Western Interconnection Regional Advisory Body

2020 Business Plan and Budget

April 29, 2019

Under Consideration by:
Appointed Members of the
Western Interconnection Regional Advisory Body

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Introduction

The Western Interconnection Regional Advisory Body (WIRAB) proposed budget for 2020 is $1,255,200. This amount is $92,500 (8.0%) higher than the amount in WIRAB's approved budget for 2019. Total proposed FTEs for 2020 remain constant at 5.0. WIRAB's total funding requirement is $986,900. WIRAB's proposed funding assessment is $986,300, an increase of $236,300 (31.5%) from the 2019 funding assessment. WIRAB's proposed funding assessment is allocated $825,632 (84%) to the U.S. portion, $145,381 (15%) to the Canadian portion, and $15,288 (1%) to the Mexican portion of the Western Interconnection. The following table summarizes the WIRAB proposed budget for 2020.

WIRAB - Total Resources (in whole dollars)	2020 Budget	U.S.	Canada	Mexico
Statutory FTEs	5.00			
Non-statutory FTEs				
Total FTEs	5.00			
Statutory Expenses	$ 1,255,200			
Non-Statutory Expenses				
Total Expenses	$ 1,255,200			
Statutory Inc(Dec) in Fixed Assets				
Non-Statutory Inc(Dec) in Fixed Assets				
Total Inc(Dec) in Fixed Assets	$ -			
Statutory Working Capital Requirement	$ (268,300)			
Non-Statutory Working Capital Requirement	0			
Total Working Capital Requirement	$ (268,300)			
Total Statutory Funding Requirement	$ 986,900			
Total Non-Statutory Funding Requirement	$ -			
Total Funding Requirement	$ 986,900			
Statutory Funding Assessments	$ 986,300	$ 825,632	$ 145,381	$ 15,288
Non-Statutory Fees				
NEL	855,560,204	716,187,032	126,140,685	13,232,487
NEL%	100.00%	83.71%	14.74%	1.55%

Table 1. WIRAB Budget for 2020

Organizational Overview

In April 2006, ten Western Governors petitioned the Federal Energy Regulatory Commission (FERC or Commission) to create the Western Interconnection Regional Advisory Body (WIRAB) under Section 215(j) of the Federal Power Act. The Governors indicated an interest in inviting all U.S. states, Canadian provinces, and Mexican jurisdictions with territory in the Western Interconnection to join WIRAB and to participate in WIRAB's activities as a regional advisory body charged with advising FERC, the North American Electric Reliability Corporation (NERC) and the Regional Entity (i.e., WECC) on electric grid reliability matters.

In July 2006, FERC issued an order granting the Governors' petition to establish WIRAB.[1] In FERC's order, the Commission determined that WIRAB should receive funding for its Section 215(j) activities and directed WIRAB to annually develop a budget and related information for submission through the Electric Reliability Organization (ERO) budget approval process. The Commission instructed WIRAB to develop a budget in a form similar to that specified for regional entities as set forth in Order 672.[2] The Commission also required WIRAB to identify the portion of its funding to be received from Canada and Mexico.

The Governors created WIRAB as a standing advisory committee to the Western Interstate Nuclear Board (WINB), which was formed pursuant to the Western Interstate Nuclear Compact, P.L. 91-461. WIRAB has the same status under the compact as the Western Interstate Energy Board (WIEB). Below is a chart that illustrates these organizational relationships.

[1] Order on Petition to Establish a Regional Advisory Body for the Western Interconnection, 116 FERC ¶ 61,061, Docket No. RR06-2-000, July 20, 2006.

[2] Rules Concerning Certification of the Electric Reliability Organization; and Procedures for the Establishment, Approval, and Enforcement of Reliability Standards, Order 672, Docket RM05-30-000, Feb. 3, 2006, P. 228. "Each Regional Entity must submit its complete business plan, entire budget and organizational chart to the ERO for it to submit to the Commission. The complete business plan and the entire budget will provide the Commission with necessary information about any non-statutory activities, the source of their funding, and whether the pursuit of such activities presents a conflict of interest for the Regional Entity. For a Cross-Border Regional Entity, this information will also inform the Commission as to what portion of the budget is expended upon activities within the United States."

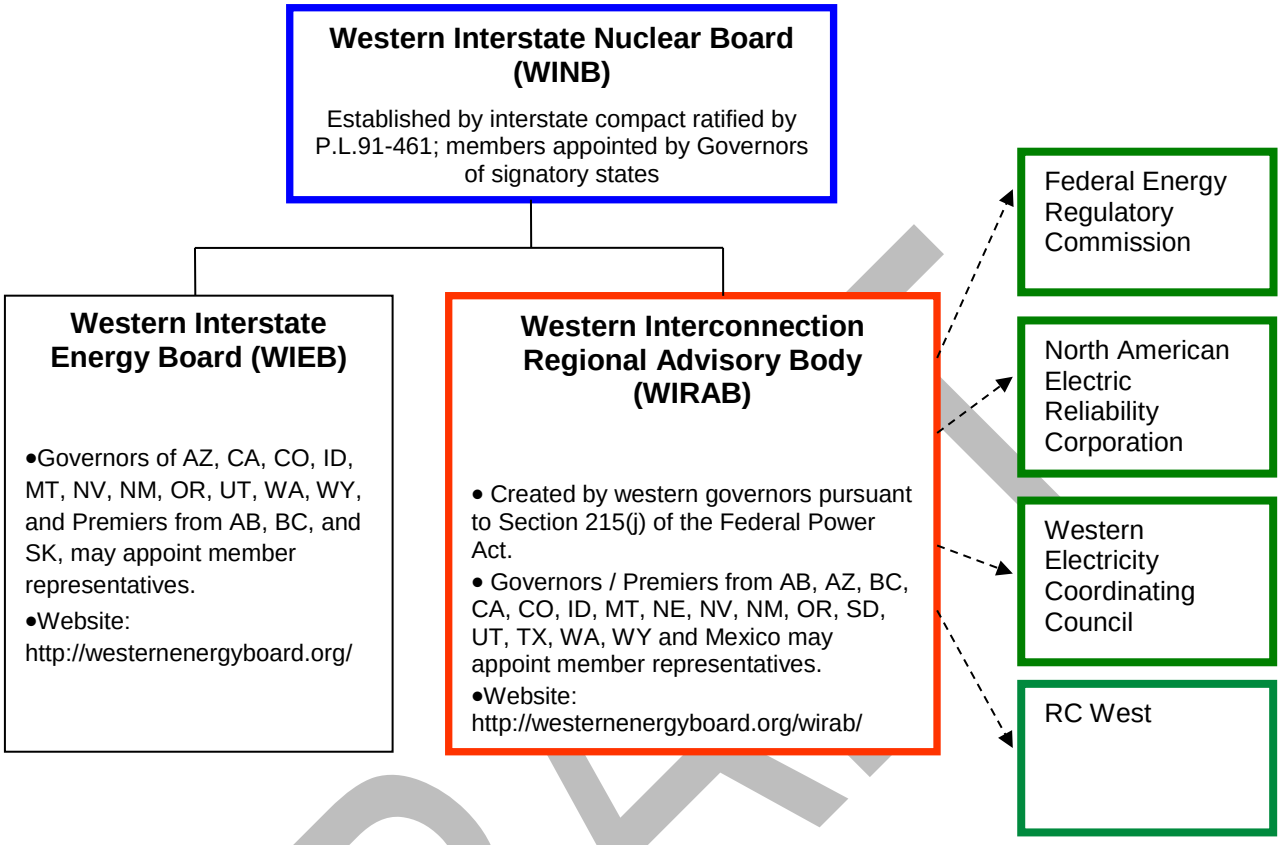

Figure 1. Organizational Relationships

Membership and Governance

All states with territory in the Western Interconnection (AZ, CA, CO, ID, MT, NE, NV, NM, OR, SD, TX, UT, WA, WY), the Canadian provinces of Alberta, British Columbia, and Saskatchewan, and Mexico are eligible to appoint members to WIRAB. Member representatives of WIRAB are appointees of the Governors and Premiers, or representative-designated alternates. Below is the list of current WIRAB member representatives:

WIRAB Member Representatives		
Alberta	Christine Lazaruk	Executive Director, Strategy and Integration, Alberta Energy
Arizona	Brian Goretzki	Chief, Bureau of Radiation Control, Arizona Department of Health Services
British Columbia	Les MacLaren	Assistant Deputy Minister, Ministry of Energy, Mines and Petroleum Resources
California	Janea Scott	Commissioner, California Energy Commission
Colorado	Frances Koncilja	Commissioner, Colorado Public Utilities Commission
Idaho	Kristine Raper	Commissioner, Idaho Public Utilities Commission
Montana	Dan Lloyd	Section Supervisor, Montana Department of Environmental Quality
Nebraska	Tim Texel	Executive Director, Nebraska Power Review Board
Nevada	David Bobzien	Director, Nevada Governor's Office of Energy
New Mexico	Sarah Cottrell Propst	Cabinet Secretary, New Mexico Energy, Minerals and Natural Resources Department
Oregon	Janine Benner	Director, Oregon Department of Energy
South Dakota	Greg Rislov	Commission Advisor, South Dakota Public Utility Commission
Utah	David Clark	Commissioner, Utah Public Service Commission
Washington	Elizabeth Osborne	Senior Energy Policy Analyst, Washington State Energy Office
Wyoming	Kara Fornstrom	Chair, Wyoming Public Service Commission

Figure 2. WIRAB Membership List

WIRAB holds two in-person meetings each year, typically in April and October. These meetings are open to the public. WIRAB also holds monthly conference calls to discuss current and emerging issues and hosts periodic webinars with presentations from subject matter experts on key electric grid reliability topics.

Statutory Functional Scope

FERC established WIRAB as a Regional Advisory Body under section 215(j) of the Federal Power Act. The language in Section 215(j) specifically provides for WIRAB's authority to advise FERC, NERC, and WECC on whether reliability standards, budgets and fees, governance, compliance, assessments, strategic direction and other activities conducted pursuant to Section 215 are just, reasonable, not unduly discriminatory or preferential, and in the public interest.

WIRAB's advice to FERC, NERC, and WECC can be grouped into four categories that are appropriately funded under Section 215 of the FPA, including:

1. Governance and Strategic Planning;

2. Emerging Trends and System Risks;
3. Periodic Reliability Assessments; and
4. Reliability Standards and Proactive Enforcement.

WIRAB's activities in each of these categories are described in Section A – Statutory Activities.

2020 Strategic Priorities and Initiatives

The resource mix of the Western power system is rapidly changing. Environmental regulations (including those to reduce regional haze and mercury emissions), efforts to transition to a lower carbon economy, and shifting market forces have resulted in announced retirements of coal-fired and nuclear generating units. Utility-scale wind and solar generation is being built in many parts of the West, and California and the Desert Southwest are experiencing rapid growth in the installation of distributed solar photovoltaic generation. State energy storage procurement mandates are also incentivizing a broader implementation of energy storage technologies that may support higher penetrations of asynchronous, variable energy resources (VER). These changes to the generation resource mix will present new reliability challenges and opportunities for the Western Interconnection as more asynchronous generation is added to the system and additional synchronous spinning mass generation is retired.

Grid modernization efforts also present new reliability challenges and opportunities for the West. Efforts to increase electrification of energy end uses, such as transportation and space and water heating, and increased reliance on distributed energy resources (DER) is creating a need for better coordination between Bulk Electric System (BES) operators and distribution system operators and a greater need for implementation, research, and development of new technologies and operational tools that can be used to improve system reliability throughout the West. Grid modernization also necessitates an increasing focus on cyber security, grid resilience, and physical hardening of electric grid infrastructure. Physical and cyber threats to the grid will continue to impact the availability of data and the transparency of periodic reliability assessments, creating a need for better data sharing protocols to improve information sharing, coordination, and overall situational awareness.

The structure of Western power markets is also undergoing significant change, creating new reliability challenges and opportunities for the Western Interconnection. The California Independent System Operator (ISO) Western Energy Imbalance Market (EIM) continues to gain new participants and the California ISO is working to offer day ahead market services to EIM participants. The Southwest Power Pool (SPP) is also offering market services to BAs and TOPs within the Western Interconnection. Finally, Alberta is expanding its energy-only market to an energy and capacity market. These market reforms could result in significant changes to system operations (e.g., transmission scheduling, congestion management, and reliability coordination).

The fragmentation of Reliability Coordinator (RC) responsibilities across the Western Interconnection also raises questions about ongoing reliable operations of the BES. In 2020, Peak Reliability will no longer provide RC services for the Western Interconnection. The Alberta Electric System Operator will continue to provide RC services to Balancing Authorities (BAs) and Transmission Operators (TOPs) in Alberta, BC Hydro will provide RC services to BAs and TOPs in British Columbia, and the California ISO and SPP will provide RC services to BAs and TOPs throughout the U.S. portion of the Western Interconnection. These changes raise concerns about shared responsibilities for coordinated RC operations across RC boundaries and seams.

In response to these on-going changes in the Western Interconnection, WIRAB has identified four strategic initiatives that it will pursue in 2020:

Initiative 1: Encourage WECC to improve its assessment of resource adequacy to ensure that state and provincial policymakers, FERC, and NERC have access to accurate, consistent and timely information on capacity expansion in the West.

Analysis of long-term resource adequacy in the West addresses the question of whether the power system will have sufficient generation resources available to meet future loads. Oversight and regulation of resource adequacy is the responsibility of states and provinces in North America. In the Western Interconnection, determinations of resource adequacy are primarily the responsibility of the regulatory commissions of 14 western states and two Canadian provinces.

However, a rise in short-term market purchases and "front-office transactions" (FOTs) has made it increasingly difficult to determine future resource adequacy. FOTs are confidential market transactions that utilities may rely upon to meet load, but which regulators and other entities cannot trace to a specific physical generator. By relying on FOTs, utilities can avoid increasing capacity within their territory, and utility customers can avoid costs associated with investments in new generating resources. However, if sufficient future surplus capacity is not available, utilities relying on FOTs risk not having sufficient capacity available to serve load, which is a risk to reliability. Conversely, significant overbuilding of generation capacity could result in increased costs to customers and stranded assets. A lack of information is a fundamental problem for the current practice of resource adequacy planning and oversight.

Regulators and policymakers need access to accurate, consistent and timely information on capacity expansion throughout the West. The U.S. Government Accountability Office has pointed to a lack of data on capacity commitments as a barrier to ensure resource adequacy in regions without capacity markets.[3] NERC's Long-Term Reliability Assessment provides a very high-level overview of long-term resource adequacy, but does not provide much value to regulators and policymakers who require more granular information regarding their region.

In 2020, WIRAB will encourage WECC to work with NERC to improve how the Region reviews data from data providers on future resource scenarios that meet current policy targets and assess the adequacy of the system under a changed resource mix.

The goals of this initiative are to:

- Improve the data quality and analysis in NERC's Long-Term Reliability Assessment for the Western Interconnection, including the western Canadian provinces
- Share more granular information on long-term resource adequacy analysis of the Western Interconnection.

[3] GAO. *Electricity Markets: Four Regions Use Capacity Markets to Help Ensure Adequate Resources, but FERC Has Not Fully Assessed Their Performance.* GAO-18-131. (December 2017). https://www.gao.gov/assets/690/689293.pdf

- Develop a capacity tracking mechanism to demonstrate resource adequacy within regions of the Western Interconnection.

The actions that WIRAB staff will take to achieve these goals include:

- Participating directly in the WECC Reliability Assessment Committee (RAC) to provide the foundation for the development of the integrated data set and analytical tools needed to conduct comprehensive reliability assessments of the Western Interconnection and the availability of essential reliability services under a wide range of future scenarios.
- Advising WECC to work with resource planners to review data for quality assurance before including the data into reliability assessments.
- Encouraging WECC to conduct reliability assessments of RA related issues associated with increased reliance on Variable Resources.
- Continuing discussions with regulators and policymakers in the West about what information they need to determine resource adequacy in their jurisdiction.
- Working to find a partner to set up a clearinghouse to track physical capacity and ensure that there is sufficient dispatchable built generation to meet regional resource adequacy requirements.

Initiative 2: Encourage WECC to study and publish findings on the interrelationship between distributed energy resources and the reliability of the Bulk-Power System in the West.

Recent events in the West have demonstrated the impacts of distributed energy resources on the Bulk-Power System (BPS). During the 2018 Angeles Forest and Palmdale Roost disturbance events in Southern California, the California Independent System Operator (CAISO) witnessed a noticeable increase in net load following faults on the BPS, indicating that a disturbance on the BPS can affect distributed resources behind the customer meters.[4] Research conducted by the National Renewable Energy

[4] NERC and WECC Staff. *April and May 2018 Fault Induced Solar Photovoltaic Resource Interruption Disturbances Report.* (January 2019).

Laboratory (NREL) modeled this phenomenon in a round-trip study between the BPS to the distribution system and back to the BPS, and the research found that transmission-level faults may cause adverse voltages at the inverters connecting distributed energy resources to the grid, which may cause the resources to trip offline, further impacting the BPS.[5]

Generation is becoming more distributed. Like distributed solar photovoltaics (PV), the cost of battery technology is enabling electric vehicles and behind-the-meter storage to be adopted at an ever-increasing rate. The distribution system is becoming bi-directional, and BPS planners cannot sit back and assume that distribution-level analysis will interact with the BPS in a well-defined and predictable manner. The amount of data and computing power necessary to analyze the interrelationship of the distribution system and BPS requires a shift away from precision to prioritizing what insights models can provide.

In 2020, WIRAB will encourage WECC to study and publish findings on the interrelationship between distributed energy resources, including solar PV, behind-the-meter storage, and electric vehicles, and the reliability of the Bulk-Power System in the West.

The goals of this initiative are to:

- Inform the WECC Reliability Assessment Committee of modeling techniques used by NREL to conduct its assessment of reliability concerns associated with distributed solar PV systems.
- Expand modeling techniques to assess reliability implications associated with other distributed energy resources including battery storage and electric vehicles.
- Disseminate findings on the interrelationship between distributed energy resources and the BPS to industry, regulators, policymakers, and stakeholders in the West.

https://www.nerc.com/pa/rrm/ea/April_May_2018_Fault_Induced_Solar_PV_Resource_Int/April_May_2018_Solar_PV_Disturbance_Report.pdf

[5] Citation Needed – Report still in draft form.

- Improve the understanding around distributed energy resources and the impacts they have on the operational and planning performance at the BPS.

The actions that WIRAB staff will take to achieve these goals include:

- Working with WECC's Reliability Assessment Committee to conduct round trip analysis between the BPS and distribution system to determine scenarios where there is a significant risk to regional and interconnection-wide reliability.
- Helping WECC identify the type and periodicity of information needed from distributed energy resources to ensure the aggregate technical specification of generation connected to local distribution grids are know to planners and operators.
- Monitoring and reviewing the changes to address the potential gaps and clarification necessary in PRC-024-2: *Generator Frequency and Voltage Protection Relay Settings.*[6]
- Monitoring and participating in NERC's Inverter-Based Resource Performance Task Force.
- Monitoring and participating in the NERC System Planning Impacts from Distributed Energy Resources Working Group.

Initiative 3: Encourage western Reliability Coordinators to adopt a set of consistent metrics to measure performance, to identify best practices, and to strive for exceptional reliability in the West.

By 2020, the West will have transitioned the Reliability Coordinator (RC) function from Peak Reliability to as many as four entities providing the RC function within the same footprint. Peak's RC area encompassed most of the Western Interconnection and Peak had the ability to monitor the system interconnection-wide. With the shift to

[6] NERC Inverter-Based Resource Performance Task Force. *PRC-024-2 Gaps Whitepaper*. NERC (Fev. 2019). https://www.nerc.com/comm/PC/InverterBased%20Resource%20Performance%20Task%20Force%20IRPT/NERC_IRPTF_PRC-024-2_Gaps_Whitepaper_FINAL_CLEAN.pdf

additional RCs in the West, the concern is that situational awareness and reliability performance will deteriorate without further cooperation. The West has no easy way to monitor real-time operational execution, and the move to additional RCs will increase the complexity of the challenge.

Operational performance is not just a measure of how well the grid is performing on a day-to-day basis, but should also include how entities perform the RC function from a tool and human performance perspective. The West may benefit from continually tracking and reviewing RC performance, to compare how entities are executing their RC activities and to demonstrate that the transition to additional RCs in the West has not led to a deterioration of reliability and service.

In 2020, WIRAB will encourage western RCs to strive to adopt consistent metrics to measure performance, to identify best practices, and to strive for exceptional reliability and service in the West.

The goals of this initiative are to:

- Maintain or improve reliability in a new RC environment by encouraging RC providers through cooperation and coordination.
- Maintain high-quality and cost-effective RC services across the West.
- Identify best practices among RCs in the West to collectively improve situational awareness and reliability across the interconnection.
- Improve reliability coordination services above and beyond the minimum required by the Reliability Standards.

The actions that WIRAB staff will take to achieve these goals include:

- Working with the RC oversight and executive committees to encourage the RC's to work together to develop a coordinated set of performance metrics.
- Encouraging WECC to develop and improve real-time indicators of interconnection health.
- Monitoring and participating in RC-to-RC coordination meetings to ensure entities are working together to share best practices amongst one another.

- Working with WECC's Event Analysis program to identify potential power system events that produce unique lessons learned to be shared across the industry.

Initiative 4: Assist WECC in assessing the reliability benefits and risks associated with wholesale electricity market expansion in the West.

The California Independent System Operator (CAISO) continues to expand the participation in its Energy Imbalance market (EIM); expanding to include ten western states and British Columbia's PowerEx. The CAISO is also discussing the potential of extending day-ahead services to EIM participants in addition to exploring day-ahead enhancements to improve flexibility and the unit commitment process. Additionally, the Southwest Power Pool (SPP) announced it is considering developing an energy imbalance market to serve the Western Interconnection, and it called on utilities and other stakeholders to join in its design and implementation. Alberta's Electric System Operator (AESO) continues to expand the services within its market by moving from an energy-only market to an energy and capacity market.

In 2013, FERC staff released a whitepaper titled "Qualitative Assessment of Potential Reliability Benefits from a Western Energy Imbalance Market," which analyzed the reliability benefits of the then-proposed EIM.[7] Now, as the CAISO-EIM has been a success and continues to grow, and as further market expansion continues in the West, WECC's Market Interface Committee (MIC) began a project to qualitatively assess the potential reliability benefits and risks of the expanding wholesale markets.

Throughout 2020, WIRAB will assist WECC in assessing and disseminating findings of the reliability benefits and risks associated with wholesale electricity market expansion in the West in an effort to improve the understanding of markets and the impacts on reliability.

The goals of this initiative are to:

- Develop a report on the reliability benefits and risks of expanding wholesale markets in the West.

[7] FERC Staff. *Qualitative Assessment of Potential Reliability Benefits from a Western Energy Imbalance Market.* (February 2013). https://www.westerneim.com/Documents/QualitativeAssessment-PotentialReliabilityBenefits-WesternEnergyImbalanceMarket.pdf

- Disseminate findings to industry, regulators, policymakers, and stakeholders in the West.
- Improve the understanding around markets and the impacts wholesale markets have on operational performance and reliability.

The actions that WIRAB staff will take to achieve these goals include:

- Participating directly with the WECC MIC to conduct research and develop a report on the reliability benefits and risks of expanding wholesale markets in the West.
- Encouraging the WECC Board of Directors to discuss the findings of the report at an open Board meeting.
- Encouraging WECC to disseminate the findings to the industry and encourage follow-up assessments from stakeholder input.
- Assisting WECC to disseminate the findings at a WIRAB meeting and encourage feedback from regulators and policymakers in the West.

2020 Budget and Assessment Impacts

The WIRAB proposed budget for 2020 is $1,255,200. This amount is $92,500 (8.0%) higher than the amount in WIRAB's approved budget for 2019. Total proposed FTEs for 2020 are 5.0. WIRAB's total funding requirement is $986,900. WIRAB's proposed funding assessment is $986,300, an increase of $236,300 (31.3%) from the 2019 funding assessment.

Personnel and Indirect Expenses

Personnel expenses increase from $436,500 in the 2019 Budget to $478,300 (9.6%) in the 2020 Budget due to personnel changes and cost-of-living and merit-based salary increases. WIRAB uses a single rate method for indirect expenses. The indirect expenses include office expenses, medical and retirement expenses as well as holiday, vacation and sick leave for WIRAB staff. The indirect rate is a percent of direct staff time spent on WIRAB. The indirect rate increases from 101% of direct labor costs in the

2019 Budget to 111% in the 2020 Budget. The increase is due to increased expenses for office rent, medical insurance, employee retirement, and other office costs. Table 2 shows personnel and indirect expenses per FTE for the approved 2019 Budget and the proposed 2020 Budget.

WIRAB - Personnel and Indirect Expense Analysis 2019-2020					
STATUTORY					
	Budget 2019	Projection 2019	Budget 2020	Variance 2020 Budget v 2019 Budget	Variance %
Salary Expense	$ 436,500	$ 446,000	$ 478,300	$ 41,800	9.6%
FTEs	5.00	5.00	5.00	-	0.0%
Cost per FTE	$ 87,300	$ 89,200	$ 95,660	$ 8,360	9.6%
Indirect Rate	101.3%	105.0%	111.7%		
Indirect Expense	$ 442,200	$ 468,300	$ 534,100	$ 91,900	20.8%
FTEs	5.00	5.00	5.00	-	0.0%
Cost per FTE	$ 88,440	$ 93,660	$ 106,820	$ 18,380	20.8%

Table 2. Personnel and Indirect Expense Analysis, 2019-2020.

Meeting Expense

Meeting costs decrease by $27,900 to $52,900. WIRAB will hold two major in-person meetings per year that include participation by state/provincial agencies with electric power responsibilities in the Western Interconnection. Wherever feasible, WIRAB meetings will be coordinated with other meetings of the Western states and provinces. Webinars on topics of concern will continue to be utilized between meetings. WIRAB also conducts monthly conference calls to update members on current activities and to develop positions on reliability issues in the Western Interconnection. Conference call costs remain constant at $3,200.

Travel Expense

Travel costs decrease by $13,300 to $86,700. WIRAB member travel to biannual meetings and reliability conferences accounts for $30,200. WIRAB staff travel to attend

meetings of WIRAB, WECC and NERC accounts for $56,500. Hotel and travel costs are based on experience from the last year.

Consultants and Contracts

The budget includes $100,000, the same amount as budgeted for 2019, in contract funding for technical expertise on issues related to improved grid operating practices, reliability standards and compliance. This expertise will help WIRAB to prepare and provide technically-sound advice to be submitted to FERC, NERC, and WECC, as authorized under Section 215(j).

Budget Comparison

Table 3 shows the 2019 Budget and 2019 Projection compared to the 2020 Budget.

WIRAB - Statement of Activities and Change in Working Capital
2019 Budget & Projection, and 2020 Budget

STATUTORY

	2019 Budget	2019 Projection	Variance 2019 Projection v 2019 Budget Over(Under)	% Change	2020 Budget	Variance 2020 Budget v 2019 Budget Over(Under)	% Change
Funding							
WIRAB Funding							
Assessments	$ 750,000	$ 750,000	$ -	0.0%	$ 986,300	$ 236,300	31.5%
Penalty Sanctions	-	-	-		-	-	
Total WIRAB Funding	**$ 750,000**	**$ 750,000**	**$ -**	**0.0%**	**$ 986,300**	**$ 236,300**	**31.5%**
Membership Dues	-	-	-		-	-	
Testing Fees	-	-	-		-	-	
Services & Software	-	-	-		-	-	
Workshops	-	-	-		-	-	
Interest	600	600	$ -	0.0%	600	$ -	0.0%
Miscellaneous	-	-	-		-	-	
Total Funding (A)	**$ 750,600**	**$ 750,600**	**$ -**	**0.0%**	**$ 986,900**	**$ 236,300**	**31.5%**
Expenses							
Personnel Expenses							
Salaries	436,500	446,000	9,500	2.2%	478,300	$ 41,800	9.6%
Payroll Taxes			-			-	
Benefits			-			-	
Retirement Costs			-			-	
Total Personnel Expenses	**$ 436,500**	**$ 446,000**	**$ 9,500**	**2.2%**	**$ 478,300**	**$ 41,800**	**9.6%**
Meeting Expenses							
WIRAB Meetings	$ 80,800	$ 65,000	$ (15,800)	-19.6%	$ 52,900	$ (27,900)	-34.5%
State Travel	28,200	32,000	$ 3,800	13.5%	30,200	$ 2,000	7.1%
Staff Travel	71,800	60,000	$ (11,800)	-16.4%	56,500	$ (15,300)	-21.3%
Conference Calls	3,200	3,200	$ -	0.0%	3,200	$ -	0.0%
Total Meeting Expenses	**$ 184,000**	**$ 160,200**	**$ (23,800)**	**-12.9%**	**$ 142,800**	**$ (41,200)**	**-22.4%**
Operating Expenses							
Consultants & Contracts	$ 100,000	$ 75,000	$ (25,000)	-25.0%	$ 100,000	$ -	0.0%
Office Rent	-	-	-	-	-	-	-
Office Costs	-	-	-	-	-	-	-
Professional Services	-	-	-	-	-	-	-
Miscellaneous	-	-	-	-	-	-	-
Depreciation	-	-	-	-	-	-	-
Total Operating Expenses	**$ 100,000**	**$ 75,000**	**$ (25,000)**	**-25.0%**	**$ 100,000**	**$ -**	**0.0%**
Total Direct Expenses	**$ 720,500**	**$ 681,200**	**$ (39,300)**	**-5.5%**	**$ 721,100**	**$ 600**	**0.1%**
Indirect Expenses	**$ 442,200**	**$ 468,300**	**$ 26,100**	**5.9%**	**$ 534,100**	**$ 91,900**	**20.8%**
Other Non-Operating Expenses	**$ -**	**$ -**	**$ -**	-	**$ -**	**$ -**	-
TOTAL BUDGET (B)	**$ 1,162,700**	**$ 1,149,500**	**$ (13,200)**	**-1.1%**	**$ 1,255,200**	**$ 92,500**	**8.0%**
CHANGE IN WORKING CAPITAL (=A-B)[1]	**$ (412,100)**	**$ (398,900)**	**$ 13,200**	-	**$ (268,300)**	**$ 143,800**	-
FTEs	5.00	5.00	-	0.0%	5.00	-	0.0%

[1] Fixed Assest included in Indirect Expenses.

Table 3. Budget Comparison, 2019 to 2020.

Statutory Assessments

WIRAB's proposed funding assessment of $986,300 is allocated $825,632 (84%) to the U.S. portion, $145,381 (15%) to the Canadian portion, and $15,288 (1%) to the Mexican portion of the Western Interconnection.

Key Assumptions

The WIRAB 2020 Business Plan and Budget is based on the following assumptions:

- There will be no significant expansion of FERC, NERC, or WECC responsibilities as a result of legislation or administrative actions.
- WIRAB will no longer provide advice to Peak Reliability and instead will monitor reliability coordination activities at the California ISO, the Southwest Power Pool, the Alberta Electric System Operator, and BC Hydro.
- WIRAB will hold two in-person meetings in 2020.
- WIRAB will organize and sponsor webinars and workshops on key reliability issues for WIRAB members, state and provincial representatives, industry representatives, and other interested stakeholders.
- WIRAB will attend all WECC Board of Directors and Member Advisory Committee (MAC) meetings.
- WIRAB will attend selected NERC meetings and workshops on relevant topics.
- WIRAB will annually visit with FERC in its offices.
- WIRAB will monitor all FERC business meetings.
- WIRAB will attend FERC technical conferences on reliability issues.

Section A – Statutory Activities

2020 Business Plan and Budget

Section A – Statutory Activities

WIRAB's advice to FERC, NERC, and WECC can be grouped into four categories that are appropriately funded under Section 215 of the FPA:

1. **Governance and Strategic Planning:** Section 215(j) of the FPA authorizes WIRAB to provide advice to FERC on the governance, strategic direction, budget and fees of WECC.

2. **Emerging Trends and System Risks:** WIRAB must maintain awareness of system conditions, emerging trends, and system risks in order to provide effective and technically sound advice regarding the strategic direction of FERC, NERC, and WECC. WIRAB also uses knowledge of emerging trends and risks to provide advice to WECC on reliability readiness activities and proactive compliance efforts. These activities are appropriately funded under Section 215(j) of the FPA.

3. **Periodic Reliability Assessments:** Section 215(g) of the FPA requires NERC to conduct periodic assessments of the reliability and adequacy of the bulk-power system. WECC assists NERC in performing this statutory activity. WIRAB works closely with WECC to improve reliability and resource adequacy assessments in the Western Interconnection.

4. **Reliability Standards and Proactive Enforcement:** Section 215(j) of the FPA authorizes WIRAB to provide advice to FERC on whether reliability standards are just, reasonable, not unduly discriminatory or preferential, and in the public interest. WIRAB works closely with WECC to identify emerging problems or conditions that should be considered in the course of drafting and voting on amendments to existing standards or the development of new standards. WIRAB also works closely with WECC to develop reliability readiness activities and to promote proactive compliance efforts.

   WIRAB's activities in each of these categories are described in the following subsections.

Governance and Strategic Planning

Section 215(j) of the FPA authorizes WIRAB to advise FERC on the governance, strategic direction, budget, and fees of WECC. The WIRAB staff engages with the WECC Board of Directors, standing committees, staff, Member Advisory Committees (MACs), and MAC work groups to monitor and evaluate the effectiveness and efficiency of governance and operations at WECC and to ensure that all "activities conducted pursuant to Section 215 are just, reasonable, not unduly discriminatory or preferential, and in the public interest."

The WIRAB staff attends meetings of the WECC Board of Directors, standing committees, MAC, and MAC work groups, and monitors developments related to WECC's organizational governance, strategic direction, and budget. The WIRAB staff also conducts monthly webinars to provide WIRAB Members, WECC's Class 5 Representatives (i.e., representatives of state and provincial governments), and other interested stakeholders with regular updates on current and upcoming activities at WECC and to review and develop WIRAB's written advice and guidance to the WECC Board of Directors. WIRAB provides WECC with independent expert advice on operational practices and performance, annual business plans and budgets, strategic plans, committee charters, proposed bylaw amendments, fees, and other matters. WIRAB and the WIRAB staff will continue to engage with WECC and to provide advice and recommendations to each organization as necessary.

Emerging Trends and System Risks

WIRAB staff engage in the following on-going activities in order to provide independent expert advice on emerging reliability trends and system risks:

Event Analysis and Situational Awareness:

Understanding important operational issues occurring today, as well as in the past, is key to ensuring reliability in the Western Interconnection. Event analysis and situational awareness topics need to be discussed in open and transparent forums that include both utility operators who see these types of issues on a day-to-day basis and thought leaders from diverse backgrounds. It is important to promote best practices and

lessons learned to ensure system operators have access to the tools and knowledge available to maintain a reliable grid in real-time.

WIRAB members and the WIRAB staff provide leadership by attending and participating in WECC's Operating Committee and Market Implementation Committee meetings, monitoring reliability coordination at the California ISO, the Southwest Power Pool, the Alberta Electric System Operator, and BC Hydro, and monitoring reliability activities at other forums outside of WECC and the Western Interconnection's four Reliability Coordinators. The WIRAB staff also provides periodic outreach webinars and panel sessions at in-person meetings to identify and discuss emerging trends and risks associated with event analysis and situational awareness with Western regulators, policy makers, and other stakeholders.

Distributed Solar PV Generation Resources:

By 2026, distributed solar photovoltaic (PV) nameplate capacity in the Western U.S. is projected to total more than 16,000 MW. Significant benefits of this trend include distributed solar PV generation's increased capacity, partial coincidence with peak power demand, potential for the provision of grid support services, and reductions in greenhouse gas and conventional air pollutant emissions. Several potential challenges are also associated with distributed solar PV capacity, including the potential for simultaneous disconnection of distributed solar PV generation systems with narrow tolerance ranges for frequency and/or voltage deviations, which may be triggered by and/or exacerbate deviations created by a system contingency such as a fault or the loss of a significant generator. Advanced inverters have a number of capabilities that can support system stability and support reliability in the event of a system contingency, such as providing frequency and/or voltage right through.

In addition to the trend of increasing distributed solar PV generation, there is a trend for retirement of synchronous generators such as coal-fired power plants in Western states. Non-synchronous generation technologies, specifically solar PV generation, have historically been regarded as unable to provide the grid support services commonly associated with synchronous generation resources, such as frequency support and voltage control. However, new power electronic technologies, which can be implemented through advanced inverters, enable non-synchronous generation to provide grid support more rapidly than synchronous generators.

WIEB and WIRAB are leading efforts by NREL to study potential reliability problems associated with increasing distributed solar PV generation in the Western Interconnection and to disseminate research findings and policy recommendations to regulators and policymakers in Western Interconnection states.

Expanding Market Operations:

Expanding market operations is a growing trend in the Western Interconnection. Western states have engaged in discussions on the potential creation of a regional ISO that would involve a multi-state grid using the California ISO's technology to coordinate and optimize electric systems across the states. The Energy Imbalance Market (EIM), which began operation in 2014, has been continuously expanding to include new participants. Additionally, the California ISO is developing plans to extend day ahead market services to EIM participants. Entities in the eastern part of the Western Interconnection continue to explore membership in an existing regional transmission organization. These market reforms could result in significant changes to system operations (e.g., transmission scheduling, congestion management) and create new reliability challenges and opportunities for the Western Interconnection.

The WIRAB staff monitors market reform efforts in the West and provides a forum for discussions about related issues such as the potential for a regional ISO, expansion of the EIM to new participants, extending the California ISO's day ahead market services to EIM participants, and opportunities for joining the SPP. The WIRAB staff monitors and participates in other forums that are exploring these issues, such as PUC and RTO meetings and workshops. Additionally, the WIRAB staff attends and participates in relevant WECC committee meetings and activities, such as those of the Market Interface Committee (MIC). WIRAB will continue to provide advice to WECC and to make recommendations as appropriate on reliability challenges and opportunities associated with expanding market operations.

Essential Reliability Services:

With the rapidly changing resource mix, the BES is becoming increasingly reliant on more variable, asynchronous generating resources. It is important that the electric utility industry examine emerging issues and ensure that policies and practices set today do not adversely impact reliability now or in the future. With the changing resource mix, some reliability services that are inherently provided by traditional

generation resources may not be available to the same extent in the future. However, policies and practices accounting for these emerging technologies can ensure grid reliability, even if the future grid operates differently.

WIRAB staff provides leadership and advice by attending, participating in and monitoring WECC's Reliability Assessment Committee, Operating Committee and Market Interface Committee meetings, , NERC's Reliability Issues Steering Committee, Operating Committee and Planning Committee meetings, FERC's Reliability Technical Conferences and other forums within the industry. WIRAB provides written advice to WECC and FERC on policies regarding the risks associated with the provision of essential reliability services. WIRAB staff also provides periodic outreach webinars and develops panel sessions for WIRAB's in-person meetings to discuss emerging trends and to inform Western policy makers and other interested stakeholders of the emerging risks associated with the changing resource mix and the provision of essential reliability services.

Periodic Reliability Assessments

WIRAB staff engage in the following on-going activities in order to provide guidance and independent expert advice on WECC's periodic reliability assessments:

Variable Energy Resources:

High priority reliability topics for the Western Interconnection include the increasing penetration of variable renewable resources, increasing retirements of baseload coal generation that would reduce inertia on the grid, and the growth of distributed energy resources that interface with the BES. WIRAB strives for high quality resource assessments that address the reliability implications of the changing resource mix in the Western Interconnection over a 10- to 20-year timeframe. Production cost modeling can identify economic dispatch of a potential new resource mix for every hour over a future year and identify critical hours of system stress. Power flow analysis then examines these critical stress hours for traditional reliability parameters. The integrated use of production cost modeling and power flow analysis will be an essential tool for future reliability assessments of the Western Interconnection.

WIRAB monitors, advises, and participates in WECC's Reliability Assessment Committee to promote improved reliability assessments of the Western Interconnection. WIRAB will encourage and support the RAC in its efforts to integrate WECC's data and modeling capability to perform roundtrip reliability assessments that combine power flow analysis and production cost modeling. WIRAB will also monitor, engage, and communicate findings on leading research about the integration of variable energy resources into the Western Interconnection, such as the work of NERC's Inverter-Based Resource Performance Joint Task Force. Further, WIRAB staff monitors and engages with the National Renewable Energy Laboratory (NREL), the Lawrence Berkeley National Laboratory (LBNL), the Energy Systems Integration Group (ESIG), the California ISO, and other researchers investigating the flexibility and reliability of the power system to integrate higher levels of renewable energy. WIRAB also provides outreach to Western states and provinces on the policy implications associated with new research.

Gas-Electric Interdependencies:

The North American power sector's reliance on natural gas for electric generation has grown significantly. Low natural gas prices, environmental regulations, and improving technologies have all contributed to rapid and sustained investment in new gas-fired power plants across the U.S. The natural gas and electricity industries evolved independently but are now inextricably interdependent. In the West, issues surrounding the Aliso Canyon natural gas storage field in southern California highlighted these interdependencies. In response to growing concerns about electric reliability, both FERC and NERC directed focused inquiries into issues related to gas-electric coordination, including NERC's assessment of single points of disruption.

In 2014, WIRAB's sister organization, WIEB, commissioned a Western-Interconnection-wide assessment of gas-electric interdependencies. Phase 1 of the study assessed natural gas infrastructure. Phase 2 of the study assessed short term operational flexibility. In 2017-2018, WIRAB staff participated in WECC's Gas and Electric Interface Study, which analyzed potential vulnerabilities between the gas sector and the electric sector in the Western Interconnection. WIRAB members and the WIRAB staff continue to work with WIRAB's partners in the Western Interconnection to

assess the adequacy, security, and risks associated with natural gas infrastructure and its ability to reliably meet evolving BES needs.

Reliability Standards and Proactive Enforcement

WIRAB staff engage in the following on-going activities in order to provide independent expert advice on the development and proactive enforcement of reliability standards:

Reliability Standards:

NERC reliability standards were created to provide minimum requirements for planning and operating the electric grid. The compliance and enforcement of these reliability standards ensures there is oversight and accountability of BES owners and operators and that system-wide reliability is maintained. It is important that reliability standards are strict enough to guarantee that system reliability is maintained, but flexible enough to respond to the changing industry. It is important to develop and review reliability standards to ensure they effectively preserve reliability while not being overly burdensome on the entities required to comply.

WIRAB staff provides independent expert advice on the development and proactive enforcement of reliability standards by contracting with subject matter experts with direct knowledge of the efficacy of reliability standards and the burden of compliance on regulated entities. WIRAB staff attends, participates and/or monitors WECC's Operating Committee meetings, WECC's Standards Committee meetings, NERC's standard development process and other industry forums. When necessary, WIRAB provides written advice to WECC, NERC and FERC on the implementation of specific standards within the Western Interconnection. WIRAB staff also conducts periodic outreach webinars and panel sessions at in-person meetings to lead discussions on emerging trends and risks associated with enforceable reliability standards and to inform Western policy makers and other stakeholders on these issues.

Physical Security and Cybersecurity:

Physical security and cybersecurity of the electric grid are of great concern. Until recent years, physical and cyber security incidents were confined to other sectors. Recently, however, physical incidents (including two incidents at a California substation)

and cyber incidents (including a late 2015 incident in the Ukraine that left one-quarter of a million customers without power) have impacted the power sector.

WIRAB has monitored incidents that have compromised the physical security and cybersecurity of the grid for several years. In 2014, 2015, and 2017, WIRAB conducted webinars on the physical security and/or cybersecurity of the grid. In addition, WIRAB has monitored NERC's Critical Infrastructure Protection (CIP) standards. As appropriate, WIRAB will provide updates on CIP standards during its Monthly Teleconference with WIRAB members.

Section B – WIRAB Supplemental Financial Information

2020 Business Plan and Budget

Section B – Supplemental Financial Information

Working Capital Reserve

WIRAB projects it will have a working capital reserve of $545,700 on December 31, 2019, as compared to a desired working capital reserve at December 31, 2020, of $277,400. The surplus working capital reserve results in a $268,300 reduction in WIRAB's funding requirement for 2020.

In its 2018 Business Plan and Budget, WIRAB changed its reserve policy to stabilize statutory assessments while reducing its surplus financial reserve over several budget cycles. WIRAB reduced its working capital reserve from $1,368,238 on December 31, 2017 to $1,068,456 on December 31, 2018 and is projecting a balance of $545,700 on December 31, 2019. The desired working capital reserve for December 31, 2020 is $277,400 or 22% of WIRAB's proposed budget for 2020.

WIRAB is targeting a working capital reserve equal to 20% of budgeted expenses beginning in 2021. The higher reserves in 2020 are intended to stabilize the change in assessments during the transition from the period of surplus reserves. Table B-1 shows WIRAB's analysis of its working capital reserves.

WIRAB - Working Capital Reserve Analysis 2019-2020	
STATUTORY	
Beginning Working Capital Reserve (Deficit), December 31, 2018	944,599
Plus: 2019 Funding (from LSEs or designees)	750,000
Plus: 2019 Other funding sources	600
Minus: 2019 Projected expenses & capital expenditures	(1,149,500)
Projected Working Capital Reserve (Deficit), December 31, 2019	**545,700**
Desired Working Capital Reserve, December 31, 2020[1]	277,400
Minus: Projected Working Capital Reserve, December 31, 2019	(545,700)
Increase(decrease) in funding requirement to achieve Working Capital Reserve	(268,300)
2020 Expenses and Capital Expenditures	1,255,200
Less: Penalty Sanctions[2]	0
Less: Other Funding Sources	(600)
Adjustment: To achieve desired Working Capital Reserve	(268,300)
2020 NERC Assessment	986,300

[1] Desired working capital reserve is 25 percent of budgeted expenses.

[2] Penalty sanctions are not applicable to WIRAB.

Table B-1. Working Capital Reserve Analysis 2019 – 2020.

Budget Projections for 2020-2022

WIRAB - Statement of Activities and Change in Working Capital 2020 Budget & 2021 and 2022 Projections							
STATUTORY							
	2020 Budget	**2021 Projection**	**Variance 2021 Projection v 2020 Budget Over(Under)**	**% Change**	**2022 Projection**	**Variance 2022 v 2021 Projections Over(Under)**	**% Change**
Funding							
WIRAB Funding							
Assessments	$ 986,300	$ 1,281,900	$ 295,600	30.0%	$ 1,355,100	$ 73,200	5.7%
Penalty Sanctions	-	-	-		-	-	
Total WIRAB Funding	**$ 986,300**	**$ 1,281,900**	**$ 295,600**	**30.0%**	**$ 1,355,100**	**$ 73,200**	**5.7%**
Membership Dues	-	-	-		-	-	
Testing Fees	-	-	-		-	-	
Services & Software	-	-	-		-	-	
Workshops	-	-	-		-	-	
Interest	600	600	$ -	0.0%	600	$ -	0.0%
Miscellaneous	-	-	-		-	-	
Total Funding (A)	**$ 986,900**	**$ 1,282,500**	**$ 295,600**	**30.0%**	**$ 1,355,700**	**$ 73,200**	**5.7%**
Expenses							
Personnel Expenses							
Salaries	478,300	497,400	19,100	4.0%	517,300	$ 19,900	4.0%
Payroll Taxes			-			-	
Benefits			-			-	
Retirement Costs			-			-	
Total Personnel Expenses	**$ 478,300**	**$ 497,400**	**$ 19,100**	**4.0%**	**$ 517,300**	**$ 19,900**	**4.0%**
Meeting Expenses							
WIRAB Meetings	$ 52,900	$ 54,500	$ 1,600	3.0%	$ 56,100	$ 1,600	2.9%
State Travel	$ 30,200	$ 31,100	$ 900	3.0%	$ 32,000	$ 900	2.9%
Staff Travel	$ 56,500	$ 58,200	$ 1,700	3.0%	$ 59,900	$ 1,700	2.9%
Conference Calls	$ 3,200	$ 3,300	$ 100	3.1%	$ 3,400	$ 100	3.0%
Total Meeting Expenses	**$ 142,800**	**$ 147,100**	**$ 4,300**	**3.0%**	**$ 151,400**	**$ 4,300**	**2.9%**
Operating Expenses							
Consultants & Contracts	$ 100,000	$ 100,000	$ -	0.0%	$ 100,000	$ -	0.0%
Office Rent	-	-	-	-	-	-	-
Office Costs	-	-	-	-	-	-	-
Professional Services	-	-	-	-	-	-	-
Miscellaneous	-	-	-	-	-	-	-
Depreciation	-	-	-	-	-	-	-
Total Operating Expenses	**$ 100,000**	**$ 100,000**	**$ -**	**0.0%**	**$ 100,000**	**$ -**	**0.0%**
Total Direct Expenses	**$ 721,100**	**$ 744,500**	**$ 23,400**	**3.2%**	**$ 768,700**	**$ 24,200**	**3.3%**
Indirect Expenses	**$ 534,100**	**$ 555,400**	**$ 21,300**	**4.0%**	**$ 577,700**	**$ 22,300**	**4.0%**
Other Non-Operating Expenses	**$ -**	**$ -**	**$ -**	-	**$ -**	**$ -**	-
TOTAL BUDGET (B)	**$ 1,255,200**	**$ 1,299,900**	**$ 44,700**	**3.6%**	**$ 1,346,400**	**$ 46,500**	**3.6%**
CHANGE IN WORKING CAPITAL (=A-B)[1]	**$ (268,300)**	**$ (17,400)**	**$ 250,900**	**-**	**$ 9,300**	**$ 26,700**	**-**
FTEs	5.00	5.00	-	0.0%	5.00	-	0.0%

[1] Fixed Assest included in Indirect Expenses.

Table B-2. Budget 2020 Compared with 2020-2022 Projections.

WIRAB projects a 3.6% increase to its annual budgets in 2021 and 2022. These increases reflect expected cost-of-living adjustments to personnel expenses for employees working in Denver, Colorado and increased costs for meetings and travel.

Section C – Non-Statutory Activities

2020 Business Plan and Budget

Section C – Non-Statutory Activities

WIRAB does not engage in non-statutory activities.

Section D – Additional Consolidated Financial Statements

2020 Business Plan and Budget

Section D – Additional Consolidated Financial Statements

Statement of Financial Position

Table D-1 provides WIRAB's Statement of Financial Position as of the following dates:

- As of June 30, 2018, per audit
- As of December 31, 2019, projected
- As of December 31, 2020, as budgeted

WIRAB - Statement of Financial Position			
STATUTORY			
	As of June 30, 2018 (Audit)	As of December 31, 2019 (Projected)	As of December 31, 2020 (Budgeted)
Assets			
Cash and Investments	$ 1,369,826	$ 545,700	$ 277,400
Total Assets	**$ 1,369,826**	**$ 545,700**	**$ 277,400**

Table D-1. Statement of Financial Position, Three-Year Comparison

Appendix A Organization Chart

The WIRAB Organization Chart is shown below.