

RECLAMATION

Managing Water in the West

Updated Parker-Davis Project Transmission System Cost Allocation Report for Replacements and Additions

**Parker-Davis Project
Lower Colorado Region**



Mission Statements

The Department of the Interior conserves and manages the Nation's natural resources and cultural heritage for the benefit and enjoyment of the American people, provides scientific and other information about natural resources and natural hazards to address societal challenges and create opportunities for the American people, and honors the Nation's trust responsibilities or special commitments to American Indians, Alaska Natives, and affiliated island communities to help them prosper.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

Approval

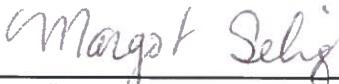
Updated Parker-Davis Project Transmission System Updated Cost Allocation Report for Replacements and Additions

**Lower Colorado Regional Office
Boulder Canyon Operations Office
Lower Colorado Region Power Office
Boulder City, Nevada**

This cost allocation report and its Appendix A, dated July 22, 2019, are hereby approved.



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Procedure for Allocating Costs of Parker-Davis Project Transmission System Replacements or Additions

Purpose

This document sets forth a procedure for the Bureau of Reclamation to follow in allocating the costs of new or replacement Parker-Davis Project (P-DP) transmission system features, which carry out the project's congressionally authorized purposes by jointly serving irrigation (priority) and other power beneficiaries within the Lower Colorado Region. Cost allocation is the first step in eventual repayment of the costs of a new or replacement feature by its beneficiaries. The P-DP cost allocation, last revised in 1962, does not contemplate increases in capacity resulting from the replacement or addition of features; therefore, this complementary addendum to the cost allocation is necessary to ensure that costs of new or replacement project features are properly allocated between interest-bearing and non-interest-bearing sub-purposes. No original project costs will be reallocated in this process.

Background

Project History

Construction of Parker Dam was authorized by the Rivers and Harbors Act of August 30, 1935 (49 Stat. 1028), which also ratified the Secretary of the Interior's February 10, 1933, contract with The Metropolitan Water District of Southern California (MWD). Under the contract, MWD provided funding for construction and operation of the dam by the United States, which retained title to the facilities as well as one half of the power privilege thereof. Construction of the dam was substantially complete by September 1938. The act of May 2, 1939 (53 Stat. 685), provided appropriations, to be repaid from net power revenues, for construction of the Parker Dam Power Project which included a power plant, transmission lines, substations, and appurtenant works. Power generation at the dam began on December 13, 1942, although the transfer of many substations from construction to operation and maintenance (O&M) status did not occur until 1952, when the project was considered complete.

Construction of Davis Dam and its powerplant was authorized under the provisions of the Reclamation Project Act of 1939 (53 Stat. 1187) when the Secretary of the Interior made a determination of feasibility on April 26, 1941. The United States' involvement in World War II delayed the official initiation of

construction until 1946, and the project was not declared complete until 1952. During construction, prior to the formal consolidation of the Parker Dam Power and Davis Dam Projects, the proximity of the structures and their shared power purpose enabled Reclamation to share resources between the two facilities. In 1948, administration of the Davis Dam Project transmission line and substation construction activities was transferred to the Parker Dam Power Project, and on December 31, 1950, a 230-kV transmission line was energized between Parker and Davis Dams. The Parker-Davis Project was formed by the Act of May 28, 1954 (68 Stat. 143), which consolidated the Parker Dam Power and Davis Dam Projects.

The consolidated project provides hydroelectric power to commercial customers and Reclamation projects in Arizona, California, and Nevada through a 1,600-mile long network of interconnected transmission lines, divided into sections by more than 30 substations. Power for Gila and Yuma Project use is contracted to Unit “B” Irrigation and Drainage District, Yuma County Water Users’ Association, Yuma Irrigation District, Yuma Mesa Irrigation and Drainage District, and Wellton-Mohawk Irrigation and Drainage District. This project use power is reserved for meeting the electrical service requirements of the project purposes authorized by Congress, including (but not limited to) irrigation pumping and the operation of government facilities.

Expansion of the P-DP transmission system occurred in 1962, when construction supervision of the southern portion of the Colorado River Storage Project transmission system was transferred from Reclamation’s Upper Colorado Region. In 1963 the P-DP transmission system was interconnected with the Salt River Project, and in 1966 it became part of the Pacific Northwest-Pacific Southwest Intertie System. The Parker-Davis Project office administered construction and O&M activities of the transmission system until passage of the Department of Energy Organization Act (DOE Act) (91 Stat. 565) on August 4, 1977.

Legal Authority for the Proposed Actions

The DOE Act created the Western Area Power Administration (WAPA) and transferred Reclamation’s functions with respect to power marketing, including the construction, operation, and maintenance of transmission lines and attendant facilities, to the Secretary of Energy.

Reclamation retains all other functions not transferred, including the allocation of costs among project purposes and sub-purposes; see the Act of June 17, 1902 (32 Stat. 388, Section 4) (Reclamation Act), and the Reclamation Project Act of 1939 (53 Stat. 1187, Section 9(a)) (August 4, 1939). Section 4.N.(2) of the Reclamation Manual Delegations of Authority, dated May 28, 2019, defines the authority of Reclamation offices to conduct project cost allocations as follows:

The regional directors are delegated the authority. . . to conduct feasibility studies, prepare reports, declare a project complete, and conduct final project construction cost allocations upon project

completion as specifically authorized by Congress (255 DM 1.1.A.).

The P-DP cost allocation was approved by the Commissioner of Reclamation in 1962 in accordance with authority retained by him. Reclamation's Director, Policy and Administration, and Senior Advisor - Hydropower have concurred that this update to the sub-allocation fits within the framework approved by the Commissioner while responding appropriately to changes in the project because it does not change the allocation of joint costs, reallocate historical costs, or constitute a change in methodology. This concurrence concluded that the Regional Director's delegated authority is not abrogated by the Commissioner's 1962 approval of the overall cost allocation, and that the cost sub-allocation update does not require approval by the Commissioner.

Agency Actions

In accordance with their respective authorities, WAPA is undertaking the replacement of aging features of the P-DP transmission system, and Reclamation is allocating the costs of those replacement features to the irrigation and power sub-purposes.

Technical Information

Definitions

Cost allocation is the process of assigning to each function in a multiple-purpose project an equitable share of the total cost. It is accomplished through a prescribed series of steps known as a **method**. In the 1962 P-DP cost allocation, Reclamation allocated overall P-DP costs using two allocation methods, Separable Costs-Remaining Benefits (SCRB) and Use of Facilities.

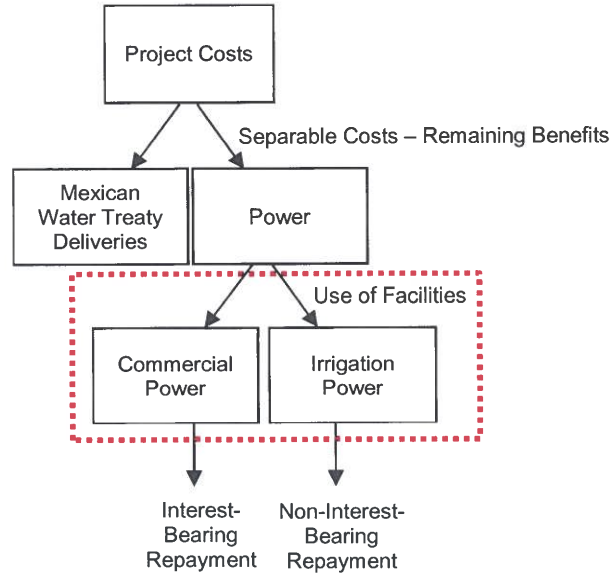
Cost allocation also refers to the body of documents that form the physical documentation of the aforementioned process.

Purposes are derived from general Reclamation law or project-specific authorizing legislation, and commonly include water supply, flood control, power, recreation, and fish & wildlife. As a project purpose to which costs will be allocated, **irrigation** encompasses all features and investments necessary to realize the commercial agricultural benefits intended by Congress in the authorization of a project, and to provide for the project as a going concern.

Project purposes may be combined in the first step of a cost allocation if their uses of a common facility are intermingled; they are separated as **sub-purposes** in a second phase of the cost allocation, referred to as a **sub-allocation**. For example, project costs allocated to water supply may be sub-allocated to irrigation and municipal & industrial use. In the P-DP, project costs allocated to power are further sub-allocated to both irrigation and power.

Structure of the 1962 Cost Allocation

The structure of the 1962 project cost allocation is illustrated below. This procedure document is applicable only to the sub-allocation shown outlined in red, and excludes single-purpose features serving only non-irrigation beneficiaries.



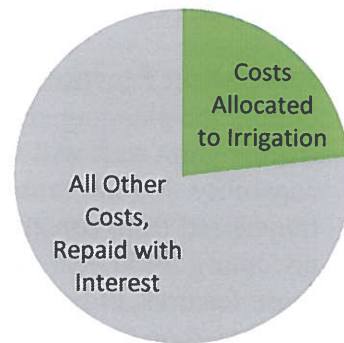
Use of Facilities Method of Cost Allocation

The Use of Facilities method chosen by Reclamation for this sub-allocation was described in an office memorandum from the Regional Power Engineer to the Regional Director of the Lower Colorado Region, dated August 24, 1954, entitled *Electric Plant Investment Allocated to Irrigation – Parker-Davis Project*. The method is appropriate for sub-allocations where different types of beneficiaries are engaged in a common purpose, such as municipal water users and irrigators sharing a canal. Costs are assigned proportionate to the use of joint facilities by each purpose, which must be susceptible of measurement on a comparable basis.

Capacity was chosen as the measure of proportional use in the initial sub-allocation, likely for its equity and relative ease of estimation; the capacity use formula is discussed further in the following section. Since the performance of the initial sub-allocation, however, Reclamation and WAPA have gained operational experience and have entered into additional contracts with irrigation beneficiaries to clarify their use of P-DP Priority Use Power and their participation in its management (for an overview, see *Agreement in Principle for Parker-Davis Project Priority Use Power*; June 24, 1996; 96-DSR-10714/6-CU-30-P1135 (terminated)). It is no longer necessary, as it was in 1954, for the sub-allocation to account for pumping loads and losses in order to estimate the capacity used by irrigation. That capacity is agreed upon in *Amendment No. 1 to the Operating Contract for Parker-Davis Project Priority Use Power*; May 27, 2005; 96-DSR-10715/6-CU-30-P1138 (PUP Operating Contract), as the sum of the summer season Aggregate Contract Rates of Delivery (ACROD) in Exhibits A-1 and A-2.

Financial accounting, rate setting, and individual contracts determine who bears the cost of losses. Section 9.8.1 of the PUP Operating Contract states, “Western is responsible for Losses incurred to deliver P-DP Priority Use Power up to each [Aggregate Power Manager’s] seasonal ACROD to Point(s) of Use for Priority Use Load....” Consistent with that provision and common economics practice, this sub-allocation reflects each feature’s potential to perform work, as constructed for ultimate use. Capacity is the accumulated stock of investments in infrastructure; it is not lost in the conveyance of water or energy, but through insufficient ongoing investment in its productivity. Quantification of capacity, however, must account for operational conditions which increase or decrease the usable capacity of a feature relative to its nominal rating. Just as project purposes must share a common measure of use, reserved capacity can only be compared with capacity that is capable of being reserved.

Because there are only two purposes in this sub-allocation, all costs not allocated to irrigation are thereby allocated to power (see illustration on right); it is not necessary to associate a quantity of capacity with purposes other than irrigation.



Capacity Use Formula

The mathematical tool of this sub-allocation is the capacity use formula:

$$\frac{\text{Priority Use Power Summer ACROD}}{\text{Total Transfer Capability}} = \text{Capacity Use by Irrigation}$$

The formula’s numerator is capacity withdrawn for irrigation, while the denominator is operational capacity of a project feature; the resulting quotient is multiplied by the total cost of the feature, and that product is the cost allocated to irrigation. Reclamation’s allocation provides the quotient only; costs related to P-DP transmission features are expended by WAPA and are within its purview for purposes of this allocation.

The following sections describe how Reclamation 1) has developed allocations of prospective costs for features already in service, 2) is planning allocations for future replacements or additions, and 3) is documenting those allocations.

Allocation Procedures

Allocation Formulas for Features in Service

Some features whose costs were last allocated in 1962 have already been replaced and are currently operating at a higher capacity; additionally, capacity use by irrigation has increased for all features pursuant to the PUP Operating Contract. Reclamation has prepared and documented allocations for each feature to reflect

this current state of the project; see Appendix A. Thereafter, as costs associated with these features are recorded in WAPA's financial system, these allocations will be used to determine the non-interest-bearing portion of the repayment of those costs.

Unlike the 1962 project cost allocation, which aggregated similar features based on capacity, Appendix A generally identifies individual transmission line segments and substations as the system's major features. This approximates the level of detail at which data can be gathered and reported, replacements or upgrades are installed, and capacity is planned based on current and future needs. The list of major features derives its structure and numbering from the 1962 project cost allocation, but has been expanded to support allocations at the level of detail that best reflects operation of the system.

Allocation Formulas for Upcoming Replacements or Additions

During the planning and construction processes for new or replacement features, Reclamation staff will work with staff at WAPA to estimate future transfer capability. To the extent that new or replacement features are expected to be transferred from construction work in progress to plant in service during the upcoming fiscal year, Reclamation will prepare an allocation of costs for each of those features, utilizing the best available data, prior to the beginning of the next fiscal year on October 1 (which will be considered the effective date). This will be documented in the form of a revised Appendix A, which shall not be considered final until approved by the Regional Director and transmitted by letter from Reclamation's Lower Colorado Region to WAPA's Desert Southwest Region.

Allocations will be performed and documented only for new or replacement features that:

- Serve irrigation purposes, and
- Have a different marketable capacity than the existing feature.

The process described above may also be triggered by a change in capacity use by irrigation, or a change in path ratings. Errors in allocation are subject to correction in the repayment and rate studies the year following discovery, although Reclamation and WAPA desire that cost allocation be an ongoing annual process. If no updates have been performed over a 5-year period, Reclamation staff will work with staff at WAPA to perform a periodic review.

Documentation

Documenting the decisions made in a cost allocation is critical to its credibility, which reflects on the agencies involved. Responsible exercise of non-interest-bearing repayment of costs allocated to irrigation, as provided by Congress, has been a subject of inquiry by the United States Government Accountability Office, the Department of the Interior's Office of Inspector General, and international organizations including the World Trade Organization, to whom Reclamation reports biennially with an estimate of foregone interest. Therefore, Reclamation

must ensure that constructed capacity is properly documented for each feature whose costs will be allocated. Because operating documents are sensitive, Reclamation does not intend to attach them to allocations, but the allocation must reference the data source for future inquiry.

Repayment

Repayment of costs allocated to irrigation through this process will occur through existing contracts unless other arrangements are made. Regardless of which project beneficiaries repay these costs, they are repaid without interest.

Appendix A - Allocation Formulas by Feature

July 22, 2019

(1a) Davis Dam Power Allocation

$$\frac{40,500 \text{ kW}^1}{255,000 \text{ kW}^2} = 15.9\% \text{ of costs will be allocated to irrigation}$$

(1b) Davis Dam Switchyard and related equipment

$$\frac{40,500 \text{ kW}}{415,000 \text{ kW}^3} = 9.8\% \text{ of costs will be allocated to irrigation}$$

(2a) Davis-Topock Line

$$\frac{40,500 \text{ kW}}{415,000 \text{ kW}^4} = 9.8\% \text{ of costs will be allocated to irrigation}$$

(2b) Topock-Parker Line

$$\frac{40,500 \text{ kW}}{615,000 \text{ kW}^5} = 6.6\% \text{ of costs will be allocated to irrigation}$$

(2c) Parker 230-kv Switchyard and related equipment

$$\frac{40,500 \text{ kW}}{615,000 \text{ kW}^6} = 6.6\% \text{ of costs will be allocated to irrigation}$$

¹ 40,500 kW in the numerator always refers to the sum of the summer season Aggregate Contract Rates of Delivery (ACROD) in Exhibits A-1 and A-2 of *Amendment No. 1 to the Operating Contract for Parker-Davis Project Priority Use Power*; May 27, 2005; 96-DSR-10715/6-CU-30-P1138

² Form PO&M-59, Monthly Report of Power Operations- Powerplants (Davis); Installed Capacity

³ Review of Western-DSW TTC and Transfer Capability Values, dated November 25, 2014 (TTC Report), as DAVIS230-TOPOCK230, the line leaving the switchyard

⁴ TTC Report, as DAVIS230-TOPOCK230

⁵ TTC Report, as TOPOCK230-PARKER230

⁶ TTC Report, as TOPOCK230-PARKER230, the line entering the switchyard

(3) Parker 161-kv Switchyard and related equipment

$$\frac{40,500 \text{ kW}}{167,000 \text{ kW}^7} = 24.3\% \text{ of costs will be allocated to irrigation}$$

(4a1) Parker-Bouse Line

$$\frac{40,500 \text{ kW}}{167,000 \text{ kW}^8} = 24.3\% \text{ of costs will be allocated to irrigation}$$

(4a2) Bouse-Kofa Line

$$\frac{40,500 \text{ kW}}{167,000 \text{ kW}} = 24.3\% \text{ of costs will be allocated to irrigation}$$

(4a3) Kofa-Dome Line

$$\frac{40,500 \text{ kW}}{167,000 \text{ kW}} = 24.3\% \text{ of costs will be allocated to irrigation}$$

(4a4) Dome-Gila Line

$$\frac{40,500 \text{ kW}}{167,000 \text{ kW}} = 24.3\% \text{ of costs will be allocated to irrigation}$$

(4a5) Dome-Wellton Line

$$\frac{22,400 \text{ kW}^9}{167,000 \text{ kW}^{10}} = 13.4\% \text{ of costs will be allocated to irrigation}$$

(4b1) Parker-Blythe Line

$$\frac{40,500 \text{ kW}}{279,000 \text{ kW}^{11}} = 14.5\% \text{ of costs will be allocated to irrigation}$$

⁷ TTC Report, as PARKER230-GILA161, the line leaving the switchyard

⁸ TTC Report, as PARKER230-GILA161; currently covers equations 4a1 through 4a4

⁹ Wellton-Mohawk Irrigation and Drainage District reserved load minus APM responsibility (35,900 kW – 13,500 kW) as shown in Exhibit A-1 to Contract No. 6-CU-30-P1138

¹⁰ Personal communication from WAPA's Transmission Planning Group on August 13, 2015, "Spreadsheet Ratings for BOR P-D Rates Allocation 8-15" (Ratings Spreadsheet); on file with Mrs. Lesli Kirsch-Burke

¹¹ TTC Report, as PARKER230-BLYTHE161

(4b2) Blythe-Knob Line

$$\frac{40,500 \text{ kW}}{167,000 \text{ kW}^{12}} = 24.3\% \text{ of costs will be allocated to irrigation}$$

(4b3) Knob-Gila Line

$$\frac{40,500 \text{ kW}}{112,000 \text{ kW}^{13}} = 36.2\% \text{ of costs will be allocated to irrigation}$$

(5a) Gila 161-kv Substation and related equipment

$$\frac{40,500 \text{ kW}}{167,000 \text{ kW}^{14}} = 24.3\% \text{ of costs will be allocated to irrigation}$$

(5b) Gila 34.5-kv Substation and related equipment

$$\frac{4,600 \text{ kW}^{15}}{9,000 \text{ kW}^{16}} = 51.1\% \text{ of costs will be allocated to irrigation}$$

(5c) Gila 4.16-kv Line to YMIDD Pumping Plant and related equipment

$$\frac{4,000 \text{ kW}^{17}}{12,000 \text{ kW}^{18}} = 33.3\% \text{ of costs will be allocated to irrigation}$$

(6a) Gila-Wellton-Mohawk Line

$$\frac{22,400 \text{ kW}}{153,000 \text{ kW}^{19}} = 14.6\% \text{ of costs will be allocated to irrigation}$$

¹² TTC Report, as BLYTHE161-KNOB161

¹³ TTC Report, as KNOB161-GILA161

¹⁴ TTC Report, as PARKER230-GILA161, the line entering the substation

¹⁵ The Yuma County Water Users' Association APM allocation as shown in Exhibit A-2 to Contract No. 6-CU-30-P1138

¹⁶ Ratings Spreadsheet

¹⁷ 40 FR 15101, dated April 4, 1975, *Notice of Proposed Reallocation of Power*

¹⁸ Personal communication with WAPA's Power Systems Operations Group on July 16, 2016 (Kim Clark)

¹⁹ Ratings Spreadsheet

(6b) Gila-Yuma Mesa Line

$$\frac{67 \text{ kW}^{20}}{9,000 \text{ kW}^{21}} = 0.74\% \text{ of costs will be allocated to irrigation}$$

(6c) Gila-Yuma Tap Line

$$\frac{4,600 \text{ kW}^{22}}{9,000 \text{ kW}^{23}} = 51.1\% \text{ of costs will be allocated to irrigation}$$

(7) Wellton-Mohawk Features Associated with Parker-Davis Project Use

100% of costs will be allocated to irrigation

²⁰ Contract No. 6-CU-30-P1136, Exhibit B-2, Revision 10 as YMO58 Irrigation Relift Pumps

²¹ Ratings Spreadsheet

²² The Yuma County Water Users' Association APM allocation as shown in Exhibit A-2, Revision 4, to Contract No. 6-CU-30-P1138

²³ Ratings Spreadsheet

