

A DETAILED RESISTIVITY SURVEY WITH
REFERENCE TO THE CAUSE OF THE
MAGNETIC ANOMALY IMMEDIATELY SOUTHEAST OF
SAINT CHARLES, IN SAINT LOUIS COUNTY, MISSOURI

by

WILLIAM W. SCHWENDINGER, B.A.

Thesis Presented to the Faculty of the Graduate
School of Saint Louis University in Partial
Fulfillment of the Requirements for the
Degree of Master of Science

1950

TABLE OF CONTENTS

	Page
LIST OF TABLES	iv
LIST OF ILLUSTRATIONS	v
Chapter	
I. INTRODUCTION	1
The Problem	1
Approach to the Problem	4
Location and Physical Features of the Area	5
Acknowledgements	9
II. REVIEW OF THE PLEISTOCENE AND MISSISSIPPIAN	11
The Pleistocene and the Lower Missouri River	12
Deposits of the Alluvial Plain	15
Near-Surface Stratigraphy and Structure	17
Structural Geology Near St. Charles	20
III. REVIEW OF THE THEORETICAL BACK- GROUND OF EARTH RESISTIVITY	23
Historical Development	23
Solution by Image Summations	39
Solution by Integral Equations	41
The Inverse Problem	47
Interpretation Procedures in Practice	48
Two Layer Case	49
Multi-layer Case	52
Empirical Method	53

Chapter	Page
IV. EQUIPMENT AND TECHNIQUE OF THE RESISTIVITY SUR- VEY	55
Primary Equipment	55
Working Principles	57
Secondary Equipment	61
Technique of the Survey	63
Horizontal Traverse	66
Resistivity Determinations	68
V. THE ANALYSIS	70
Methods of Interpretation Used	73
Plotting of the Field Data	75
Nature of the Field Data	76
Results of the Field Data	78
The Horizontal Traverse	79
Interpretation of the Curves	85
VI. CONCLUSIONS	91
Geophysical Conclusion	91
Geologic Conclusion	93
General Conclusions	94
BIBLIOGRAPHY	95
VITA AUCTORIS	101