE VALLEY HARBOR**



**UNLOADING FILL MATERIAL FROM LITTLE VALLEY ROCK QUARRY FOR THE CAUSEWAY FROM SIDE-DUMP RAIL CARS**

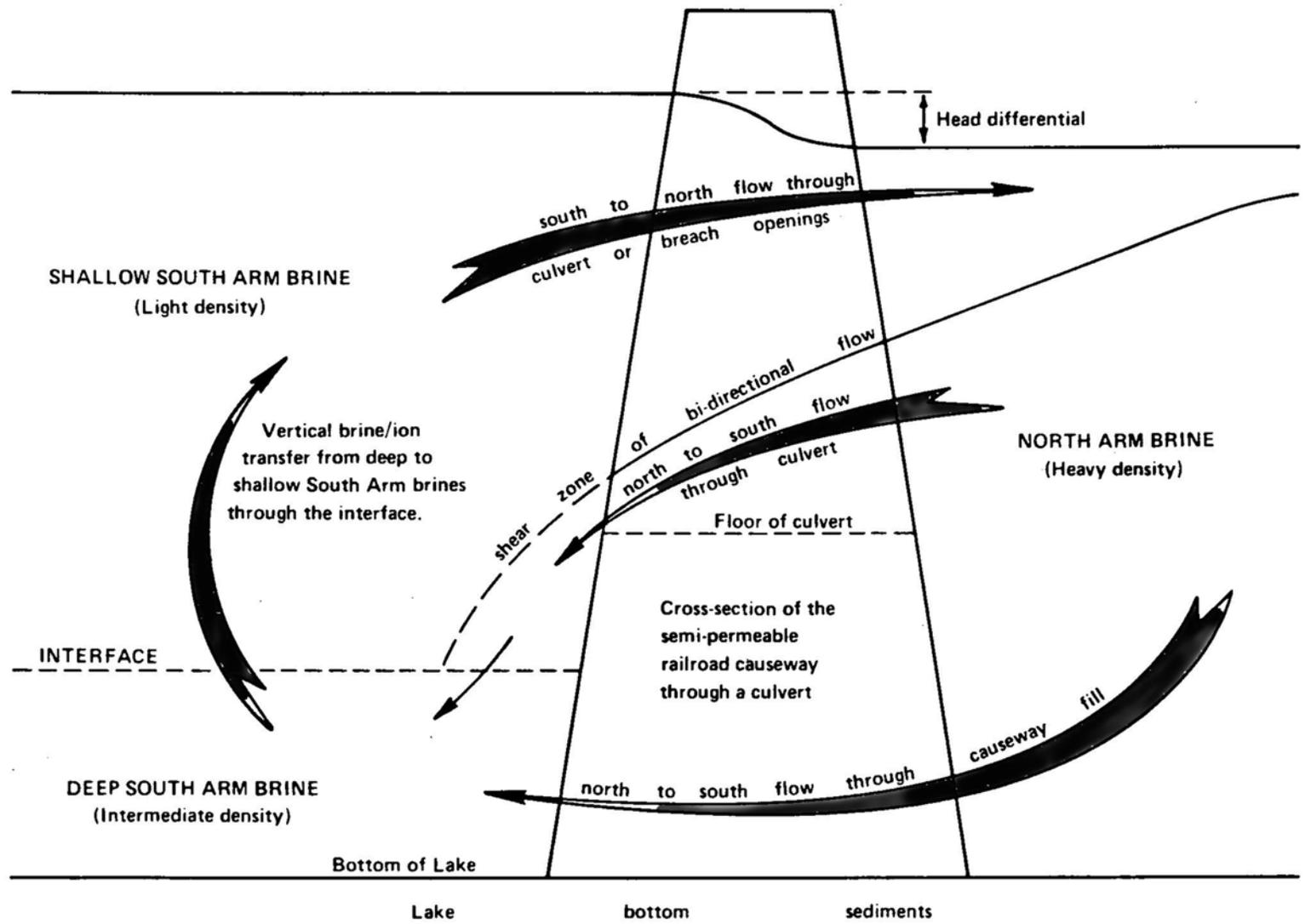


**UNION PACIFIC'S 21-MILE RAILROAD CAUSEWAY  
ACROSS GREAT SALT LAKE – VIEW LOOKING WEST  
FROM PROMONTORY POINT TOWARDS LAKESIDE**

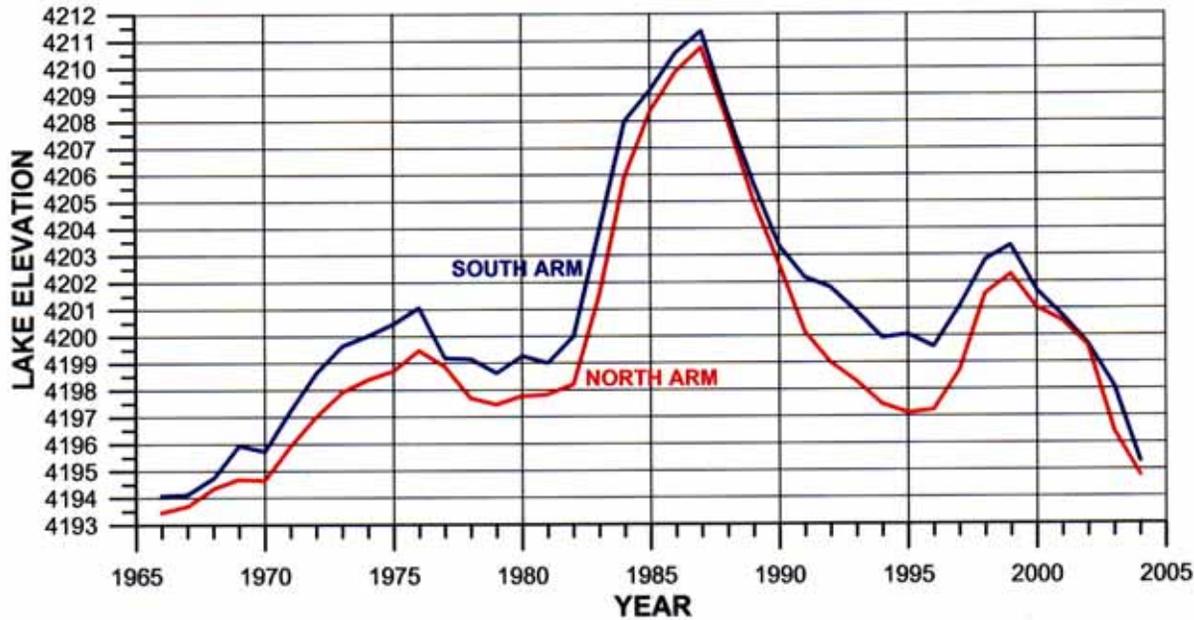


**VIEW OF ANTELOPE-STANSBURY 7-MILE CAUSEWAY  
VIEW LOOKING EAST TOWARDS THE WASATCH  
RANGE. INITIALLY BUILT IN 1969.**

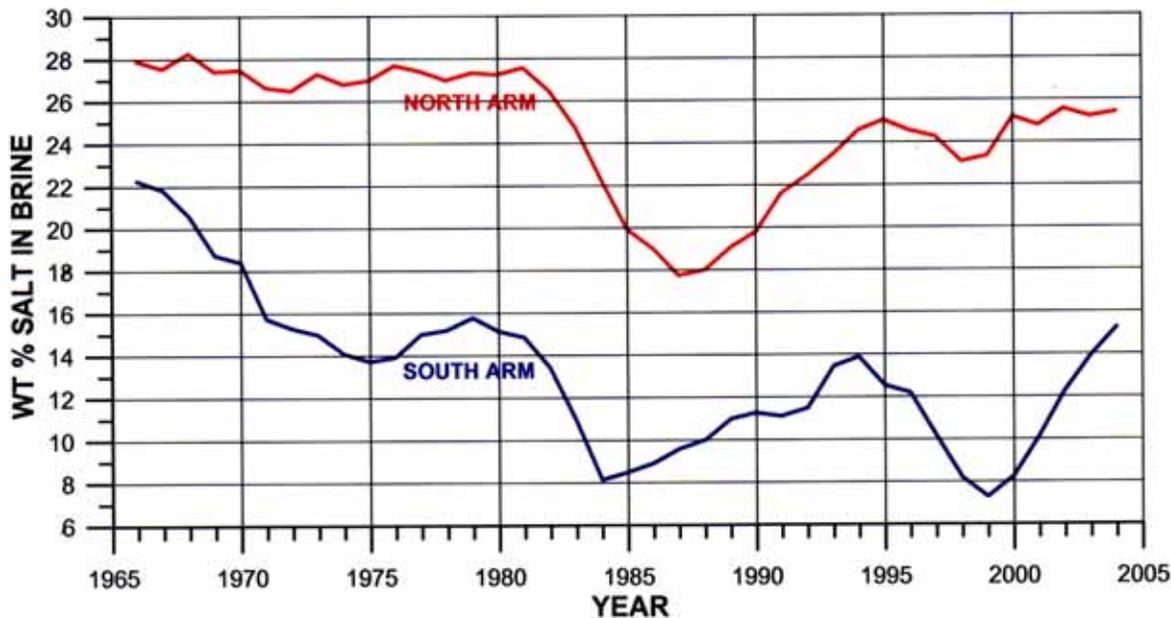
VIEW LOOKING WEST



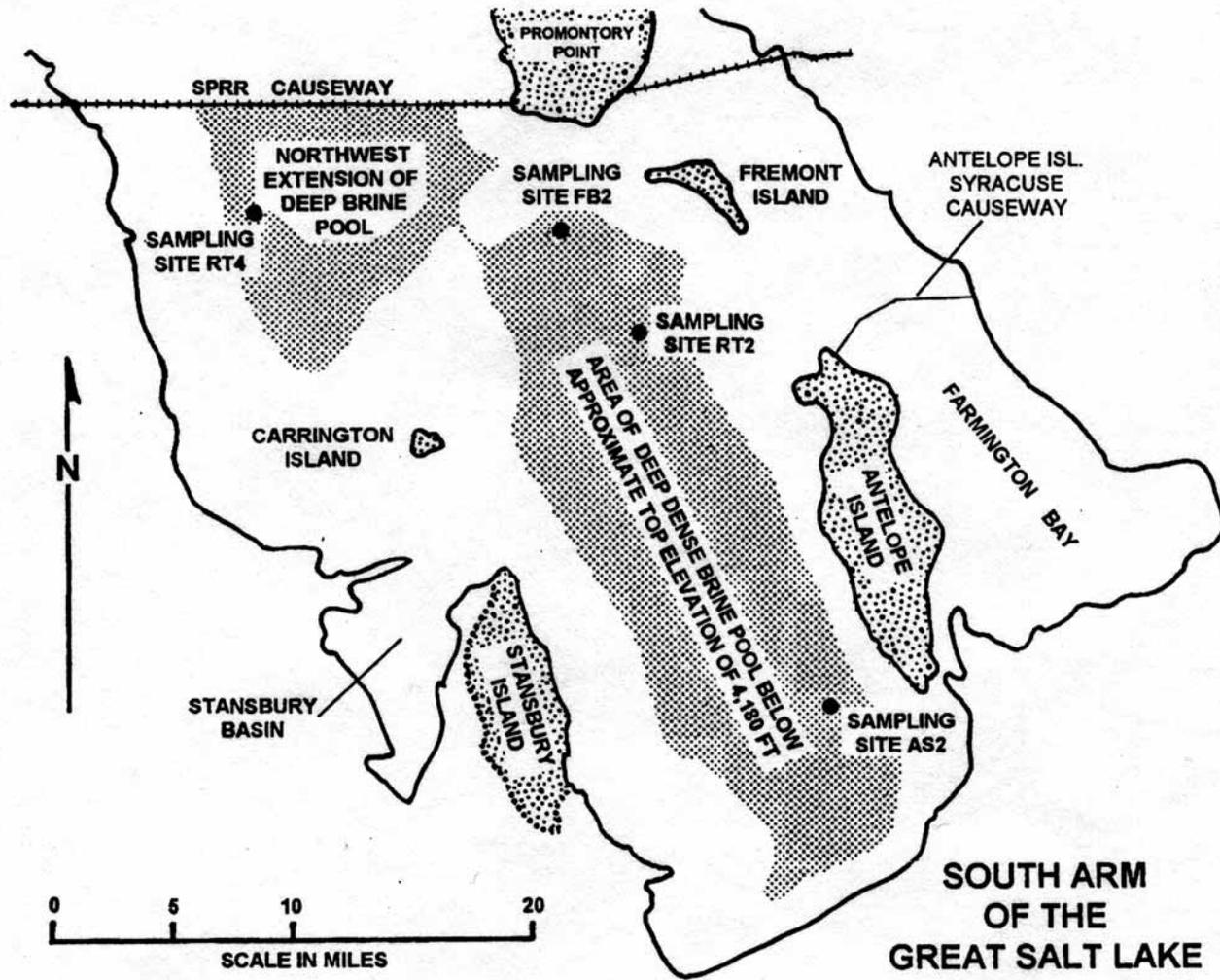
**ILLUSTRATION OF BI-DIRECTIONAL FLOW THROUGH THE CAUSEWAY CULVERTS, BREACH, AND FILL**



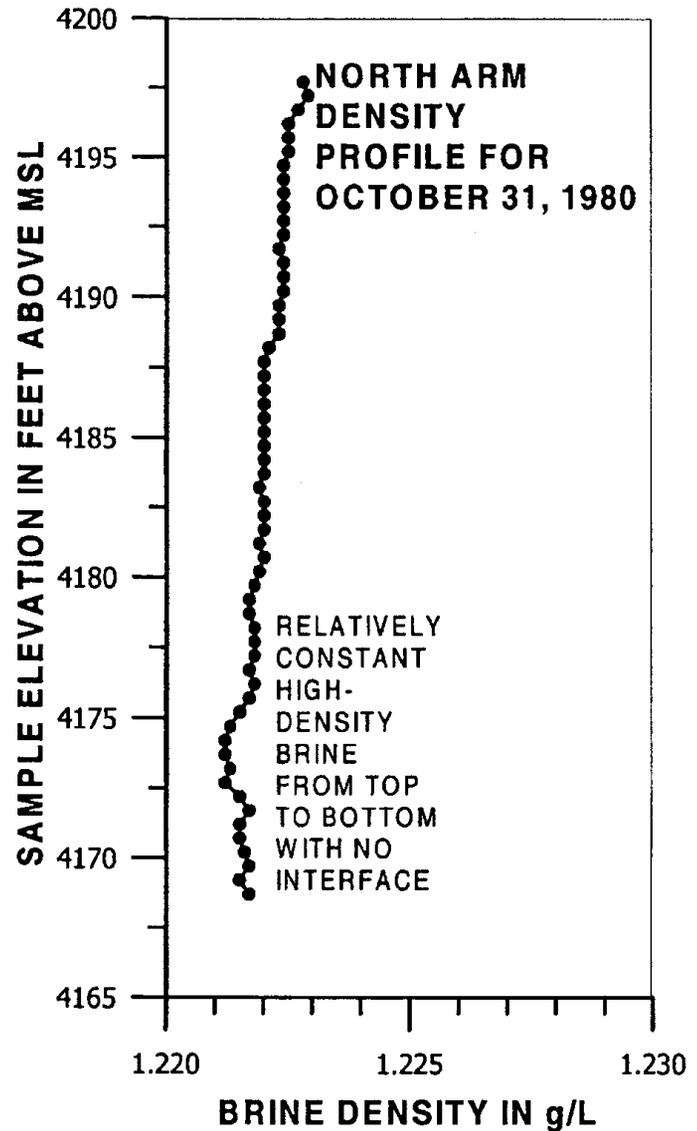
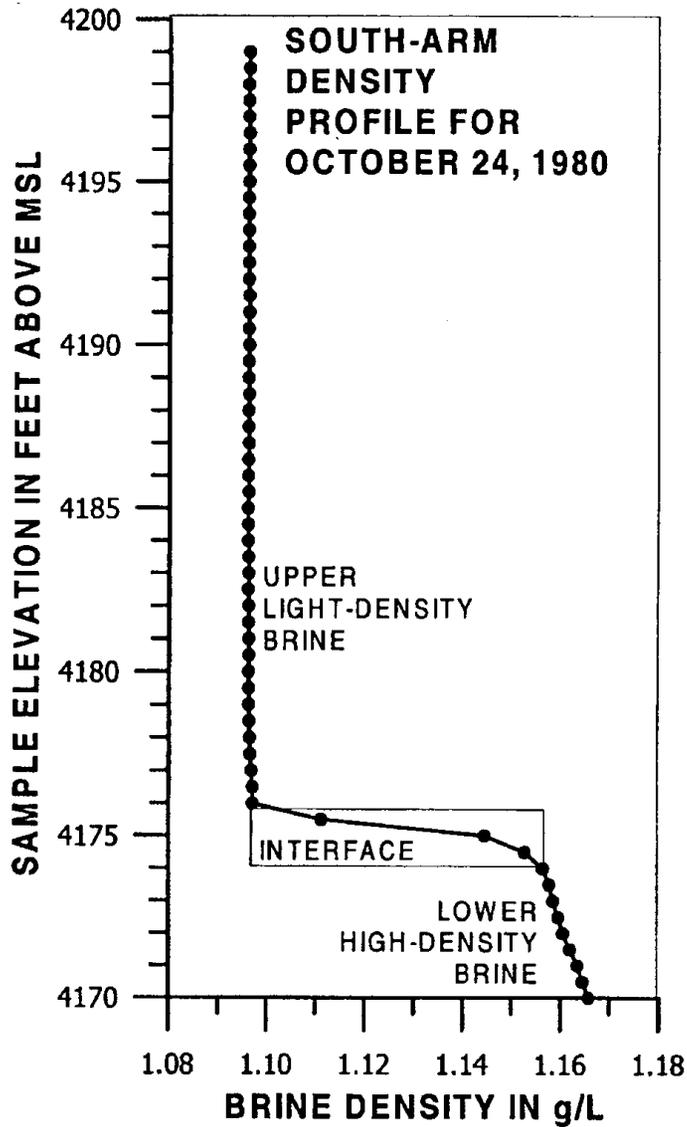
# NORTH AND SOUTH ARM ELEVATIONS OVER TIME



# NORTH AND SOUTH ARM WT% SALT IN BRINE OVER TIME

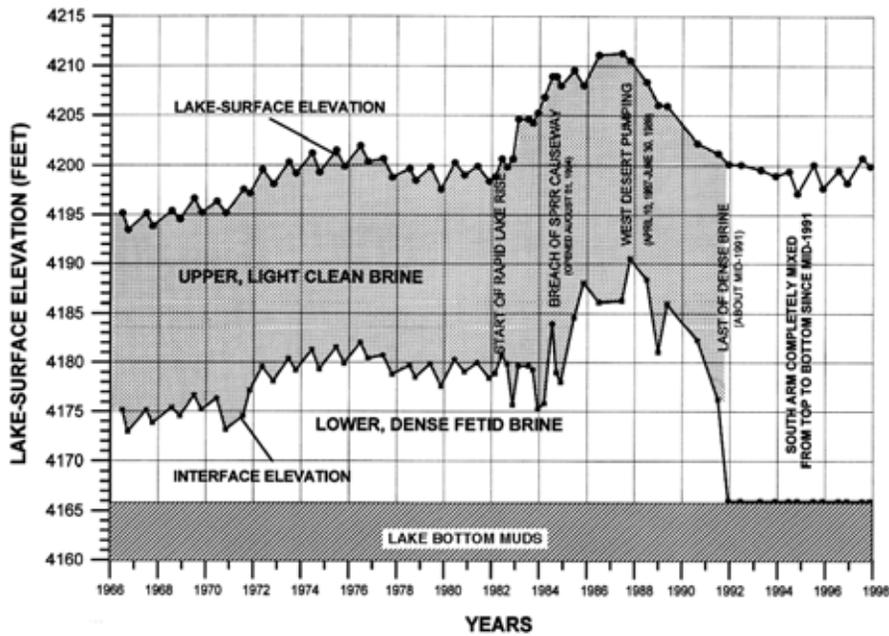


**POSITION OF DEEP BRINE POOLS IN SOUTH ARM OF THE GREAT SALT LAKE UP TO LATE 1980s AND AGAIN IN RECENT YEAR OR SO.**

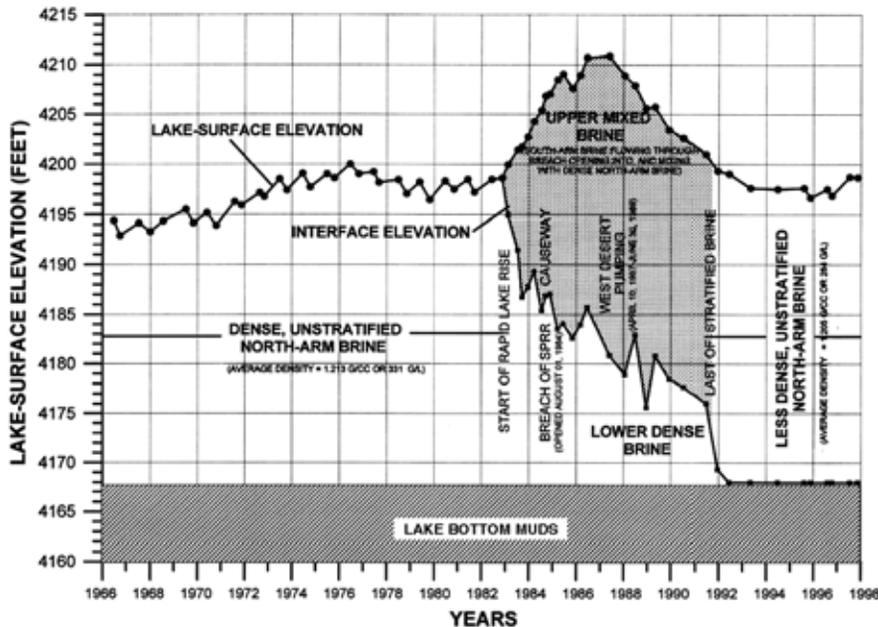


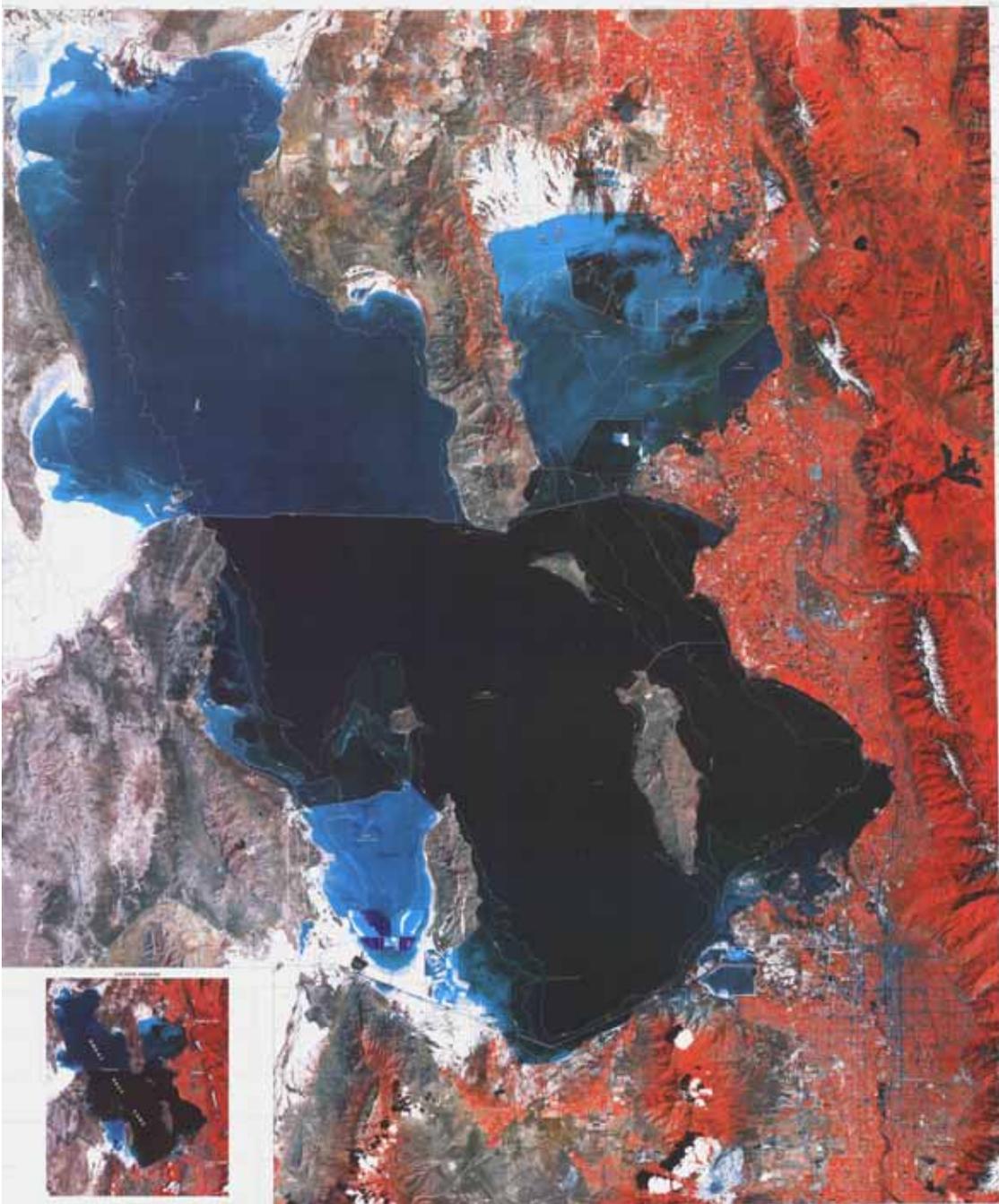
**TYPICAL DENSITY PROFILES FOR SOUTH AND NORTH ARMS OF GREAT PRIOR TO 1980s FLOODING**

**UPPER (LIGHT) AND LOWER (DENSE) SOUTH ARM BRINES SEPARATED BY INTERFACE. AFTER 1992, STRATIFICATION IS GONE UNTIL ABOUT 2001 OR 2002**



**NORTH ARM BRINE BECOMING STRATIFIED DURING THE 1980S FLOODING THEN BECOMING NON-STRATIFIED AFTER ABOUT 1991**





**GREAT SALT LAKE  
NEAR ITS HISTORIC  
HIGH**

**A GREAT DEAL OF  
FLOODING TOOK  
PLACE AROUND  
THE LAKE – MAINLY  
AROUND THE  
SOUTH END  
CAUSING MILLIONS  
OF DOLLARS OF  
DAMAGE TO ROADS,  
RAILROADS,  
INDUSTRIES AND  
RECREATION  
FACILITIES.**



**THE RAILROAD CAUSEWAY WAS BREACHED NEAR LAKESIDE (WEST END OF CAUSEWAY) IN 1984 TO HELP LOWER THE FLOODING AROUND THE SOUTH ARM**



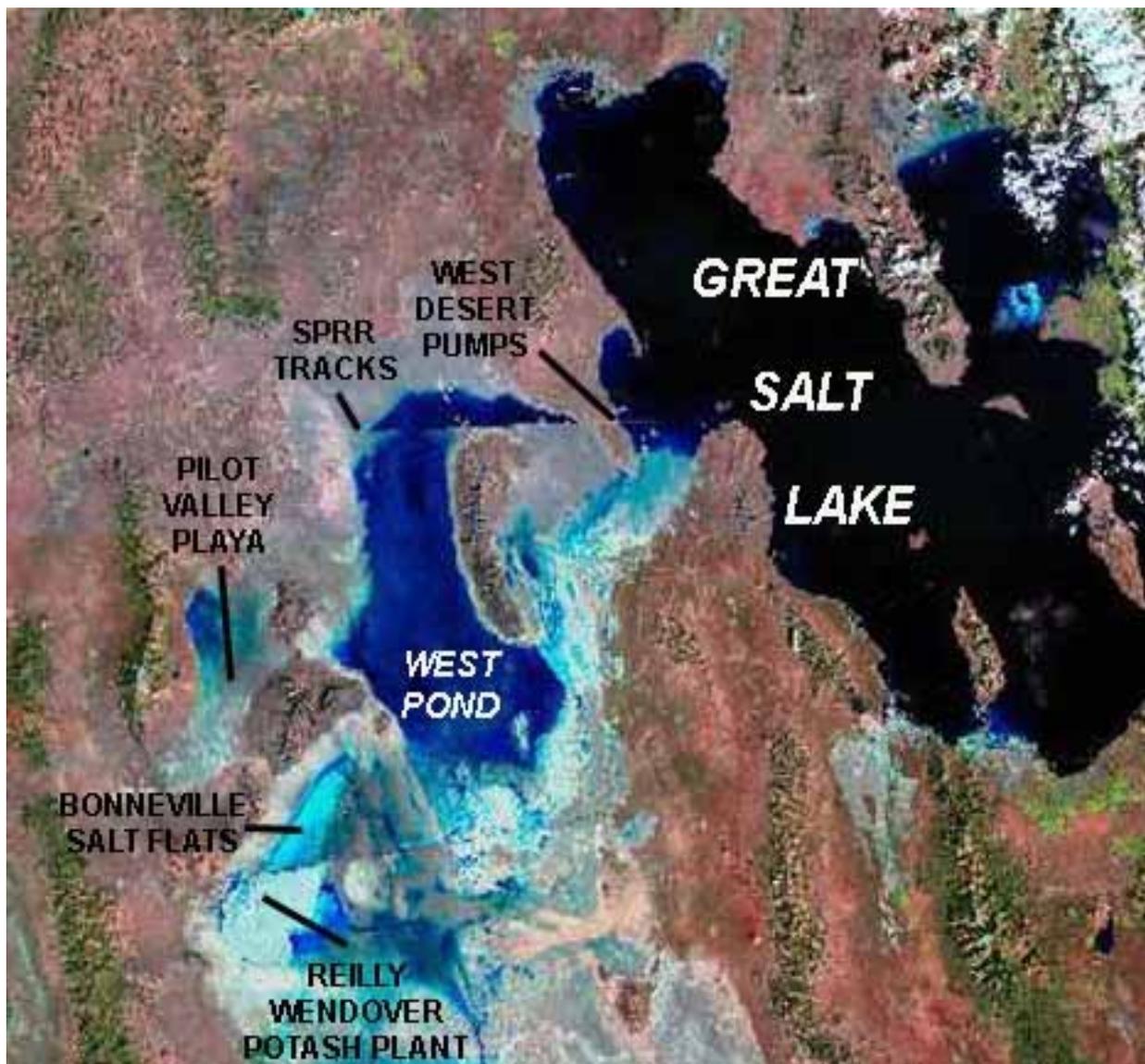
**RUSH OF SOUTH-ARM WATER INTO THE NORTH ARM AS THE BREACH IS COMPLETED. THE HEAD DIFFERENTIAL OF NEARLY 3.5 WAS REDUCED TO LESS THAN 1 FOOT IN ABOUT TWO MONTHS**



**WEST DESERT PUMPING STATION LOCATED WEST OF THE LAKE AT HOGUP RIDGE – 1986. WATER IS PUMPED THROUGH A 4.1-MILE CANAL TO THE WEST POND.**



**INLET SIDE OF PUMPING STATION – THE STATION  
CONTAINS 3 PUMPS EACH WITH A 1000 CFS CAPACITY**



## **ELEMENTS OF THE WEST DESERT PUMPING PROGRAM**

**THE PROJECT  
WAS  
DESIGNED TO  
ADD  
ADDITIONAL  
EVAPORATIVE  
CAPACITY TO  
GREAT SALT  
LAKE - 1987**



**GREAT  
SALT LAKE  
AT ITS 2004  
LOW LEVEL**

**NOTE THE  
LAND-  
LOCKED  
ISLANDS  
AND  
EXPANSIVE  
MUD FLATS  
AROUND  
THE LAKE**

# ENLARGED VIEW OF ANTELOPE ISLAND IN 2004

**EXPOSED MUD FLATS CAUSED SOME CONCERN ABOUT POTENTIALLY CONTAMINATED DUST BEING BLOWN INTO POPULATED AREAS AROUND THE LAKE**



**SOUTH ARM OF  
GSL**

**STANSBURY  
ISLAND**

**U.S.  
MAGNESIUM**

**CARGILL  
SALT**

**MORTON  
SALT**

**STANSBURY  
MOUNTAINS**

**VIEW OF THREE MINERAL  
EXTRACTION OPERATIONS  
ON THE SOUTH END OF  
GREAT SALT LAKE.**

**SALT (NaCl) HAS BEEN  
EXTRACTED FROM GSL  
SINCE THE MID-1800S TO  
THE PRESENT TIME.  
SINCE THEN, OTHER  
PRODUCTS HAVE BEEN  
ADDED TO THE LIST OF  
MINERALS EXTRACTED  
FROM THE LAKE LIKE  
FERTILIZER, MAGNESIUM  
AND CHLORINE GAS**



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**GREAT SALT LAKE MINERALS CORP. LOCATED  
WEST OF OGDEN ON THE EAST SIDE OF  
PROMONTORY MOUNTAINS IN BEAR RIVER BAY**



**THE BEHRENS TRENCH, A 21-MILE UNDERWATER, CANAL, IS USED TO TO CARRY CONCENTRATED BRINE FROM PONDS ON THE WEST SIDE OF THE LAKE TO GSLM'S PUMP STATION AT PROMONTORY POINT.**



**AMOCO DRILLED FOR OIL IN THE LATE 1970s AND ESTABLISHED THE WEST ROZEL OIL FIELD JUST WEST OF ROZEL POINT (NEAR THE SPIRAL JETTY). A BLACK, HIGH-SULFUR OIL WAS PRODUCED BEFORE THE WELLS WERE PLUGGED AND ABANDONED.**



**EQUIPMENT LEFT FROM YEARS OF OIL DEVELOPMENT AT ROZEL POINT STARTING IN ABOUT 1904. AN EPA-FUNDED CLEANUP CAPPED SOME 34 LEAKING WELLS**



**FROM 1979 TO 1980, FILL MATERIAL WAS TAKEN FROM ANTELOPE ISLAND VIA A 13-MILE-LONG CONVEYOR BELT SYSTEM TO BUILD PART OF I-80 WEST FROM SALT LAKE CITY**



**I-80 END OF 13-MILE-LONG CONVEYOR BELT FROM THE SOUTH END OF ANTELOPE ISLAND.**



**VIEW OF THE SPIRAL JETTY NEAR ROZEL POINT.  
THE ROAD OUT TO THE ABANDONED ROZEL POINT  
OIL-FIELD WELLS IS ALSO SHOWN**