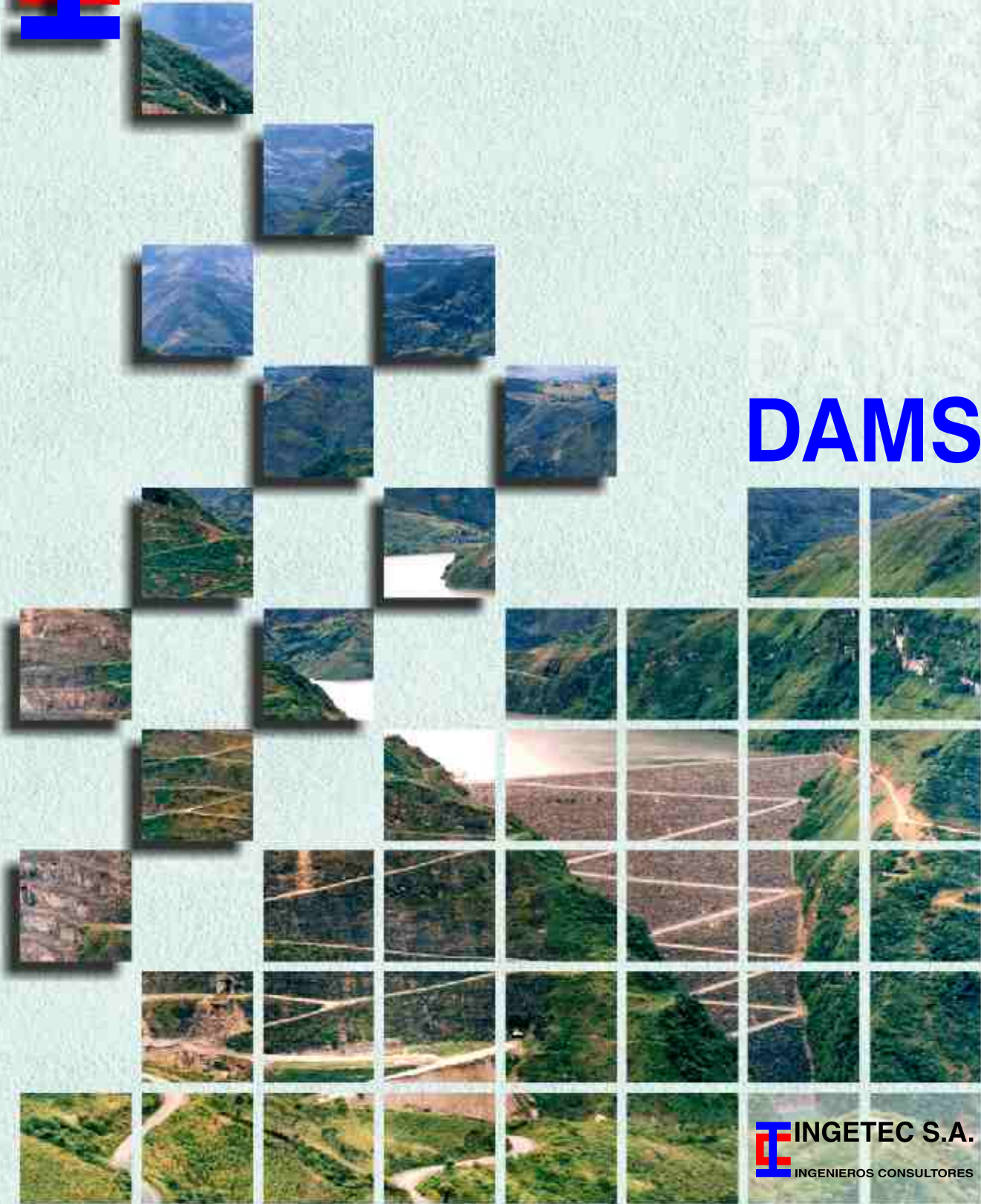


INGETEC S.A.



DAMS



ICONTEC

MIEMBRO DE LA ORGANIZACIÓN INTERNACIONAL - ISO
MEMBER OF THE INTERNATIONAL ORGANIZATION FOR STANDARDIZATION - ISO



CERTIFICADO DE GESTIÓN DE LA CALIDAD
CERTIFICATE OF QUALITY MANAGEMENT

ICONTEC certifica que el sistema de calidad de:
ICONTEC certifies that the quality system of:

INGETEC S.A.

Carrera 6 30A-30, Bogotá D.C.

ha sido evaluado y aprobado con respecto a la norma internacional:
has been assessed and approved based on the international quality standard:

ISO 9001:2000 - NTC-ISO 9001:2000

Este Certificado es aplicable a las siguientes actividades:
This certificate is applicable to the following activities:

Consulting services covering studies and designs for civil and electromechanical engineering and environmental projects, construction supervision of civil and electromechanical engineering projects, environmental supervision, supervision of studies and designs for civil, electrical and telephone engineering projects, supervision of highways in concession during operation, management and financial supervision of projects, construction management and consultancy during construction of civil and electromechanical engineering projects

Esta aprobación está sujeta a que el sistema de calidad se mantenga de acuerdo con los requisitos establecidos en la norma, lo cual será verificado por el ICONTEC
This approval is subject to the maintenance of the quality system according to the requirements established in the above mentioned standard, which will be verified by ICONTEC.

Certificado N° 085-1
Certificate N°

Fecha de Aprobación: Approval date:	1998 04 22	Fecha Última Modificación: Last modification date:	2004 12 16
Fecha de Renovación: Renewal date:	2005 11 26	Fecha de Vencimiento: Expiration date:	2006 11 26

Director Ejecutivo
Executive Director

ICONTEC es un organismo de Certificación acreditado por:
ICONTEC is a certification body accredited by:





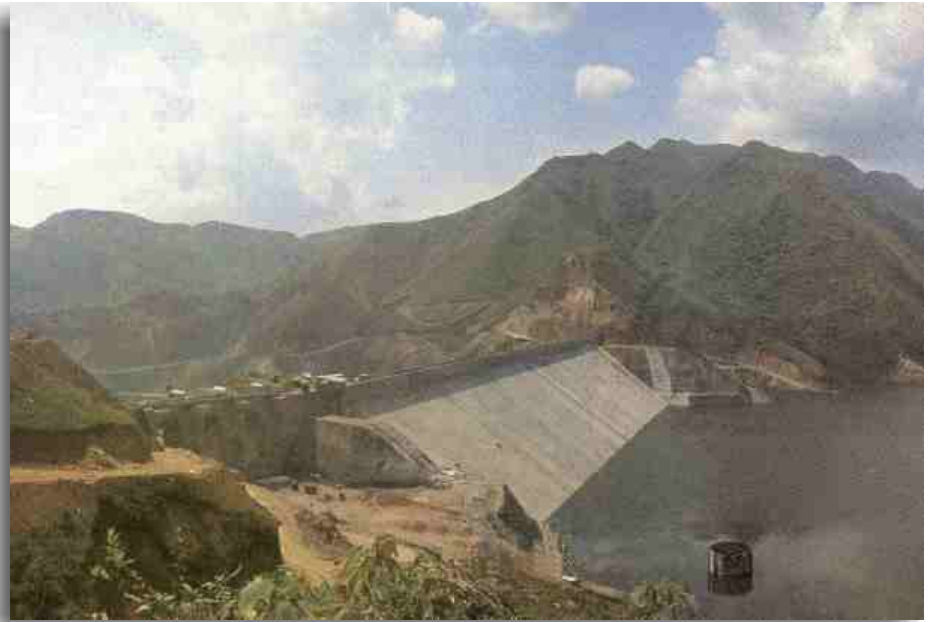
INGETEC S.A. has an outstanding experience in the field of dams. Projects are located in Colombia and other South American Countries. The firm has been involved in studies and designs at different levels, as well as supervision and technical advisory during construction of such projects.

INGETEC S.A credits its experience with 32 dams, with a total fill volume of about 200 million m³. Among them, the third and fourth highest in the world: of the central core rockfill type, Guavio and La Esmeralda; as well as the highest Roller Compacted Concrete Dam (Miel I, under construction) and the highest Concrete Face Rockfill Dam (Antamina, under construction) Seven of these dams have a height greater than 200m; five between 150 m and 200 m; 11 between 100 and 150m, and 14 less than 100 m. The studies and jobs in this field include concrete face dams, rockfill dams with central core, embankment dams and roller compacted concrete dams. For these dams, the firm completed pre-feasibility and feasibility studies, bidding documents, design, supervision, and technical advisory during construction.

A brief review of some of the dams where INGETEC S.A has participated follows.

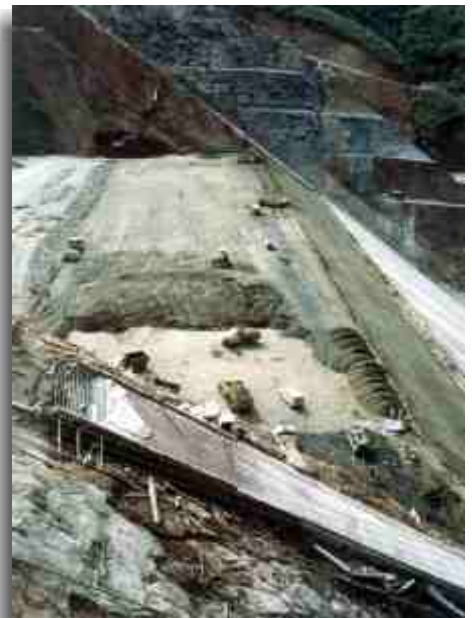
Concrete Face Rockfill Dams

Salvajina Dam (1986)



INGETEC S.A accomplished the design, technical and contractual supervision during the construction of the dam, for Corporación Autónoma Regional del Valle del Cauca - CVC.

The dam is part of the regulation project of the Cauca River. It is 154 m high, 426 m long at the crest; and has a rockfill volume of 4 500 000 m³.



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Antamina Dam (Perú, 1999-2000)

Concrete Face Rockfill Dams

(Under Construction)



INGETEC S.A., in association with GOLDER ASSOCIATES, is undertaking, for Compañía Minera Antamina, the design and technical supervision during construction for the Antamina tailings dam.

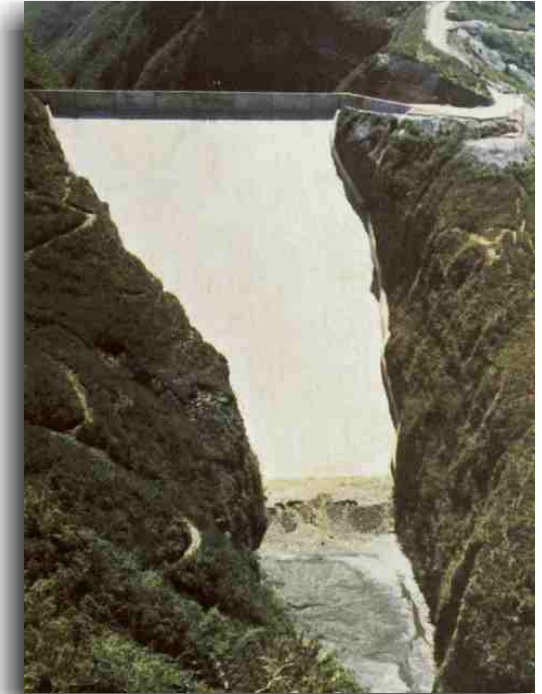
The dam has a height of 209 m, a crest length of 1050 m and rockfill volume of 23 000 000 m³. When finished it will be the highest Concrete Face Rockfill Dam in the world.



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Concrete Face Rockfill Dams

Golillas Dam (1978)



INGETEC S.A. carried out, for the Empresa de Acueducto y Alcantarillado de Bogotá - the design, and the technical supervision during construction.

The Dam is part of the Chingaza System, the main water supply source for the city of Santa Fe de Bogotá. It is 127 m high, 110 m long at the crest; and has a rockfill volume of 1 300 000 m³.

El Pescador Dam (2000-2002)

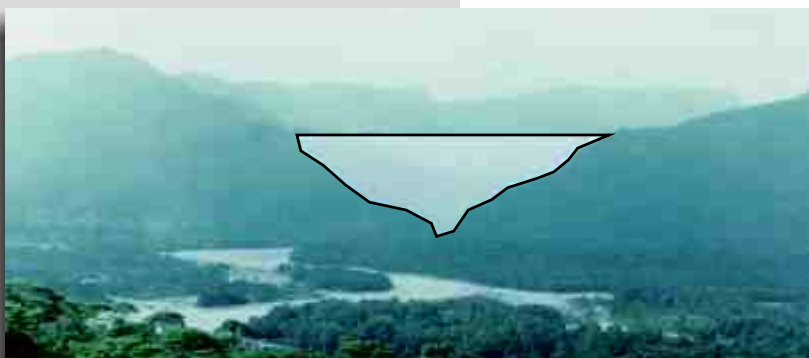


INGETEC S.A. carried out for Corporación Autónoma Regional del Valle del Cauca CVC, the revision and modification of the design, and is performing technical and contractual supervision during construction for El Pescador Dam, to storage water for regional water supply.

(Under Construction)

The Dam is 42.5 m high, 200 m long at the crest; and has a rockfill volume of 211 000 m³.

Andaquí Dam (1994-1997)



INGETEC S.A. completed for ISAGEN S.A. the pre-feasibility and feasibility studies for the Hydroelectric Development of the Caquetá River. The study included the design and evaluation of 10 possible hydroelectric developments.

The Andaquí Dam, the most attractive alternative, is 206 m high, 800 m long at the crest; and has a rockfill volume of 16 000 000 m³.

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Alpamarca Dam (2000-2001)

Concrete Face Rockfill Dams

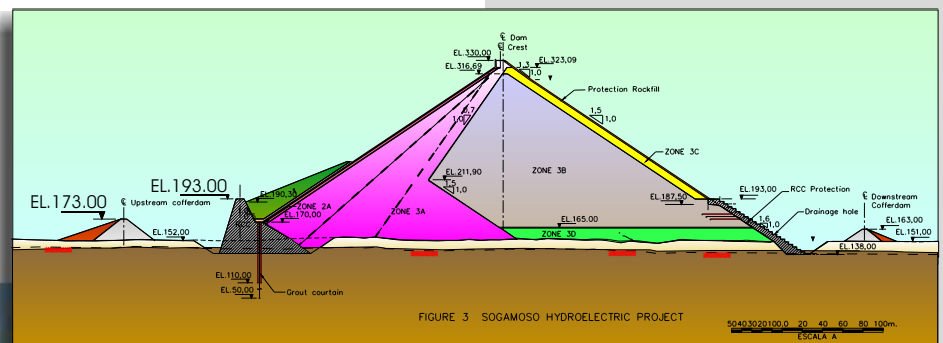
INGETEC S.A. in association with Golder Associates Peru, is currently performing for CMH mining company the design and construction supervision of the Alpamarca Tailings Dam. The dam will have a concrete barrier in the upstream face and the main fill shall be composed by gravel. When finished, the dam will be 95 m high, with a crest 120 m long and a rockfill volume of 1 500 000 m³.



Sogamoso Dam (1994-1996)

INGETEC S.A. undertook for Interconexión Eléctrica S.A. - ISA, the design of the dam of the Sogamoso Hydroelectric Project.

The dam has a height of 191m, a crest length of 310 m and rockfill volume of 6 600 000 m³.



Concrete Face Rockfill Dams

El Quimbo Dam (1996-1997)



INGETEC S.A., as leader of a joint venture, undertook for Central Hidroeléctrica de Betania the feasibility studies of the Quimbo Dam.

The concrete face rockfill dam, has a height of 154 m, a 425 long crest and a rockfill volume of 6,500,000 m³.

Porce III Dam (1996-1997)



INGETEC S.A. carried out for Empresas Publicas de Medellin (EPM) the feasibility studies of the Porce III Concrete Face Dam.

The dam has a height of 140 m, a 400 m long crest and a rockfill volume of 3,800,000 m³.

Paute-Mazar Dam (Ecuador 1992)



(In bidding process)

INGETEC S.A., in a joint venture, per-formed the design revision of the Mazar Hydroelectric Development in the Paute River.

The dam has a height of 191m, a crest length of 310 m and rockfill volume of 6 600 000 m³.

El Platanal Dam



INGETEC S.A., is currently providing technical assistance for the design of "El Platanal Dam" in Peru. This Concrete Face Rockfill Dam, will be 230 m high and will have an approximate rockfill volume of 5,000,000 m³.

Central Core Rockfill Dams



La Esmeralda Dam (1976)



INGETEC S.A undertook for Empresa de Energía de Bogotá EEB the pre-feasibility and feasibility studies, the design and technical and contractual supervision during construction of the dam for the Chivor Hydroelectric Project.

The Esmeralda Dam has a height of 237 m, a crest length of 310 m, and a rockfill volume of 11 500 000 m³.

Calima Dam (1964)



INGETEC S.A. in a joint venture accomplished for Corporación Autónoma Regional del Valle del Cauca CVC, the design and technical and contractual supervision during construction of the dam for the Calima Hydroelectric Project.

The dam has a height of 115 m, a crest length of 240 m and rockfill volume of 2 800 000 m³.

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Central Core Rockfill Dams

Alberto Lleras Dam (Guavio)(1992)



INGETEC S.A carried out for Empresa de Energía de Bogotá EEB the pre-feasibility and feasibility studies, the design and technical supervision during construction of the dam for the Guavio Hydroelectric Project.

The Dam has a height of 243 m, The crest is 390m long, and has a rockfill volume of 17 100 000 m³.



Salve-Faccha Dam (Ecuador-1999)

INGETEC S.A., undertook for la Empresa Municipal Alcantarillado y Agua Potable de Quito-EMAP, the revision and modification of the designs of the dam, that is part of the water sup.



The Dam has a height of 39 m, a 210 m long crest and a rockfill volume of 260 000 m³.



Antamina Dam D. (2000)

INGETEC S.A., in association with Golder Associates, undertook, for Compañía Minera Antamina, the supervision during construction and quality assurance of this dam used for fresh water supply.

The dam has a height of 32.5 m and a 270 m long crest.



Central Core Rockfill Dams



Chisacá Dam Raising (1990)



INGETEC S.A. undertook, for Empresa de Acueducto y Alcantarillado de Bogotá, the design works and technical supervision for the raising of the Chisaca Dam.

The completed dam has a height of 40,5 m, and a crest length of 302 m.

Golillas Dike (1978)



INGETEC S.A. carried out, for Empresa de Acueducto y Alcantarillado de Bogotá, the final design and construction supervision of the Golillas Dike, as part of the Chingaza project.

The dam has a height of 42 m, a 284 m long crest and a rockfill volume of 500 000 m³.



Central Core Rockfill Dams

La Copa Dam (1991)



INGETEC S.A. undertook for the Instituto de Hidrología, Meteorología y Adecuación de Tierras, HIMAT, the technical and contractual supervision during construction of the dam for irrigation and water supply for the city of Tunja.

The Dam has a height of 34 m, a 180 m long crest and a rockfill volume of 280 000 m³.

La Regadera Dam (1997)



INGETEC S.A. completed for Empresa de Acueducto y Alcantarillado de Bogotá EAAB the construction designs as well as technical and contractual supervision for the seismic reinforcement for La Regadera Dam.

The Dam has a height of 37 m, a 358 m long crest and a rockfill volume of 544 000 m³.



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Central Core Rockfill Dams



El Hato Dam (1993)



INGETEC S.A. undertook, for Corporación Autónoma Regional de Cundinamarca, CAR, the technical and contractual supervision during construction of the dam, for the irrigation project of the River Ubaté.

The Dam has a height of 35 m, a 47 m long crest, and has a rockfill volume of 44 000 m³.

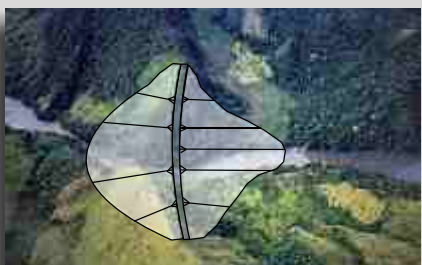
La Playa Dam (1997-1999)



INGETEC S.A. completed for Empresa de Acueducto y Alcantarillado de Bogotá EAAB the pre- feasibility, feasibility studies and final design for the construction of the dam for the water supply system of the city of Bogotá.

The Dam has a height of 90 m, a 350 m long crest, and has a rockfill volume of 1 500 000 m³.

Guaicaramo Dam (1980-1983)



INGETEC S.A. completed for Empresa de Energía de Bogotá, EEB, the pre- feasibility and feasibility studies for the dam of the Upía Hydroelectric Project.

The Dam has a height of 230 m, 850 m long crest and rockfill volume of 33 300 000 m³.

Valdivia Dam (1980-1984)

INGETEC S.A. undertook for Empresas Públicas de Medellín EPM the pre- feasibility and feasibility studies for the dam of the Nechí Hydroelectric Project

The Dam has a height of 235 m, a 810 m long crest and rockfill volume of 22 000 000 m³.

Cañafisto Dam (1983-1986)

(Not built)

INGETEC S.A. completed for Interconexión Eléctrica S.A. ISA the design of the dam for Cañafisto Hydroelectric Project.

The Dam has a height of 110 m, a 603 m long crest, and has a rockfill volume of 13 800 000 m³ with an 80 m deep foundation cutoff.

San Rafael Dam (1996)



INGETEC S.A. Undertook for Empresa de Acueducto y Alcantarillado de Bogotá EAAB the design and the technical supervision during construction of the dam for the water supply system for Bogotá.

The Dam has a height of 60 m, a 620 m long crest, and has a rockfill volume of 2 750 000 m³.

Sesquilé Dam (1962; 1988-1989)



INGETEC S.A. carried out, for Empresa de Energía de Bogotá, EEB, the design and the technical and contractual supervision during construction of the Sesquilé dam, and the seismic retrofitting, adding stabilizing berms from barges after the reservoir was operating.

The dam is a key feature of the Bogotá basin development.

The Dam has a height of 42 m, a 360 m long crest and a rockfill volume of 2 000 000 m³.

The retrofitting with berms has a volume of a 1 100 000 m³ and is, 20m high.

Embankment Dams



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Roller Compacted Concrete Dams

Miel I Dam (1997-2002)



(Under construction)

INGETEC S.A. is currently executing for Hidromiel S.A. technical and contractual supervision during construction of the Miel I. Hydroelectric Project.

The Dam has a height of 188 m, a 200 m long crest, and has a fill volume of 1 730 000 m³. When finished it will be the highest RCC dam in the world.



Miel II Dam (1989-1992)



INGETEC S.A. completed for Hidromiel S.A. the designs for the dam of the Hydroelectric Project. Miel II.

The Dam has a height of 141m, a 238 m long crest, and has a rockfill volume of 730 000 m³.

Guarínó Dam (1989-1992)



INGETEC S.A. carried out for Hidromiel S.A. the design of the Guarínó Dam, as part of Miel II Hydroelectric Project.

This dam has a height of 71,50 m, a 140 m long crest and a volume of 160,000 m³.

Sopladora y Cardenillo Dams (Ecuador 1990-1992)

INGETEC S.A. carried out, for Instituto Ecuatoriano de Electricidad, INECEL, the pre-feasibility and feasibility studies for the Hydroelectric Development of the River Paute.

This development includes the Sopladora Dam (80 m high, a 200 m long crest and a rockfill volume of 280 000 m³) and the Cardenillo Dam (20 m high, a 90m long crest and a rockfill volume of 80 000 m³).

Conventional Concrete Dams

Tunjita Dam (1979-1982)



INGETEC S.A. Undertook for Interconexión Eléctrica S.A., as part of the Chivor Project, the design and construction supervision of the Tunjita Diversion dam.

The concrete arch dam has a height of 23 m, a 49 m long crest and a concrete volume of 665 m³.



Río Negro Dam (1979-1982)



INGETEC S.A. carried out for Interconexión Eléctrica S.A., as part of the Chivor Project, the design and construction supervision of the Río Negro diversion dam.

The concrete arch dam has a height of 20 m, a 21.3 m long crest and a concrete volume of 362 m³.



Río Frio Dam (1994-1996)

INGETEC S.A. carried out for Compañía de electrificación de Tuluá, the construction supervision and technical advisory of the Riofrio II project.

The concrete gravity dam of the project has a height of 8,5 m, a 60 m long crest and a concrete volume of 2 722 m³.



Name of the Project	Location	Client	Period	Project Description	Height m.	Crest Length m.	Fill Volume m3	Fill Type	Services Provided by Ingetec S.A.
A. ROCKFILL DAMS WITH CONCRETE FACE									
Salvajina	Valle Colombia	Corporación Autónoma Regional del Valle del Cauca - (CVC).	1973-1975	Multipurpose Project Cauca River regulation Medium Flow: 1143 m3/s Reservoir Volume. 906 Mm3 Installed Capacity. 270 MW	154	426	4.513.000	Gravels and sandstone fragments	Bidding Design and supervision during construction Participation: 100%
Gollillas	Bogotá Colombia	Empresa de Acueducto y Alcantarillado de Bogotá (EAAB).	1969-1975	Water Supply for the City of Santafe de Bogotá Chuzza River, Max. Flow. 22 m3/s Reservoir volume. 252 Mm3.	127	110	1.293.000	Gravels sandstone, fragments and siltstone	Bidding Design and supervision during construction Participation: 100%
Sogamoso	Santander Colombia	Interconexión Eléctrica S.A. ISAGEN	1994-1996	Hidroelectric Development Rio Sogamoso medium flow: 487 m3/s Reservoir Volume. 3029 Mm3 Installed Capacity. 850MW	191	310	6.600.000	Gravels and sandstone fragments	Bidding Design Participation: 100%
Paute - Mazar	Azuai Ecuador	Instituto Ecuatoriano de Electricidad. (INECEL).	1988-1992	Hidroelectric Development Paute River : Medium Flow 123 m3/s Reservoir Volume. 413 Mm3 Installed Capacity. 1700 MW	171	310	4.500.000	Metavolcanic	Final review of the design Participation: 40% Leader of consortium
Toachi - Pilatón	Pichincha Ecuador	Instituto Ecuatoriano de Electricidad. (INECEL).	1990-1991	Hidroelectric Development Toachi River medium flow 30 m3/s Reservoir volume 139 Mm3 Installed Capacity 300 MW	148	370	5.200.000	Metavolcanic	Final review of the design Participation: 100%
Quimbo	Huila Colombia	Central Hidroeléctrica de Betania S.A.	1996-1997	Hidroelectric Development Rio Magdalena : Flujo medio 250 m3/s Reservoir volume 260 Mm3 Installed capacity 450 MW	154	425	6.500.000	Gravels	Feasibility Studies Participation: 70%
Porce III	Antioquia Colombia	Empresas Públicas de Medellín (EPM)	1996-1997	Hidroelectric Development Rio Porce : Flujo medio 158 m3/s Reservoir volume 250 Mm3 Installed Capacity. 846 MW	140	400	3.800.000	Schist	Feasibility Studies Participation: 65%
Andaqui	Caquetá Colombia	ISAGEN S.A "E.S.P"	1994-1997	Hidroelectric Development Rio Caquetá : Flujo medio 400 m3/s Volumen de embalse 550 Mm3 Installed Capacity. 2100 MW	206	800	16.100.000	Granite and gravel	Pre -Feasibility and feasibility Studies Participation: 100%
Antamina	Perú	Compañía Minera Antamina	1999-2000	Mining Tailings Disposal	209	1050	23.000.000	Limestone	Bidding Design and technical advisory during construction Associated with Golder As.
El Pescador	Valle del Cauca Colombia	Corporación Autónoma Regional del Valle del Cauca (CVC)	2000-2002	Water supply for Bolivar, Roldanillo, La Unión, Toro, Zarzal, La Victoria, Obando	42,5	200	211.000	Diabase	Review and modification of the design Supervision during construction
Alpamarca	Trujillo Peru	Compañía Minera Horizonte CMH	2000-2001	Mining Tailings Disposal	95	120	1.500.000	Gravels	Review of the design Supervision during construction and project management
Platanal	Peru		2000-	Hidroelectric Development	230		5.000.000		Assistance during design
B. ROCKFILL DAMS WITH CENTRAL CORE									
Calima	Valle del Cauca Colombia	Corporación Autónoma Regional del Valle del Cauca (CVC)	1961-1964	Hidroelectric Development Rio Calima	115	240	2.780.000		Bidding Design and supervision during construction
Chivor	Boyacá Colombia	Empresa de Energía de Bogotá. (EEB).	1960-1970	Hidroelectric Development Batá River medium flow 160 m3/s Reservoir volume 758 Mm3 Installed Capacity 1000 MW	237	310	11.483.000	Cuarzo Caliza Argillita	Pre -Feasibility and feasibility Studies Bidding Designs Participation: 100%
Guavio Alberto Lleras Camargo	Cundinamarca Colombia	Empresa de Energía de Bogotá. (EEB).	1976-1979	Hidroelectric Development Guavio River medium flow 176 m3/s Reservoir Volume 970 Mm3 Installed Capacity 1600 MW	250	390	17.074.000	Fillite, argillite, quartz, limestone and sandstone	Pre -Feasibility and feasibility Studies Bidding Designs Participation: 100%
Upia	Casanare Colombia	Empresa de Energía de Bogotá. (EEB).	1980-1983	Hidroelectric Development Rio Upia 1120 m3/s Reservoir volume 9870 Mm3 Installed Capacity 1750 MW	230	850	33.260.000	Gravels and sandstone fragments	Pre -Feasibility and feasibility Studies Participation: 100%
B. ROCKFILL DAMS WITH CENTRAL CORE									
Lengupá	Boyacá Colombia	Empresa de Energía de Bogotá. (EEB).	1980-1982	Hidroelectric Development Lengupá River Max. flow: 168 m3/s Reservoir Volume 1090 Mm3 Installed Capacity 800 MW	215	660	14.610.000	Sandstone	Feasibility Studies Participation: 100%
Nechí	Antioquia Colombia	Empresas Públicas de Medellín (EPM).	1980-1984	Hidroelectric Development Nechi River Max. flow: 168 m3/s Reservoir Volume 993 Mm3 Installed Capacity 860 MW	235	810	22.000.000	Diabase	Pre -Feasibility and feasibility Studies Participation: 100%
Cañofisto	Antioquia Colombia	Interconexión Eléctrica S.A. (ISA).	1983-1986	Hidroelectric Development Cauca River Max. flow: 1050 m3/s Reservoir Volume 2940 Mm3 Installed Capacity 1800 MW	110	603	13.800.000	Diabase	Design Participation: 100%

Name of the Project	Location	Client	Period	Project Description	Height m.	Crest Length m.	Fill Volume m3	Fill Type	Services Provided by Ingetec S.A.
B. ROCKFILL DAMS WITH CENTRAL CORE									
Bucaramanga	Santander Colombia	Empresa de Acueducto de Bucaramanga	1996-1997	Water supply for the city of Bucaramanga Reservoir Volume 30 Mm3	65	260	600.000	Hornfels	Feasibility Studies and Construction Design
La Playa	Bogotá Colombia	Empresa de Acueducto y Alcantarillado de Bogotá (EAAB).	1997-1999	La Playa dam will form part of the system of water supply for the city of Bogotá Bogotá the year 2010	90	350	1.480.000	Alluvial Deposits	Feasibility Studies and Final Design Contractual Documents
Salve Faccha	Quito Ecuador	Empresa Municipal Alcantarillado y Agua Potable de Quito (EMAP)	1999	Salve Faccha Dams is part of Papallacta Project, the water supply system for the City of Quito	39	210	260.000	Basalt	Review and modification of the design Participation: 100%
La Copa	Boyacá Colombia	Instituto de Hidrología, Meteorología y Adecuación de Tierras . (HIMAT).	1987-1991	Irrigation and water Supply System	34	180	280.000	Sandstone Siltstone	Supervision during construction Participation: 100%
El Hato	Cundinamarca Colombia	Corporación Autónoma Regional (CAR).	1990-1993	Irrigation System	35	47	44.130	Sandstone	Supervision during construction Participation: 100%
Gollillas Dike (Chuzá)	Cundinamarca Colombia	Empresa de Acueducto y Alcantarillado de Bogotá (EAAB).	1987	Auxiliary dike for the Chuza Reservoir	42	284	540.000	Gravels sandstone, siltstone	Bidding Design and supervision during construction Participation: 100%
La Palma	Tolima Colombia	El Potrero Finca arrocera	1987	Auxiliary dike and irrigation structure and reservoir for 4500 ha	23	180	110.000	Alluvial Deposits	Supervision during construction Participation: 100%
Ruitoque	Santander Colombia	Urbanas S.A.	1992-1994	Two Auxiliary dikes and two reservoirs of 80000 and 190000 m3 respectively for water sports	16 y 22	40 y 60	22.000 y 70.000	Siltstone Sandstone	Final Review of Design Supervision during construction
C. EMBANKMENT DAMS									
Sesquíé Retrofit	Cundinamarca Colombia	Empresa de Energía de Bogotá. (EEB).	1960-1962	Water Supply for the City of Santafé de Bogotá Regulation of the Bogotá River Stabilization Berms	42 20	360	2.000.000 1.100.000	Siltstone, Sandstone	Bidding Designs Supervisión durante construcción
San Rafael	Bogotá Colombia	Empresa de Acueducto y Alcantarillado de Bogotá (EAAB).	1986-1992	Water Supply for the City of Santafé de Bogotá Reservoir Volume: 64 Mm3	59,5	620	2.750.000	Siltstone Sandstone	Design and Supervision during construction Participation: 100%
D. ROLLER COMPACTED CONCRETE DAMS									
Miel II	Caldas Colombia	Hidromiel S.A.	1989-1992	Hydroelectric Development La Miel flow 60 m3/s Reservoir Volume 460 Mm3 Installed Capacity 351 MW	141	238	730.000	RCC, agregados Hornfels, Schist	Design and Contractual Documents Participation: 100%
Guarino	Caldas Colombia	Hidromiel S.A.	1989-1992	Diversion of the Guarino River Miel II Hydroelectric Project	71,5	140	160.000	RCC, aggregates Hornfels, Schist	Final Design Participation: 100%
Sopladora y Cardenillo	Ecuador	Instituto Ecuatoriano de Electricidad (INECEL)	1990-1992	Hydroelectric Development Installed Capacity 600 MW	80 y 22	200 y 90	280.000 y 80.000	Schist Schist and quartzite	Pre - Feasibility and feasibility Studies
Miel I	Caldas Colombia	Hidromiel S.A.	1997-2002	Hydroelectric Development La Miel flow 84,3 m3/s Reservoir Volume 565 Mm3 Installed Capacity 375 MW	188	200	1.730.000	RCC aggregates Schist	Supervision during construction Participation: 100%
E. CONCRETE DAMS									
Tunjita	Boyacá Colombia	Interconexión Eléctrica S.A.	1979-1982	Diversion Dam . Concrete Arch La Esmeralda Reservoir	23	49	665	Concrete	Final Design Construction Supervision Participation: 100%
Río Negro	Boyacá Colombia	Interconexión Eléctrica S.A.	1979-1982	Diversion Dam- Concrete Arch La Esmeralda Reservoir	20	21,3	362	Concrete	Final Design Construction Supervision Participation: 100%
Río Frio	Valle Colombia	Compañía de electricidad de Tuluá	1994-1996	Gravity Dam Installed Capacity 10 MW	8,5	60	2.722	Concrete	Construction supervision Participation 100%

